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committed to the highest level of medical education. Kaplan has been working with the MCAT for over 50 years and our commitment to premed students is unflagging; in fact, Stanley Kaplan created this company when he had difficulty being accepted to medical school due to unfair quota systems that existed at the time. We stand now at the beginning of a new era in medical education. As citizens of this 21st-century world of healthcare, we are charged with creating a patient-oriented, culturally competent, cost-conscious, universally available, technically advanced, and research-focused healthcare system, run by compassionate providers. Suffice it to say, this is no easy task. Problem-based learning, integrated curricula, and classes in interpersonal skills are some of the responses to this demand for an excellent workforce—a workforce of which you'll soon be a part. We're thrilled that you've chosen us to help you on this journey. Please reach out to us to share your challenges, concerns, and successes. Together, we will shape the future of medicine in the United States and abroad; we look forward to helping you become the doctor you deserve to be. Alexander Stone Macnow, MD Department of Pathology and Laboratory Medicine Hospital of the University of Pennsylvania BA, Musicology—Boston University, 2008 MD—Perelman School of Medicine at the University of Pennsylvania, 2013 As the world's premier science and technology magazine, and the oldest continuously published magazine in the United States, Scientific American is committed to bringing the most important developments in modern science, medicine, and technology to our worldwide audience in an understandable, credible, and provocative format. Founded in 1845 and on the "cutting edge" ever since, Scientific American boasts over 175 Nobel laureate authors including Albert Einstein, Marie Curie, Francis Crick, Christiane Nüsslein-Volhard, Stanley Prusiner, and Richard Axel. Scientific American is a forum where scientific theories and discoveries are explained to a broader audience. Scientific American published its first international edition in 1890, and in 1979 was the first North American magazine published in the People's Republic of China. Today, Scientific American is published in 14 additional language editions. Scientific American is also a leading online destination ([www.ScientificAmerican.com](http://www.ScientificAmerican.com)), providing the latest science news and exclusive features to

millions of visitors each month. The knowledge that fills our pages has the power to spark new ideas, paradigms, and visions for the future. As science races forward, Scientific American continues to cover the promising strides, inevitable setbacks and challenges, and new medical discoveries as they unfold.

**Anatomy of the MCAT** Here is a general overview of the structure of Test Day:

- Chemical and Physical Foundations of Biological Systems
- Critical Analysis and Reasoning Skills (CARS)
- Lunch Break (optional)
- Biological and Biochemical Foundations of Living Systems
- Psychological, Social, and Biological Foundations of Behavior
- Satisfaction Survey (optional)

The structure of the four sections of the MCAT is shown below.

Section	Questions	Passage-based	Discrete	Score Range	What It Tests
Chemical and Physical Foundations of Biological Systems	44	30	15	118-132	General Chemistry: 30% Organic Chemistry: 15%
Critical Analysis and Reasoning Skills (CARS)	44	44	0	118-132	All questions are passage-based.
Biological and Biochemical Foundations of Living Systems	44	30	15	118-132	General Chemistry: 5% Organic Chemistry: 5%
Psychological, Social, and Biological Foundations of Behavior	44	44	0	118-132	All questions are passage-based.

and 15 are discrete (stand- Score between 118 and 132 What It Tests 375 minutes (6 hours, 15 minutes) Total Seat Time 447 minutes (7 hours, 27 minutes) 472 to 528

**Scientific Inquiry and Reasoning Skills** The AAMC has defined four Scientific Inquiry and Reasoning Skills (SIRS) that will be tested in the three science sections of the MCAT:

1. Knowledge of Scientific Concepts and Principles (35% of questions)
2. Scientific Reasoning and Problem-Solving (45% of questions)
3. Reasoning About the Design and Execution of Research (10% of questions)
4. Data-Based and Statistical Reasoning (10% of questions)

Let's see how each one breaks down into more specific Test Day behaviors. Note that the bullet points of specific objectives for each of the SIRS are taken directly from the Official Guide to the MCAT Exam; the descriptions of what these behaviors mean and sample question stems, however, are written by Kaplan.

**Skill 1:**

**Knowledge of Scientific Concepts and Principles** This is probably the least surprising of the four SIRS; the testing of science knowledge is, after all, one of the signature qualities of the MCAT. Skill 1 questions will require you to do the following:

- Recognize correct scientific principles
- Identify the relationships among closely related concepts
- Identify the relationships between different representations of concepts (verbal, symbolic, graphic)
- Identify examples of observations that illustrate scientific principles
- Use mathematical equations to solve problems

At Kaplan, we simply call these Science Knowledge or Skill 1 questions. Another way to think of Skill 1 questions is as “one-step” problems. The single step is either to realize which scientific concept the question stem is suggesting or to take the concept stated in the question stem and identify which answer choice is an accurate application of it. Skill 1 questions are particularly prominent among discrete questions (those not associated with a passage). These questions are an opportunity to gain quick points on Test Day—if you know the science concept attached to the question, then that’s it! On Test Day, 35% of the questions in each science section will be Skill 1. Here are some sample Skill 1 question stems: How would a proponent of the James-Lange theory of emotion interpret the findings of the study cited in the passage? Which of the following most accurately describes the function of FSH in the human menstrual cycle? If the products of Reaction 1 and Reaction 2 were combined in solution, the resulting reaction would form: Ionic bonds are maintained by which of the following forces?

**Skill 2: Scientific Reasoning and Problem-Solving** The MCAT science sections do, of course, move beyond testing straightforward science knowledge; Skill 2 questions are the most common way in which it does so. At Kaplan, we also call these Critical Thinking questions. Skill 2 questions will require you to do the following:

- Reason about scientific principles, theories, and models
- Analyze and evaluate scientific explanations and predictions
- Evaluate arguments about causes and consequences
- Bring together theory, observations, and evidence to draw conclusions
- Recognize scientific findings that challenge or invalidate a scientific theory or model
- Determine and use scientific formulas to solve problems

Just as Skill 1 questions can be thought of as “one-step” problems, many Skill 2 questions are “two-step”

problems, and more difficult Skill 2 questions may require three or more steps. These questions can require a wide spectrum of reasoning skills, including integration of multiple facts from a passage, combination of multiple science content areas, and prediction of an experiment's results. Skill 2 questions also tend to ask about science content without actually mentioning it by name. For example, a question might describe the results of one experiment and ask you to predict the results of a second experiment without actually telling you what underlying scientific principles are at work—part of the question's difficulty will be figuring out which principles to apply in order to get the correct answer. On Test Day, 45% of the questions in each science section will be Skill 2 questions. Here are some sample Skill 2 question stems:

Which of the following experimental conditions would most likely yield results similar to those in Figure 2? All of the following conclusions are supported by the information in the passage EXCEPT: The most likely cause of the anomalous results found by the An impact to a person's chest quickly reduces the volume of one of the lungs to 70% of its initial value while not allowing any air to escape from the mouth. By what percentage is the force of outward air pressure increased on a 2 cm<sup>2</sup> portion of the inner surface of the

**Skill 3: Reasoning About the Design and Execution of Research** The MCAT is interested in your ability to critically appraise and analyze research, as this is an important day-to-day task of a physician. We call these questions Skill 3 or Experimental and Research Design questions for short. Skill 3 questions will require you to do the following:

- Identify the role of theory, past findings, and observations in scientific
- Identify testable research questions and hypotheses
- Distinguish between samples and populations and distinguish results that support generalizations about populations
- Identify independent and dependent variables
- Reason about the features of research studies that suggest associations between variables or causal relationships between them (such as temporality and random assignment)
- Identify conclusions that are supported by research results
- Determine the implications of results for real-world situations
- Reason about ethical issues in scientific research

Over the years, the AAMC has received input from medical schools to require more practical research skills of MCAT test takers, and Skill 3 questions are the

response to these demands. This skill is unique in that the outside knowledge you need to answer Skill 3 questions is not taught in any one undergraduate course; instead, the research design principles needed to answer these questions are learned gradually throughout your science classes and especially through any laboratory work you have completed. It should be noted that Skill 3 comprises 10% of the questions in each science section on Test Day. Here are some sample Skill 3 question stems: What is the dependent variable in the study described in the passage? The major flaw in the method used to measure disease susceptibility in Experiment 1 is: Which of the following procedures is most important for the experimenters to follow in order for their study to maintain a proper, randomized sample of research subjects? A researcher would like to test the hypothesis that individuals who move to an urban area during adulthood are more likely to own a car than are those who have lived in an urban area since birth. Which of the following studies would best test this hypothesis? Skill 4: Data-Based and Statistical Reasoning Lastly, the science sections of the MCAT test your ability to analyze the visual and numerical results of experiments and studies. We call these Data and Statistical Analysis questions. Skill 4 questions will require you to do the Use, analyze, and interpret data in figures, graphs, and tables Evaluate whether representations make sense for particular scientific observations and data Use measures of central tendency (mean, median, and mode) and measures of dispersion (range, interquartile range, and standard deviation) to describe data Reason about random and systematic error Reason about statistical significance and uncertainty (interpreting statistical significance levels and interpreting a confidence interval) Use data to explain relationships between variables or make Use data to answer research questions and draw conclusions Skill 4 is included in the MCAT because physicians and researchers spend much of their time examining the results of their own studies and the studies of others, and it's very important for them to make legitimate conclusions and sound judgments based on that data. The MCAT tests Skill 4 on all three science sections with graphical representations of data (charts and bar graphs), as well as numerical ones (tables, lists, and results summarized in sentence or paragraph form). On Test Day, 10% of the



questions in each science section will be Skill 4 questions. Here are some sample Skill 4 question stems: According to the information in the passage, there is an inverse What conclusion is best supported by the findings displayed in Figure A medical test for a rare type of heavy metal poisoning returns a positive result for 98% of affected individuals and 13% of unaffected individuals. Which of the following types of error is most prevalent in If a fourth trial of Experiment 1 was run and yielded a result of 54% compliance, which of the following would be true? Discussing the SIRS tested on the MCAT is a daunting prospect given that the very nature of the skills tends to make the conversation rather abstract. Nevertheless, with enough practice, you'll be able to identify each of the four skills quickly, and you'll also be able to apply the proper strategies to solve those problems on Test Day. If you need a quick reference to remind you of the four SIRS, these guidelines may help: Skill 1 (Science Knowledge) questions ask: Do you remember this science content? Skill 2 (Critical Thinking) questions ask: Do you remember this science content? And if you do, could you please apply it to this novel situation? Could you answer this question that cleverly combines multiple content areas at the same time? Skill 3 (Experimental and Research Design) questions ask: Let's forget about the science content for a while. Could you give some insight into the experimental or research methods involved in this Skill 4 (Data and Statistical Analysis) questions ask: Let's forget about the science content for a while. Could you accurately read some graphs and tables for a moment? Could you make some conclusions or extrapolations based on the information presented?

### Critical Analysis and Reasoning Skills

The Critical Analysis and Reasoning Skills (CARS) section of the MCAT tests three discrete families of textual reasoning skills; each of these families requires a higher level of reasoning than the last. Those three skills are as follows:

1. Foundations of Comprehension (30% of questions)
2. Reasoning Within the Text (30% of questions)
3. Reasoning Beyond the Text (40% of questions)

These three skills are tested through nine humanities- and social sciences- themed passages, with approximately 5 to 7 questions per passage. Let's take a more in-depth look into these three skills. Again, the bullet points of specific objectives for each of the CARS are taken directly from the Official

Guide to the MCAT Exam; the descriptions of what these behaviors mean and sample question stems, however, are written by Kaplan. Foundations of Comprehension Questions in this skill will ask for basic facts and simple inferences about the passage; the questions themselves will be similar to those seen on reading comprehension sections of other standardized exams like the SAT® and ACT®. Foundations of Comprehension questions will require you to do the

Understand the basic components of the text Infer meaning from rhetorical devices, word choice, and text structure This admittedly covers a wide range of potential question types including Main Idea, Detail, Inference, and Definition-in-Context questions, but finding the correct answer to all Foundations of Comprehension questions will follow from a basic understanding of the passage and the point of view of its author (and occasionally that of other voices in the passage). Here are some sample Foundations of Comprehension question stems: Main Idea—The author’s primary purpose in this passage is: Detail—Based on the information in the second paragraph, which of the following is the most accurate summary of the opinion held by (Scattered) Detail—According to the passage, which of the following is FALSE about literary reviews in the 1920s? Inference (Implication)—Which of the following phrases, as used in the passage, is most suggestive that the author has a personal bias toward narrative records of history? Inference (Assumption)—In putting together the argument in the passage, the author most likely assumes: Definition-in-Context—The word “obscure” (paragraph 3), when used in reference to the historian’s actions, most nearly means:

Reasoning Within the Text While Foundations of Comprehension questions will usually depend on interpreting a single piece of information in the passage or understanding the passage as a whole, Reasoning Within the Text questions require more thought because they will ask you to identify the purpose of a particular piece of information in the context of the passage, or ask how one piece of information relates to another. Reasoning Within the Text questions will require you to: Integrate different components of the text to draw relevant The CARS section will also ask you to judge certain parts of the passage or even judge the author. These questions, which fall under the Reasoning Within the Text skill, can ask you to identify

authorial bias, evaluate the credibility of cited sources, determine the logical soundness of an argument, identify the importance of a particular fact or statement in the context of the passage, or search for relevant evidence in the passage to support a given conclusion. In all, this category includes Function and Strengthen–Weaken (Within the Passage) questions, as well as a smattering of related—but rare Here are some sample Reasoning Within the Text question stems: Function—The author’s discussion of the effect of socioeconomic status on social mobility primarily serves which of the following Strengthen–Weaken (Within the Passage)—Which of the following facts is used in the passage as the most prominent piece of evidence in favor of the author’s conclusions? Strengthen–Weaken (Within the Passage)—Based on the role it plays in the author’s argument, The Possessed can be considered: Reasoning Beyond the Text The distinguishing factor of Reasoning Beyond the Text questions is in the title of the skill: the word Beyond. Questions that test this skill, which make up a larger share of the CARS section than questions from either of the other two skills, will always introduce a completely new situation that was not present in the passage itself; these questions will ask you to determine how one influences the other. Reasoning Beyond the Text questions will require you to: Apply or extrapolate ideas from the passage to new contexts Assess the impact of introducing new factors, information, or conditions to ideas from the passage The Reasoning Beyond the Text skill is further divided into Apply and Strengthen–Weaken (Beyond the Passage) questions, and a few other rarely appearing question types. Here are some sample Reasoning Beyond the Text question stems: Apply—If a document were located that demonstrated Berlioz intended to include a chorus of at least 700 in his Grande Messe des Morts, how would the author likely respond? Apply—Which of the following is the best example of a “virtuous rebellion,” as it is defined in the passage? Strengthen–Weaken (Beyond the Passage)—Suppose Jane Austen had written in a letter to her sister, “My strongest characters were those forced by circumstance to confront basic questions about the society in which they lived.” What relevance would this have to the Strengthen–Weaken (Beyond the Passage)—Which of the following sentences, if added to the

end of the passage, would most WEAKEN the author's conclusions in the last paragraph?

Through the Foundations of Comprehension skill, the CARS section tests many of the reading skills you have been building on since grade school, albeit in the context of very challenging doctorate-level passages. But through the two other skills (Reasoning Within the Text and Reasoning Beyond the Text), the MCAT demands that you understand the deep structure of passages and the arguments within them at a very advanced level. And, of course, all of this is tested under very tight timing restrictions: only 102 seconds per question—and that doesn't even include the time spent reading the passages. Here's a quick reference guide to the three CARS skills: Foundations of Comprehension questions ask: Did you understand the passage and its main ideas? What does the passage have to say about this particular detail? What must be true that the author did not say? Reasoning Within the Text questions ask: What's the logical relationship between these two ideas from the How well argued is the author's thesis? Reasoning Beyond the Text questions ask: How does this principle from the passage apply to this new situation? How does this new piece of information influence the arguments in

Each of the four sections of the MCAT is scored between 118 and 132, with the median at approximately 125. This means the total score ranges from 472 to 528, with the median at about 500. Why such peculiar numbers? The AAMC stresses that this scale emphasizes the importance of the central portion of the score distribution, where most students score (around 125 per section, or 500 total), rather than putting undue focus on the high end of the

Note that there is no wrong answer penalty on the MCAT, so you should select an answer for every question—even if it is only a guess. The AAMC has released the 2018–2020 correlation between scaled score and percentile, as shown on the following page. It should be noted that the percentile scale is adjusted and renormalized over time and thus can shift slightly from year to year. Percentile rank updates are released by the AAMC around May 1 of each year.

Source: AAMC. 2021. Summary of MCAT Total and Section Scores. Accessed December Further information on score reporting is included at the end of the next section (see After Your Test).

MCAT Policies and Procedures We strongly encourage you to download the latest copy of

MCAT® Essentials, available on the AAMC's website, to ensure that you have the latest information about registration and Test Day policies and procedures; this document is updated annually. A brief summary of some of the most important rules is provided here. The only way to register for the MCAT is online. You can access AAMC's registration system at [www.aamc.org/mcat](http://www.aamc.org/mcat). You will be able to access the site approximately six months before Test Day. The AAMC designates three registration "Zones"—Gold, Silver, and Bronze. Registering during the Gold Zone (from the opening of registration until approximately one month before Test Day) provides the most flexibility and lowest test fees. The Silver Zone runs until approximately two to three weeks before Test Day and has less flexibility and higher fees; the Bronze Zone runs until approximately one to two weeks before Test Day and has the least flexibility and highest fees. Fees and the Fee Assistance Program (FAP) Payment for test registration must be made by MasterCard or VISA. As described earlier, the fees for registering for the MCAT—as well as rescheduling the exam or changing your testing center—increase as one approaches Test Day. In addition, it is not uncommon for test centers to fill up well in advance of the registration deadline. For these reasons, we recommend identifying your preferred Test Day as soon as possible and registering. There are ancillary benefits to having a set Test Day, as well: when you know the date you're working toward, you'll study harder and are less likely to keep pushing back the exam. The AAMC offers a Fee Assistance Program (FAP) for students with financial hardship to help reduce the cost of taking the MCAT, as well as for the American Medical College Application Service (AMCAS®) application. Further information on the FAP can be found at [www.aamc.org/students/applying/fap](http://www.aamc.org/students/applying/fap). On Test Day, you will be required to present a qualifying form of ID. Generally, a current driver's license or United States passport will be sufficient (consult the AAMC website for the full list of qualifying criteria). When registering, take care to spell your first and last names (middle names, suffixes, and prefixes are not required and will not be verified on Test Day) precisely the same as they appear on this ID; failure to provide this ID at the test center or differences in spelling between your registration

and ID will be considered a “no-show,” and you will not receive a refund for the exam. During Test Day registration, other identity data collected may include: a digital palm vein scan, a Test Day photo, a digitization of your valid ID, and signatures. Some testing centers may use a metal detection wand to ensure that no prohibited items are brought into the testing room. Prohibited items include all electronic devices, including watches and timers, calculators, cell phones, and any and all forms of recording equipment; food, drinks (including water), and cigarettes or other smoking paraphernalia; hats and scarves (except for religious purposes); and books, notes, or other study materials. If you require a medical device, such as an insulin pump or pacemaker, you must apply for accommodated testing. During breaks, you are allowed access to food and drink, but not to electronic devices, including Testing centers are under video surveillance and the AAMC does not take potential violations of testing security lightly. The bottom line: know the rules and don’t break them. Students with disabilities or medical conditions can apply for accommodated testing. Documentation of the disability or condition is required, and requests may take two months—or more—to be approved. For this reason, it is recommended that you begin the process of applying for accommodated testing as early as possible. More information on applying for accommodated testing can be found at [After Your Test](#)

When your MCAT is all over, no matter how you feel you did, be good to yourself when you leave the test center. Celebrate! Take a nap. Watch a movie. Get some exercise. Plan a trip or outing. Call up all of your neglected friends or message them on social media. Go out for snacks or drinks with people you like. Whatever you do, make sure that it has absolutely nothing to do with thinking too hard—you deserve some rest and relaxation. Perhaps most importantly, do not discuss specific details about the test with anyone. For one, it is important to let go of the stress of Test Day, and reliving your exam only inhibits you from being able to do so. But more significantly, the Examinee Agreement you sign at the beginning of your exam specifically prohibits you from discussing or disclosing exam content. The AAMC is known to seek out individuals who violate this agreement and retains the right to prosecute these individuals at their discretion. This means that you should not, under any

circumstances, discuss the exam in person or over the phone with other individuals—including us at Kaplan— or post information or questions about exam content to Facebook, Student Doctor Network, or other online social media. You are permitted to comment on your “general exam experience,” including how you felt about the exam overall or an individual section, but this is a fine line. In summary: if you’re not certain whether you can discuss an aspect of the test or not, just don’t do it! Do not let a silly Facebook post stop you from becoming the doctor you deserve to be. Scores are typically released approximately one month after Test Day. The release is staggered during the afternoon and evening, ending at 5 p.m. Eastern. This means that not all examinees receive their scores at exactly the same time. Your score report will include a scaled score for each section between 118 and 132, as well as your total combined score between 472 and 528. These scores are given as confidence intervals. For each section, the confidence interval is approximately the given score  $\pm 1$ ; for the total score, it is approximately the given score  $\pm 2$ . You will also be given the corresponding percentile rank for each of these section scores and the total AAMC Contact Information For further questions, contact the MCAT team at the Association of American Medical Colleges: MCAT Resource Center Association of American Medical Colleges The Kaplan MCAT Review project began shortly after the release of the Preview Guide for the MCAT 2015 Exam, 2nd edition. Through thorough analysis by our staff psychometricians, we were able to analyze the relative yield of the different topics on the MCAT, and we began constructing tables of contents for the books of the Kaplan MCAT Review series. A dedicated staff of 30 writers, 7 editors, and 32 proofreaders worked over 5,000 combined hours to produce these books. The format of the books was heavily influenced by weekly meetings with Kaplan’s learning science team. In the years since this book was created, a number of opportunities for expansion and improvement have occurred. The current edition represents the culmination of the wisdom accumulated during that time frame, and it also includes several new features designed to improve the reading and learning experience in these texts. These books were submitted for publication in April 2022. For any updates after this date, please visit

[www.kaptest.com/retail-book](http://www.kaptest.com/retail-book)- If you have any questions about the content presented here, email [KaplanMCATfeedback@kaplan.com](mailto:KaplanMCATfeedback@kaplan.com). For other questions not related to content, email [booksupport@kaplan.com](mailto:booksupport@kaplan.com). Each book has been vetted through at least ten rounds of review. To that end, the information presented in these books is true and accurate to the best of our knowledge. Still, your feedback helps us improve our prep materials. Please notify us of any inaccuracies or errors in the books by sending an email to [KaplanMCATfeedback@kaplan.com](mailto:KaplanMCATfeedback@kaplan.com).

Kaplan MCAT Biochemistry Review, and the other six books in the Kaplan MCAT Review series, bring the Kaplan classroom experience to you—right in your home, at your convenience. This book offers the same Kaplan content review, strategies, and practice that make Kaplan the #1 choice for This book is designed to help you review the biochemistry topics covered on the MCAT. Please understand that content review—no matter how thorough —is not sufficient preparation for the MCAT! The MCAT tests not only your science knowledge but also your critical reading, reasoning, and problem- solving skills. Do not assume that simply memorizing the contents of this book will earn you high scores on Test Day; to maximize your scores, you must also improve your reading and test-taking skills through MCAT-style questions and practice tests. At the beginning of each section, you'll find a short list of objectives describing the skills covered within that section. Learning objectives for these texts were developed in conjunction with Kaplan's learning science team, and have been designed specifically to focus your attention on tasks and concepts that are likely to show up on your MCAT. These learning objectives will function as a means to guide your study, and indicate what information and relationships you should be focused on within each section. Before starting each section, read these learning objectives carefully. They will not only allow you to assess your existing familiarity with the content, but also provide a goal-oriented focus for your studying experience of the MCAT Concept Checks At the end of each section, you'll find a few open-ended questions that you can use to assess your mastery of the material. These MCAT Concept Checks were introduced after numerous conversations with Kaplan's learning science team. Research has demonstrated repeatedly that introspection and self-analysis improve



mastery, retention, and recall of material. Complete these MCAT Concept Checks to ensure that you've got the key points from each section before moving on! Science Mastery Assessments At the beginning of each chapter, you'll find 15 MCAT-style practice questions. These are designed to help you assess your understanding of the chapter before you begin reading the chapter. Using the guidance provided with the assessment, you can determine the best way to review each chapter based on your personal strengths and weaknesses. Most of the questions in the Science Mastery Assessments focus on the first of the Scientific Inquiry and Reasoning Skills (Knowledge of Scientific Concepts and Principles), although there are occasional questions that fall into the second or fourth SIRS (Scientific Reasoning and Problem-Solving and Data-Based and Statistical Reasoning, respectively). In addition, in your online resources you'll find a test-like passage set covering the same content you just studied to ensure you can also apply your knowledge the way the MCAT will expect Guided Examples with Expert Thinking Embedded in each chapter of this book is a Guided Example with Expert Thinking. Each of these guided examples will be located in the same section as the content used in that example. Each example will feature an MCAT- level scientific article, that simulates an MCAT experiment passage. Read through the passage as you would on the real MCAT, referring to the Expert Thinking material to the right of the passage to clarify the key information you should be gathering from each paragraph. Read and attempt to answer the associated question once you have worked through the passage. There is a full explanation, including the correct answer, following the given question. These passages and questions are designed to help build your critical thinking, experimental reasoning, and data interpretation skills as preparation for the challenges you will face on the MCAT. The following is a guide to the five types of sidebars you'll find in Kaplan MCAT Biochemistry Review: Bridge: These sidebars create connections between science topics that appear in multiple chapters throughout the Kaplan MCAT Review Key Concept: These sidebars draw attention to the most important takeaways in a given topic, and they sometimes offer synopses or overviews of complex information. If you understand nothing else, make sure you grasp the Key Concepts

for any given subject. **MCAT Expertise:** These sidebars point out how information may be tested on the MCAT or offer key strategy points and test-taking tips that you should apply on Test Day. **Mnemonic:** These sidebars present memory devices to help recall. **Real World:** These sidebars illustrate how a concept in the text relates to the practice of medicine or the world at large. While this is not information you need to know for Test Day, many of the topics in Real World sidebars are excellent examples of how a concept may appear in a passage or discrete (stand-alone) question on the MCAT.

**What This Book Covers** The information presented in the Kaplan MCAT Review series covers everything listed on the official MCAT content lists. Every topic in these lists is covered in the same level of detail as is common to the undergraduate and postbaccalaureate classes that are considered prerequisites for the MCAT. Note that your premedical classes may include topics not discussed in these books, or they may go into more depth than these books do. Additional exposure to science content is never a bad thing, but all of the content knowledge you are expected to have walking in on Test Day is covered in

**Chapter profiles**, on the first page of each chapter, represent a holistic look at the content within the chapter, and will include a pie chart as well as text information. The pie chart analysis is based directly on data released by the AAMC, and will give a rough estimate of the importance of the chapter in relation to the book as a whole. Further, the text portion of the Chapter Profiles includes which AAMC content categories are covered within the chapter. These are referenced directly from the AAMC MCAT exam content listing, available on the testmaker's website. You'll also see new High-Yield badges scattered throughout the sections of

**In This Chapter**

- 1.1 Amino Acids Found in Proteins
- A Note on Terminology
- Stereochemistry of Amino Acids
- Structures of the Amino Acids
- Hydrophobic and Hydrophilic Amino Acids
- Amino Acid Abbreviations
- 1.2 Acid-Base Chemistry of Amino Acids
- Protonation and Deprotonation
- Titration of Amino Acids
- 1.3 Peptide Bond Formation and Peptide Bond Formation
- Peptide Bond Hydrolysis
- 1.4 Primary and Secondary Protein
- 1.5 Tertiary and Quaternary Protein

**Folding and the Solvation Layer**

1.1 Amino Acids Found in After Chapter 1.1, you will be able to:

These badges represent the top 100 topics most tested by the AAMC. In other words,

according to the testmaker and all our experience with their resources, a High-Yield badge means more questions on Test Day. This book also contains a thorough glossary and index for easy navigation of In the end, this is your book, so write in the margins, draw diagrams, highlight the key points—do whatever is necessary to help you get that higher score. We look forward to working with you as you achieve your dreams and become the doctor you deserve to be!

**Studying with This Book** In addition to providing you with the best practice questions and test strategies, Kaplan's team of learning scientists are dedicated to researching and testing the best methods for getting the most out of your study time. Here are their top four tips for improving retention:

- Review multiple topics in one study session. This may seem counterintuitive—we're used to practicing one skill at a time in order to improve each skill. But research shows that weaving topics together leads to increased learning. Beyond that consideration, the MCAT often includes more than one topic in a single question. Studying in an integrated manner is the most effective way to prepare for this test.
- Customize the content. Drawing attention to difficult or critical content can ensure you don't overlook it as you read and re-read sections. The best way to do this is to make it more visual—highlight, make tabs, use stickies, whatever works. We recommend highlighting only the most important or difficult sections of text. Selective highlighting of up to about 10% of text in a given chapter is great for emphasizing parts of the text, but over-highlighting can have the opposite effect.
- Repeat topics over time. Many people try to memorize concepts by repeating them over and over again in succession. Our research shows that retention is improved by spacing out the repeats over time and mixing up the order in which you study content. For example, try reading chapters in a different order the second (or third!) time around. Revisit practice questions that you answered incorrectly in a new sequence. Perhaps information you reviewed more recently will help you better understand those questions and solutions you struggled with in the past.
- Take a moment to reflect. When you finish reading a section for the first time, stop and think about what you just read. Jot down a few thoughts in the margins or in your notes about why the content is important or what topics came to mind when you read it. Associating learning

with a memory is a fantastic way to retain information! This also works when answering questions. After answering a question, take a moment to think through each step you took to arrive at a solution. What led you to the answer you chose? Understanding the steps you took will help you make good decisions when answering future questions. In addition to the resources located within this text, you also have additional online resources awaiting you at [www.kaptest.com/booksonline](http://www.kaptest.com/booksonline). Make sure to log on and take advantage of free practice and other resources! Please note that access to the online resources is limited to the original owner of this book. The first year of medical school is a frenzied experience for most students. To meet the requirements of a rigorous work schedule, students either learn to prioritize their time or else fall hopelessly behind. It's no surprise, then, that the MCAT, the test specifically designed to predict success in medical school, is a high-speed, time-intensive test. The MCAT demands excellent time-management skills, endurance, and grace under pressure both during the test as well as while preparing for it. Having a solid plan of attack and sticking with it are key to giving you the confidence and structure you need.

### Creating a Study Plan

The best time to create a study plan is at the beginning of your MCAT preparation. If you don't already use a calendar, you will want to start. You can purchase a planner, print out a free calendar from the Internet, use a built-in calendar or app on one of your smart devices, or keep track using an interactive online calendar. Pick the option that is most practical for you and that you are most likely to use consistently. Once you have a calendar, you'll be able to start planning your study schedule with the following steps:

1. Fill in your obligations and choose a day off. Write in all your school, extracurricular, and work obligations first: class sessions, work shifts, and meetings that you must attend. Then add in your personal obligations: appointments, lunch dates, family and social time, etc. Making an appointment in your calendar for hanging out with friends or going to the movies may seem strange at first, but planning social activities in advance will help you achieve a balance between personal and professional obligations even as life gets busy. Having a happy balance allows you to be more focused and productive when it comes time to study, so stay well-rounded and don't neglect anything that is

important to you. In addition to scheduling your personal and professional obligations, you should also plan your time off. Taking some time off is just as important as studying. Kaplan recommends taking at least one full day off per week, ideally from all your study obligations but at minimum from studying for the MCAT. 2. Add in study blocks around your obligations. Once you have established your calendar's framework, add in study blocks around your obligations, keeping your study schedule as consistent as possible across days and across weeks. Studying at the same time of day as your official test is ideal for promoting recall, but if that's not possible, then fit in study blocks wherever you can. To make your studying as efficient as possible, block out short, frequent periods of study time throughout the week. From a learning perspective, studying one hour per day for six days per week is much more valuable than studying for six hours all at once one day per week. Specifically, Kaplan recommends studying for no longer than three hours in one sitting. Within those three-hour blocks, also plan to take ten-minute breaks every hour. Use these breaks to get up from your seat, do some quick stretches, get a snack and drink, and clear your mind. Although ten minutes of break for every 50 minutes of studying may sound like a lot, these breaks will allow you to deal with distractions and rest your brain so that, during the 50-minute study blocks, you can remain fully engaged and completely focused. 3. Add in your full-length practice tests. Next, you'll want to add in full-length practice tests. You'll want to take one test very early in your prep and then spread your remaining full-length practice tests evenly between now and your test date. Staggering tests in this way allows you to form a baseline for comparison and to determine which areas to focus on right away, while also providing realistic feedback throughout your prep as to how you will perform on Test Day. When planning your calendar, aim to finish your full-length practice tests and the majority of your studying by one week before Test Day, which will allow you to spend that final week completing a brief review of what you already know. In your online resources, you'll find sample study calendars for several different Test Day timelines to use as a starting point. The sample calendars may include more focus than you need in some areas, and less in others, and it may not fit your

timeline to Test Day. You will need to customize your study calendar to your needs using the steps above. The total amount of time you spend studying each week will depend on your schedule, your personal prep needs, and your time to Test Day, but it is recommended that you spend somewhere in the range of 300–350 hours preparing before taking the official MCAT. One way you could break this down is to study for three hours per day, six days per week, for four months, but this is just one approach. You might study six days per week for more than three hours per day. You might study over a longer period of time if you don't have much time to study each week. No matter what your plan is, ensure you complete enough practice to feel completely comfortable with the MCAT and its content. A good sign you're ready for Test Day is when you begin to earn your goal score consistently in practice.

How to Study The MCAT covers a large amount of material, so studying for Test Day can initially seem daunting. To combat this we have some tips for how to take control of your studying and make the most of your time. To take control of the amount of content and practice required to do well on the MCAT, break the content down into specific goals for each week instead of attempting to approach the test as a whole. A goal of "I want to increase my overall score by 5 points" is too big, abstract, and difficult to measure on the small scale. More reasonable goals are "I will read two chapters each day this week." Goals like this are much less overwhelming and help break studying into manageable pieces. As you go through this book, much of the information will be familiar to you. After all, you have probably seen most of the content before. However, be very careful: Familiarity with a subject does not necessarily translate to knowledge or mastery of that subject. Do not assume that if you recognize a concept you actually know it and can apply it quickly at an appropriate level. Don't just passively read this book. Instead, read actively: Use the free margin space to jot down important ideas, draw diagrams, and make charts as you read. Highlighting can be an excellent tool, but use it sparingly: highlighting every sentence isn't active reading, it's coloring. Frequently stop and ask yourself questions while you read (e.g., What is the main point? How does this fit into the overall scheme of things? Could I thoroughly explain this to someone else?). By making

connections and focusing on the grander scheme, not only will you ensure you know the essential content, but you also prepare yourself for the level of critical thinking required by the MCAT.

### Focus on Areas of Greatest Opportunity

If you are limited by only having a minimal amount of time to prepare before Test Day, focus on your biggest areas of opportunity first. Areas of opportunity are topic areas that are highly tested and that you have not yet mastered. You likely won't have time to take detailed notes for every page of these books; instead, use your results from practice materials to determine which areas are your biggest opportunities and seek those out. After you've taken a full-length test, make sure you are using your performance report to best identify areas of opportunity. Skim over content matter for which you are already demonstrating proficiency, pausing to read more thoroughly when something looks unfamiliar or particularly difficult. Begin with the Science Mastery Assessment at the beginning of each chapter. If you can get all of those questions correct within a reasonable amount of time, you may be able to quickly skim through that chapter, but if the questions prove to be more difficult, then you may need to spend time reading the chapter or certain subsections of the chapter more thoroughly.

### Practice, Review, and Tracking

Leave time to review your practice questions and full-length tests. You may be tempted, after practicing, to push ahead and cover new material as quickly as possible, but failing to schedule ample time for review will actually throw away your greatest opportunity to improve your performance. The brain rarely remembers anything it sees or does only once. When you carefully review the questions you've solved (and the explanations for them), the process of retrieving that information reopens and reinforces the connections you've built in your brain. This builds long-term retention and repeatable skill sets—exactly what you need to beat the MCAT.

While reviewing, take notes about the specific reasons why you missed questions you got wrong or had to guess on, perhaps by using a spreadsheet like the one below. Keep adding to the same Why I Missed It Sheet (WIMIS) as you complete more practice, and periodically review your WIMIS to identify any patterns you see, such as consistently missing questions in certain content areas or falling for the same testmaker traps. As you move through your MCAT

prep, adjust your study plan based on your available study time and the results of your review. Your strengths and weaknesses are likely to change over the course of your prep. Keep addressing the areas that are most important to your score, shifting your focus as those areas change. For more help with reviewing and making the most of your full-length tests, including a Why I Missed It Sheet template, make sure to check out the videos and resources in your online syllabus.

Why I missed it Confused electron absorption Need to memorize equation Didn't read "not" in answer choice; slow down! Out of Scope Forgot to research answer Where to Study

One often-overlooked aspect of studying is the environment where the learning actually occurs. Although studying at home is many students' first choice, several problems can arise in this environment, chief of which are distractions. Studying can be a mentally draining process, so as time passes, these distractions become ever more tempting as escape routes. Although you may have considerable willpower, there's no reason to make staying focused harder than it needs to be. Instead of studying at home, head to a library, quiet coffee shop, or another new location whenever possible. This will eliminate many of the usual distractions and also promote efficient studying; instead of studying off and on at home over the course of an entire day, you can stay at the library for three hours of effective studying and enjoy the rest of the day off from the MCAT. No matter where you study, make your practice as much like Test Day as possible. Just as is required during the official test, don't have snacks or chew gum during your study blocks. Turn off your music, television, and phone. Practice on the computer with your online resources to simulate the computer-based test environment. When completing practice questions, do your work on scratch paper or noteboard sheets rather than writing directly on any printed materials since you won't have that option on Test Day. Because memory is tied to all of your senses, the more test-like you can make your studying environment, the easier it will be on Test Day to recall the information you're putting in so much work to learn.

Amino Acids, Peptides, and Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify



the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate.

**How to Use This Assessment**

**If you answer 0–7 questions correctly:** Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one.

**If you answer 8–11 questions correctly:** Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect.

**If you answer 12–15 questions correctly:** Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. In a neutral solution, most amino acids exist as:

A. positively charged compounds. C. negatively charged compounds. D. hydrophobic molecules.

2. At pH 7, the charge on a glutamic acid molecule is:

3. Which of the following statements is most likely to be true of nonpolar R groups in aqueous solution?

A. They are hydrophilic and found buried within proteins. B. They are hydrophilic and found on protein surfaces. C. They are hydrophobic and found buried within proteins. D. They are hydrophobic and found on protein surfaces.

4. Scientists discover a cDNA sequence for an uncharacterized protein. In their initial studies, they use a computer program designed to predict protein structure. Which of the following levels of protein structure can be most accurately predicted?

A. Primary structure B. Secondary structure C. Tertiary structure D. Quaternary structure

5. How many

distinct tripeptides can be formed from one valine molecule, one alanine molecule, and one leucine molecule?

6. Which of the following best describes the change in entropy that occurs during protein folding?

A. Entropy of both the water and the protein increase. B. Entropy of the water increases; entropy of the protein C. Entropy of the water decreases; entropy of the protein D. Entropy of both the water and the protein decrease.

7. An  $\alpha$ -helix is most likely to be held together by:

A. disulfide bonds. B. hydrophobic effects. C. hydrogen bonds. D. ionic attractions between side chains.

8. Which of the following is least likely to cause denaturation of

A. Heating the protein to 100°C B. Adding 8 M urea C. Moving it to a more hypotonic environment D. Adding a detergent such as sodium dodecyl sulfate

9. A particular  $\alpha$ -helix is known to cross the cell membrane. Which of these amino acids is most likely to be found in the transmembrane portion of the helix?

10. Which of these amino acids has a chiral carbon in its side chain?

A. I only B. II only C. II and III only D. I, II, and III

11. Following translation and folding, many receptor tyrosine kinases exist as monomers in their inactive state on the cell membrane. Upon the binding of a ligand, these proteins dimerize and initiate a signaling cascade. During this process, their highest element of protein structure changes from:

A. secondary to tertiary. B. tertiary to quaternary. C. primary to secondary. D. secondary to quaternary.

12. Which of these amino acids has a side chain that can become ionized in cells?

13. In lysine, the pKa of the side chain is about 10.5. Assuming that the pKa of the carboxyl and amino groups are 2 and 9, respectively, the pI of lysine is closest to:

14. Which of the following is a reason for conjugating proteins?

I. To direct their delivery to a particular organelle II. To direct their delivery to the cell membrane III. To add a cofactor needed for their activity

A. I only B. II only C. II and III only D. I, II, and III

15. Collagen consists of three helices with carbon backbones that are tightly wrapped around one another in a "triple helix." Which of these amino acids is most likely to be found in the highest concentration in collagen?

Amino Acids, Peptides, and In This Chapter

1.1 Amino Acids Found in Proteins A Note on Terminology Stereochemistry of Amino Acids Structures of the Amino Acids Hydrophobic and Hydrophilic Amino Acids Amino Acid Abbreviations

1.2 Acid-Base Chemistry of Amino Acids

Protonation and Deprotonation Titration of Amino Acids 1.3 Peptide Bond Formation and Hydrolysis Peptide Bond Formation Peptide Bond Hydrolysis 1.4 Primary and Secondary Protein Structure 1.5 Tertiary and Quaternary Protein Structure Folding and the Solvation Layer

The content in this chapter should be relevant to about 20% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories: 1A: Structure and function of proteins and their constituent amino acids 5D: Structure, function, and reactivity of biologically-relevant molecules

How important are amino acids? Consider sickle cell disease. People with sickle cell disease have red blood cells that, under certain conditions, can become rigid and sickle-shaped. Those sickle-shaped cells can become stuck in capillaries, blocking them. In severe cases, it can block enough of the blood supply to cause damage to several organs, such as the kidneys, liver, and spleen. This happens because of a mutation in hemoglobin, the protein in red blood cells that transports oxygen. Remarkably, the difference between the normal form of hemoglobin, HbA, and the one that causes sickle cell disease, HbS, is a seemingly minor one. All it takes is a change in a single amino acid on the surface of hemoglobin: the sixth amino acid in two of its four chains is changed from glutamic acid to valine. That minor difference allows the deoxygenated form of HbS to aggregate and precipitate, which leads to the sickled shape—and all the symptoms—of sickle cell. This chapter represents a whopping 20% of all biochemistry questions you will see on Test Day. That makes amino acids one of the highest yield subjects within any of the review books! Make sure to work sufficient study of these materials into your study plan. In this chapter, we'll take a look at the basics of proteins by focusing on the amino acids that compose them and how those amino acids contribute to the physical and chemical properties of proteins.

1.1 Amino Acids Found in Proteins After Chapter 1.1, you will be able to:

- Recognize common abbreviations for amino acids, such as Glu and Y
- Distinguish the stereochemistries, typical cellular locations, and reactivities of the 20 major amino acids
- Identify the major amino acids, such as:

Amino acids are molecules that contain two functional groups: an amino group ( $\text{NH}_2$ ) and a carboxyl group ( $\text{COOH}$ ). In this chapter, we'll focus

specifically on the  $\alpha$ -amino acids, in which the amino group and the carboxyl group are bonded to the same carbon, the  $\alpha$ -carbon of the carboxylic acid. Think of the  $\alpha$ -carbon as the central carbon of the amino acid, as shown in Figure 1.1. **Figure 1.1 Amino Acid Structure** The “High-Yield” badge on this section indicates that the content is frequently tested on the MCAT. Remember that for carboxylic acids, the  $\alpha$ -carbon is the carbon adjacent to the carboxyl carbon. The structure and nomenclature of carboxylic acids are discussed in Chapter 8 of MCAT Organic Chemistry Review. In addition to the amino and carboxyl groups, the  $\alpha$ -carbon has two other groups attached to it: a hydrogen atom and a side chain, also called an R group, which is specific to each amino acid. The side chains determine the properties of amino acids, and therefore their functions. The side chains (R groups) of amino acids determine their chemical properties. **A Note on Terminology** Amino acids do not need to have both the amino and carboxyl groups bonded to the same carbon. For example, the neurotransmitter  $\gamma$ -aminobutyric acid (GABA) has the amino group on the gamma ( $\gamma$ ) carbon, three carbons away from the carboxyl group. Similarly, not every amino acid found in the human body is specified by a codon in the genetic code or incorporated into proteins. One example is ornithine, one of the intermediates in the urea cycle, the metabolic process by which the body excretes excess nitrogen. There are also some amino acids that are specifically modified for specialized roles in the body; for example, lysine is sometimes converted into pyrrolysine. While the MCAT could include passages on GABA or other nonstandard amino acids, they are not part of the background information you’re expected to know for Test Day. That said, the Association of American Medical Colleges (AAMC) has specifically stated they’ll focus on the 20  $\alpha$ -amino acids encoded by the human genetic code, also called proteinogenic amino acids. So, for the rest of this chapter, we’ll use the term amino acid to refer specifically to these. **Stereochemistry of Amino Acids** For most amino acids, the  $\alpha$ -carbon is a chiral (or stereogenic) center, as it has four different groups attached to it. Thus, most amino acids are optically active. The one exception is glycine, which has a hydrogen atom as its R group, making it achiral, as shown in Figure 1.2. **Figure 1.2 Glycine** All chiral amino acids used in eukaryotes are L-amino acids, so

the amino group is drawn on the left in a Fischer projection, as demonstrated in Figure 1.3. In the Cahn–Ingold–Prelog system, this translates to an (S) absolute configuration for almost all chiral amino acids. The only exception is cysteine, which, while still being an L-amino acid, has an (R) absolute configuration because the CH<sub>2</sub>SH group has priority over the COOH.

### Figure 1.3 L- and D-Amino Acids

Except for glycine, all amino acids are chiral—and except for cysteine, all of them have an (S) absolute configuration. While L-amino acids are the only ones found in eukaryotic proteins, D-amino acids do exist. One example is gramicidin, an antibiotic produced by a soil bacterium called *Bacillus brevis*, in which D- and L-amino acids alternate in the primary structure.

### Structures of the Amino Acids

There are several ways to classify amino acids. In this section, we'll break them down by the structures of their side chains.

#### Nonpolar, Nonaromatic Side Chains

Seven amino acids, shown in Figure 1.4a, fall into this class. Glycine, discussed earlier, has a single hydrogen atom as its side chain and is therefore achiral. It is also the smallest amino acid. Four other amino acids —alanine, valine, leucine, and isoleucine—have alkyl side chains containing one to four carbons.

### Figure 1.4a Amino Acids with Nonpolar, Nonaromatic Side Chains

Methionine is one of only two amino acids that contains a sulfur atom in its side chain. Nevertheless, because the sulfur has a methyl group attached, it is considered relatively nonpolar. The AAMC's practice materials have made it clear that test takers are expected to know the structures, names, and three-letter and one-letter abbreviations for the amino acids. Finally, proline is unique in that it forms a cyclic amino acid. In all the other amino acids, the amino group is attached only to the  $\alpha$ -carbon. In proline, however, the amino nitrogen becomes a part of the side chain, forming a five-membered ring. That ring places notable constraints on the flexibility of proline, which limits where it can appear in a protein and can have significant effects on proline's role in secondary structure. The MCAT writers strive to avoid misuse of terminology. Some textbooks problematically describe proline as an imino acid because the amino nitrogen forms two bonds to carbon. The MCAT won't use this term because an imine is specifically a molecule with a carbon–nitrogen double bond.

#### Aromatic Side Chains

Three amino acids have uncharged aromatic side chains

and are depicted in Figure 1.4b. The largest of these is tryptophan, which has a double-ring system that contains a nitrogen atom. The smallest is phenylalanine, which has a benzyl side chain (a benzene ring plus a CH<sub>2</sub> group). Adding an OH group to phenylalanine gives the third member, tyrosine. While phenylalanine is relatively nonpolar, the OH group makes tyrosine

**Figure 1.4b Amino Acids with Aromatic Side Chains**

**Polar Side Chains** Five amino acids, shown in Figure 1.4c, have side chains that are polar but not aromatic. Serine and threonine both have OH groups in their side chains, which makes them highly polar and able to participate in hydrogen bonding. Asparagine and glutamine have amide side chains. Unlike the amino group common to all amino acids, the amide nitrogens do not gain or lose protons with changes in pH; they do not become charged. The last amino acid with a polar side chain is cysteine, which has a thiol (SH) group in its side chain. Because sulfur is larger than oxygen, the SH bond is longer and weaker than the OH bond. In addition, sulfur is more electronegative than oxygen. This leaves the thiol group in cysteine prone to oxidation, a reaction we'll study later in this chapter. Make sure you know your carboxylic acid derivatives for Test Day! They are discussed in Chapter 9 of MCAT Organic Chemistry Review.

**Figure 1.4c Amino Acids with Polar Side Chains**

**Negatively Charged (Acidic) Side Chains** Only two of the 20 amino acids have negative charges on their side chains at physiological pH (7.4). Those two are aspartic acid (aspartate), which is related to asparagine, and glutamic acid (glutamate), which is related to glutamine. Unlike asparagine and glutamine, aspartate and glutamate have carboxylate (COO<sup>-</sup>) groups in their side chains, rather than amides. Note that aspartate is simply the deprotonated form of aspartic acid, and glutamate is the deprotonated form of glutamic acid. These two amino acids are depicted in Figure 1.4d.

**Figure 1.4d Amino Acids with Negatively Charged Side Chains**

On the MCAT, you're likely to see anion names (aspartate and glutamate) instead of acid names (aspartic acid and glutamic acid) because most acids in cells exist in the deprotonated form. This also applies to molecules other than amino acids (malate instead of malic acid). The catalytic triad found in chymotrypsin makes use of the histidine side chain's ability to gain a proton. The histidine residue in its active site removes a proton from the OH

group of a serine residue side chain, which facilitates nucleophilic attack by the serine residue on the carbonyl carbon atom of the substrate. Chymotrypsin's role as a digestive enzyme is discussed in Chapter 9 of MCAT Biology Review.

### Positively Charged (Basic) Side Chains

The remaining three amino acids, shown in Figure 1.4e, have side chains that have positively charged nitrogen atoms. Lysine has a terminal primary amino group, while arginine has three nitrogen atoms in its side chain; the positive charge is delocalized over all three nitrogen atoms. The final amino acid, histidine, has an aromatic ring with two nitrogen atoms (this ring is called an imidazole). You might be wondering how histidine can acquire a positive charge. The  $pK_a$  of the side chain is relatively close to 7.4—it's about 6—so, at physiologic pH, one nitrogen atom is protonated and the other isn't. Under more acidic conditions, the second nitrogen atom can become protonated, giving the side chain a positive charge.

### Figure 1.4e

### Amino Acids with Positively Charged Side Chains

### Hydrophobic and Hydrophilic Amino Acids

Classifying amino acid side chains as hydrophobic or hydrophilic is actually a very complex matter. For example, tyrosine has both an OH group and an aromatic ring—so which one “wins”? A few clear conclusions can be drawn, though. First, the amino acids with long alkyl side chains—alanine, isoleucine, leucine, valine, and phenylalanine—are all strongly hydrophobic and thus more likely to be found in the interior of proteins, away from water on the surface of the protein. Second, all the amino acids with charged side chains—positively charged histidine, arginine, and lysine, plus negatively charged glutamate and aspartate—are hydrophilic, as are the amides asparagine and glutamine. The remaining amino acids lie somewhere in the middle and are neither particularly hydrophilic nor particularly hydrophobic. The surface of a protein tends to be rich in amino acids with charged side chains. Strongly hydrophobic amino acids tend to be found in the interior of proteins.

### Amino Acid Abbreviations

Now that we have explored the structures of the 20 proteinogenic amino acids, it is worth mentioning that you are expected to be able to identify an amino acid on the MCAT not only by name, but also by its three-letter and one-letter abbreviations. These abbreviations are listed in Table 1.1.

### Table 1.1 Three- and One-Letter Abbreviations of Amino

Acids Three-letter abbreviations are used to identify amino acids in many contexts. One-letter abbreviations are primarily used when space is at a premium as with formulas of long protein sequences, the labeling of individual amino acids in figures, and mutation shorthand. While each type of mutation has its own notation, substitution is the most likely to show up on Test Day. For example, "E6V" indicates that the sixth amino acid (glutamic acid, E) has been changed to valine (V). It bears repeating: the structures and abbreviations (both three- and one-letter) have been tested heavily on both natural science sections of the MCAT. Make sure you know this page

MCAT CONCEPT CHECK 1.1 Before you move on, assess your understanding of the material with these questions.

1. What are the four groups attached to the central ( $\alpha$ ) carbon of a proteinogenic amino acid?
2. What is the stereochemistry of the chiral amino acids that appear in eukaryotic L or D? (R) or (S)? (Exception:) \_\_\_\_\_
3. Which amino acids fit into each of these categories? (Note: The number in parentheses indicates the number of amino acids in that category.) Nonpolar, nonaromatic (7): Negatively charged/acidic (2): Positively charged/basic (3):
4. Where do hydrophobic amino acids tend to reside within a protein? What about
5. Identify the amino acids below by their one-letter abbreviation.

Solutions to concept checks for a given chapter in MCAT Biochemistry Review can be found near the end of the chapter in which the concept check is located, following the Concept Summary for that chapter.

### 1.2 Acid-Base Chemistry of Amino Acids

After Chapter 1.2, you will be able to:

- Identify the predominant ion form of the generic amino acid backbone given a pH
- Calculate pI values for an amino acid given pKa values for backbone and side
- Predict the general form of the titration curve for an amino acid

You are not expected to know exact values for isoelectric points or side chain pKa values. The MCAT will either provide you with numerical data to use in answering a question or test clear-cut distinctions that can be made without additional information (such as, Which is more hydrophilic, valine or lysine? but not Which is more hydrophobic, valine or alanine?). The AAMC loves to use amino acids to test your understanding of acid-base chemistry because they have both an acidic carboxylic acid group and a basic amino group. That makes them amphoteric species, as they can either



accept a proton or donate a proton; how they react depends on the pH of their environment. The key to understanding the behavior of amino acids is to remember two facts: Ionizable groups tend to gain protons under acidic conditions and lose them under basic conditions. So, in general, at low pH, ionizable groups tend to be protonated; at high pH, they tend to be deprotonated. The pKa of a group is the pH at which, on average, half of the molecules of that species are deprotonated; that is, [protonated version of the ionizable group] = [deprotonated version of the ionizable group] or  $[HA] = [A]$ . If the pH is less than the pKa, a majority of the species will be protonated. If the pH is higher than the pKa, a majority of the species will be deprotonated. Like all polyprotic acids, each ionizable proton has its own pKa at which it is Protonation and Deprotonation. Because all amino acids have at least two groups that can be deprotonated, they all have at least two pKa values. The first one, pKa1, is the pKa for the carboxyl group and is usually around 2. For most amino acids, the second pKa value, pKa2, is the pKa for the amino group, which is usually between 9 and 10. For amino acids with an ionizable side chain, there will be three pKa values, but we'll come back to that later. As an example, let's take glycine, which doesn't have an ionizable side chain.

**Positively Charged under Acidic Conditions**

At pH 1 (below even the pH of the stomach), there are plenty of protons in solution. Because we're far below the pKa of the amino group, the amino group will be fully protonated ( $NH_3^+$ ) and thus positively charged. Because we're also below the pKa of the carboxylic acid group, it too will be fully protonated ( $COOH$ ) and thus neutral. Therefore, at very acidic pH values, amino acids tend to be positively charged, as shown in Figure 1.5.

**Figure 1.5 Amino Acid Structure at Acidic pH**

**Zwitterions at Intermediate pH**

If we increase the pH of the amino acid solution from pH 1 to pH 7.4, the normal pH of human blood, we've moved far above the pKa of the carboxylic acid group. At physiological pH, you will not find amino acids with the carboxylate group protonated ( $COOH$ ) and the amino group unprotonated ( $NH_2$ ). Under these conditions, the carboxyl group will be in its conjugate base form and be deprotonated, becoming  $COO^-$ . Conversely, we're still well below the pKa of the basic amino group, so it will remain fully protonated and in its conjugate acid form ( $NH_3^+$ ). Thus, we have a molecule

that has both a positive charge and a negative charge, but overall, the molecule is electrically neutral. We call such molecules dipolar ions, or zwitterions (from the German *zwitter*, or “hybrid”), as depicted in Figure 1.6. The two charges neutralize one another, and zwitterions exist in water as Figure 1.6 Carboxylic Acids Become Deprotonated at Neutral pH, Forming Negatively Charged under Basic Conditions Milk of magnesia, which is often used as an antacid, has a pH around 10.5. At that pH, the carboxylate group is already deprotonated and thus remains  $\text{COO}^-$ . On the other hand, we are now well above the  $\text{pK}_a$  for the amino group, so it deprotonates too, becoming  $\text{NH}_2$ . So, at highly basic pH, glycine is now negatively charged, as depicted in Figure 1.7. Figure 1.7 Amino Groups Become Deprotonated at Basic pH, Forming an At very acidic pH values, amino acids tend to be positively charged. At very alkaline pH values, amino acids tend to be negatively charged. Titration of Amino Acids Because of these acid–base properties, amino acids are great candidates for titrations. We assume that the titration of each proton occurs as a distinct step, resembling that of a simple monoprotic acid. Thus, the titration curve looks like a combination of two monoprotic acid titration curves (or three curves, if the side chain is charged). Figure 1.8 shows the titration curve for glycine. After we inspect this curve, we’ll look at the differences for the amino acids with charged side chains. Figure 1.8 Titration Curve for Glycine When the pH of a solution is approximately equal to the  $\text{pK}_a$  of the solute, the solution acts as a buffer. Imagine an acidic 1 M glycine solution. At low pH values, glycine exists predominantly as  $^+\text{NH}_3\text{CH}_2\text{COOH}$ ; it is fully protonated, with a positive charge. As the solution is titrated with  $\text{NaOH}$ , the carboxyl group will deprotonate first because it is more acidic than the amino group. When 0.5 equivalents of base have been added to the solution, the concentrations of the fully protonated glycine and its zwitterion,  $^+\text{NH}_3\text{CH}_2\text{COO}^-$ , are equal; that is,  $[^+\text{NH}_3\text{CH}_2\text{COOH}] = [^+\text{NH}_3\text{CH}_2\text{COO}^-]$ . At this point, the pH equals  $\text{pK}_{a1}$ . Remember: when the pH is close to the  $\text{pK}_a$  value of a solute, the solution is acting as a buffer and the titration curve is relatively flat, as demonstrated in the blue boxes in the diagram. As we add more base, the carboxylate group goes from half-deprotonated to fully deprotonated. The amino acid stops acting like a buffer, and pH

starts to increase rapidly during this phase. When we've added 1.0 equivalent of base, glycine exists exclusively as the zwitterion form (remember, we started with 1.0 equivalent of glycine). This means that every molecule is now electrically neutral, and thus the pH equals the isoelectric point (pI) of glycine. This is true of all amino acids: the isoelectric point is the pH at which the molecule is electrically neutral. For neutral amino acids, it can be calculated by averaging the two pKa values for the amino and carboxyl groups. When the pH of an amino acid solution equals the isoelectric point (pI) of the amino acid, it exists as electrically neutral molecules. The pI is calculated as the average of the two nearest pKa values. For amino acids with non-ionizable side chains, the pI is usually around  $pI_{\text{neutral amino acid}} = \frac{pK_{a,\text{COOH group}} + pK_{a,\text{NH}_3^+ \text{ group}}}{2}$ . For glycine, the pI value is  $(2.34 + 9.60) \div 2 = 5.97$ . Remember that when the molecule is neutral, it is especially sensitive to pH changes, and the titration curve is nearly vertical. As we continue adding base, glycine passes through a second buffering phase as the amino group deprotonates; again, the pH remains relatively constant. When 1.5 equivalents of base have been added, the concentration of the zwitterion form equals the concentration of the fully deprotonated form; that is,  $[+NH_3CH_2COO^-] = [NH_2CH_2COO^-]$ , and the pH equals pKa2. Once again, the titration curve is nearly horizontal. Finally, when we've added 2.0 equivalents of base, the amino acid has become fully deprotonated, and all that remains is  $NH_2CH_2COO^-$ ; additional base will only increase the pH further.

### Amino Acids with Charged Side Chains

For amino acids with charged side chains, such as glutamic acid and lysine, the titration curve has an extra "step," but works along the same principles as. Because glutamic acid has two carboxyl groups and one amino group, its charge in its fully protonated state is still +1. It undergoes the first deprotonation, losing the proton from its main carboxyl group, just as glycine does. At that point, it is electrically neutral. When it loses its second proton, just as with glycine, its overall charge will be 1-. However, the second proton that is removed in this case comes from the side chain carboxyl group, not the amino group! This is a relatively acidic group, with a pKa of around 4.2. The result is that the pI of glutamic acid is much lower than that of glycine, around 3.2. The isoelectric point for an acidic amino acid can be

calculated as follows:  $pI_{\text{acidic amino acid}} = \frac{pK_a(\text{R group}) + pK_a(\text{COOH group})}{2}$  Lysine, on the other hand, has two amino groups and one carboxyl group. Thus, its charge in its fully protonated state is +2, not +1. Losing the carboxyl proton, which still happens around pH 2, brings the charge down to +1. Lysine does not become electrically neutral until it loses the proton from its main amino group, which happens around pH 9. It gets a negative charge when it loses the proton on the amino group in its side chain, which happens around pH 10.5. Thus, the isoelectric point of lysine is the average of the  $pK_a$  values for the amino group and side chain; the  $pI$  is around 9.75. The isoelectric point for a basic amino acid can be calculated as follows: Amino acids with acidic side chains have  $pI$  values well below 6; amino acids with basic side chains have  $pI$  values well above 6.  $pI_{\text{basic amino acid}} = \frac{pK_a(\text{R group}) + pK_a(\text{side chain})}{2}$

The take-home message: amino acids with acidic side chains have relatively low isoelectric points, while those with basic side chains have relatively high

### MCAT CONCEPT CHECK 1.2

Before you move on, assess your understanding of the material with these questions.

- For a generic amino acid,  $\text{NH}_2\text{CRHCOOH}$ , with an uncharged side chain, what would be the predominant form at each of the following pH values? pH = 1: pH = 7: pH = 11:
- Given the following  $pK_a$  values, what is the value of the  $pI$  for each of the amino acids listed below?
 

Aspartic acid ( $pK_{a1} = 1.88$ , $pK_{a2} = 3.65$ , $pK_{a3} = 9.60$ ) : $pI =$	Arginine ( $pK_{a1} = 2.17$ , $pK_{a2} = 9.04$ , $pK_{a3} = 12.48$ ) : $pI =$
Valine ( $pK_{a1} = 2.32$ , $pK_{a2} = 6.62$ ) : $pI =$	_____

### 1.3 Peptide Bond Formation and Hydrolysis

After Chapter 1.3, you will be able to:

- Recognize the relationship of nomenclature with length, such as predicting the length of a compound called a "tripeptide"
- Apply the hydrolytic mechanisms of trypsin and chymotrypsin to novel peptide
- Predict the products of peptide bond formation and cleavage reactions: Peptides are composed of amino acid subunits, sometimes called residues, as shown in Figure 1.9. Dipeptides consist of two amino acid residues; tripeptides have three. The term oligopeptide is used for relatively small peptides, up to about 20 residues; while longer chains are called

### Figure 1.9 Peptide Residues

The residues in peptides are joined together through peptide bonds, a specialized form of an amide bond, which form between the COO group of one amino acid and the  $\text{NH}_2$  group

of another amino acid. This forms the functional group  $C(O)NH$ . In this section, we'll look at the key reactions involved in forming and breaking peptide bonds. For Test Day, you also need to know how peptide bonds are formed in the context of ribosomes, which is covered in Chapter 7 of MCAT Biochemistry Review.

### Peptide Bond Formation

Peptide bond formation is an example of a condensation or dehydration reaction because it results in the removal of a water molecule ( $H_2O$ ); it can also be viewed as an acyl substitution reaction, which can occur with all carboxylic acid derivatives. When a peptide bond forms, as shown in Figure 1.10, the electrophilic carbonyl carbon on the first amino acid is attacked by the nucleophilic amino group on the second amino acid. After that attack, the hydroxyl group of the carboxylic acid is kicked off. The result is the formation of a peptide (amide) bond.

### Figure 1.10 Peptide Bond Formation and Cleavage

Because amide groups have delocalizable  $\pi$  electrons in the carbonyl and in the lone pair on the amino nitrogen, they can exhibit resonance; thus, the  $CN$  bond in the amide has partial double bond character, as shown in Figure 1.11

### Resonance in the Peptide Bond

The peptide is drawn in the same order that it is synthesized by ribosomes: from the N-terminus to the C-terminus! Translation is covered in Chapter 7 of MCAT Biochemistry

As a result, rotation of the protein backbone around its  $CN$  amide bonds is restricted, which makes the protein more rigid. Rotation around the remaining bonds in the backbone, however, is not restricted, as those remain single ( $\sigma$ ) bonds. When a peptide bond forms, the free amino end is known as the amino terminus or N-terminus, while the free carboxyl end is the carboxy terminus or C-terminus. By convention, peptides are drawn with the N-terminus on the left and the C-terminus on the right; similarly, they are read from N-terminus to C-terminus. You do not need to memorize the specific amino acids that hydrolytic enzymes recognize or the exact mechanisms for those reactions. On the other hand, you could certainly encounter a passage describing them.

### Peptide Bond Hydrolysis

For enzymes to carry out their function, peptides need to be relatively stable in solution. Therefore, they don't normally fall apart on their own. On the other hand, in order to digest proteins, we need to break them down into their component amino acids. In organic chemistry, amides can be hydrolyzed

using acid or base catalysis. In living organisms, however, hydrolysis is catalyzed by hydrolytic enzymes such as trypsin and chymotrypsin. Both are specific, in that they only cleave at specific points in the peptide chain: trypsin cleaves at the carboxyl end of arginine and lysine, while chymotrypsin cleaves at the carboxyl end of phenylalanine, tryptophan, and tyrosine. While you don't need to know the exact mechanism of how these enzymes catalyze hydrolysis, you do need to understand the main idea: they break apart the amide bond by adding a hydrogen atom to the amide nitrogen and an OH group to the carbonyl carbon. This is the reverse reaction shown before in Figure 1.10.

**MCAT CONCEPT CHECK 1.3** Before you move on, assess your understanding of the material with these questions.

1. What is the difference between an amino acid, a dipeptide, a tripeptide, an oligopeptide, and a polypeptide?
2. What molecule is released during formation of a peptide bond?
3. If chymotrypsin cleaves at the carboxyl end of phenylalanine, tryptophan, and tyrosine, how many oligopeptides would be formed in enzymatic cleavage of the following molecule with chymotrypsin? Val Phe Glu Lys Tyr Phe Trp Ile Met Tyr Gly Ala

#### 1.4 Primary and Secondary Protein Structure

After Chapter 1.4, you will be able to:

- Describe all four levels of protein structure
- Recognize the unique role of proline in secondary protein structure
- Recall the structural features of  $\alpha$ -helices and  $\beta$ -pleated sheets

Proteins are polypeptides that range from just a few amino acids in length up to thousands. They serve many functions in biological systems, functioning as enzymes, hormones, membrane pores and receptors, and elements of cell structure. Proteins are the main actors in cells; the genetic code, after all, is simply a recipe for making thousands of proteins. Proteins have four levels of structure: primary ( $1^\circ$ ), secondary ( $2^\circ$ ), tertiary ( $3^\circ$ ), and quaternary ( $4^\circ$ ). In this section, we'll examine the first two; we'll discuss tertiary and quaternary structure in the next section. The MCAT will not expect you to memorize the exact primary sequence of any protein! The primary structure of a protein is the linear arrangement of amino acids coded in an organism's DNA. It's the sequence of amino acids, listed from the N-terminus, or amino end, to the C-terminus, or carboxyl end. So, for example, the first ten amino acids of the  $\beta$ -chain of hemoglobin are normally valine, histidine,

leucine, threonine, proline, glutamate, glutamate, lysine, serine, and alanine. Primary structure is stabilized by the formation of covalent peptide bonds between adjacent amino acids. The primary structure of a protein is the order of its amino acids. The two main secondary structures are the  $\alpha$ -helix and  $\beta$ -pleated sheet, which both result from hydrogen bonding. The primary structure alone encodes all the information needed for folding at all of the higher structural levels; the secondary, tertiary, and quaternary structures a protein adopts are the most energetically favorable arrangements of the primary structure in a given environment. The primary structure of a protein can be determined by a laboratory technique called sequencing. This is most easily done using the DNA that coded for that protein, although it can also be done from the protein itself. A protein's secondary structure is the local structure of neighboring amino acids. Secondary structures are primarily the result of hydrogen bonding between nearby amino acids. The two most common secondary structures are  $\alpha$ -helices and  $\beta$ -pleated sheets. The key to the stability of both structures is the formation of intramolecular hydrogen bonds between

The  $\alpha$ -helix, shown in Figure 1.12, is a rodlike structure in which the peptide chain coils clockwise around a central axis. The helix is stabilized by intramolecular hydrogen bonds between a carbonyl oxygen atom and an amide hydrogen atom four residues down the chain. The side chains of the amino acids in the  $\alpha$ -helical conformation point away from the helix core. The  $\alpha$ -helix is an important component in the structure of keratin, a fibrous structural protein found in human skin, hair, and fingernails.

Figure 1.12 Hydrogen Bonding and Spatial Configuration of an  $\alpha$ -Helix In  $\beta$ -pleated sheets, which can be parallel or antiparallel, the peptide chains lie alongside one another, forming rows or strands held together by intramolecular hydrogen bonds between carbonyl oxygen atoms on one chain and amide hydrogen atoms in an adjacent chain, as shown in Figure 1.13. To accommodate as many hydrogen bonds as possible, the  $\beta$ -pleated sheets assume a pleated, or rippled, shape. The R groups of amino residues point above and below the plane of the  $\beta$ -pleated sheet. Fibroin, the primary protein component of silk fibers, is composed of  $\beta$ -pleated sheets.

Figure 1.13 Hydrogen Bonding and Spatial Configuration of a

$\beta$ -Pleated Sheet Secondary Structures and Proline Because of its rigid cyclic structure, proline will introduce a kink in the peptide chain when it is found in the middle of an  $\alpha$ -helix. Proline residues are thus rarely found in  $\alpha$ -helices, except in helices that cross the cell membrane. Similarly, it is rarely found in the middle of pleated sheets. On the other hand, proline is often found in the turns between the chains of a  $\beta$ -pleated sheet, and it is often found as the residue at the start of an  $\alpha$ -helix.

MCAT CONCEPT CHECK 1.4 Before you move on, assess your understanding of the material with these questions.

1. What are the definitions of primary and secondary structure, and how do they differ in subtypes and the bonds that stabilize them?

Primary structure ( $1^\circ$ ) Secondary structure ( $2^\circ$ )

2. What role does proline serve in secondary structure?
3. Describe the key structural features of the following secondary structures.

1.5 Tertiary and Quaternary Protein After Chapter 1.5, you will be able to:

- Identify the major structural components of tertiary and quaternary protein structure
- Recognize the relationship between protein folding and the solvation layer
- Recall the nomenclature of proteins with prosthetic groups, such as nucleoproteins

Proteins can be broadly divided into fibrous proteins, such as collagen, that have structures that resemble sheets or long strands, and globular proteins, such as myoglobin, that tend to be spherical (that is, like a globe). These are caused by tertiary and quaternary protein structures, both of which are the result of protein folding. The tertiary structure of a protein is primarily the result of moving hydrophobic amino acid side chains into the interior of the protein. A protein's tertiary structure is its three-dimensional shape. Tertiary structures are mostly determined by hydrophilic and hydrophobic interactions between R groups of amino acids. Hydrophobic residues prefer to be on the interior of proteins, which reduces their proximity to water. Hydrophilic NH and C=O bonds found in the polypeptide chain get pulled in by these hydrophobic residues. These hydrophilic bonds can then form electrostatic interactions and hydrogen bonds that further stabilize the protein from the inside. As a result of these hydrophobic interactions, most of the amino acids on the surface of proteins have hydrophilic (polar or charged) R groups; highly hydrophobic R groups, such as phenylalanine, are almost never found on the surface of a



protein. The three-dimensional structure can also be determined by hydrogen bonding, as well as acid–base interactions between amino acids with charged R groups, creating salt bridges. A particularly important component of tertiary structure is the presence of disulfide bonds, the bonds that form when two cysteine molecules become oxidized to form cystine, as shown in Figure 1.14. Disulfide bonds create loops in the protein chain. In addition, disulfide bonds determine how wavy or curly human hair is: the more disulfide bonds, the curlier it is. Note that forming a disulfide bond requires the loss of two protons and two electrons (oxidation).

**Figure 1.14 Disulfide Bond Formation** The exact details of protein folding are beyond the scope of the MCAT, but the basic idea is that the secondary structures probably form first, and then hydrophobic interactions and hydrogen bonds cause the protein to “collapse” into its proper three-dimensional structure. Along the way, it adopts intermediate states known as molten globules. Protein folding is an extremely rapid process: from start to finish, it typically takes much less than If a protein loses its tertiary structure, a process commonly called denaturation, it loses its function. Make sure you understand the basic thermodynamic properties of enthalpy, entropy, and Gibbs free energy, discussed in Chapter 7 of MCAT General Chemistry Review. On Test Day, they can be tested on both natural sciences sections!

**Folding and the Solvation Layer** Why do hydrophobic residues tend to occupy the interior of a protein, while hydrophilic residues tend to accumulate on the exterior portions? The answer can be summed up in one word: entropy. Whenever a solute dissolves in a solvent, the nearby solvent molecules form a solvation layer around that solute. From an enthalpy standpoint, even hydrocarbons are more stable in aqueous solution than in organic ones ( $\Delta H < 0$ ). However, when a hydrophobic side chain, such as those in phenylalanine and leucine, is placed in aqueous solution, the water molecules in the solvation layer cannot form hydrogen bonds with the side chain. This forces the nearby water molecules to rearrange themselves into specific arrangements to maximize hydrogen bonding—which means a negative change in entropy,  $\Delta S$ . Remember that negative changes in entropy represent increasing order (decreasing disorder) and thus are unfavorable. This entropy change makes

the overall process nonspontaneous ( $\Delta G > 0$ ). On the other hand, putting hydrophilic residues such as serine or lysine on the exterior of the protein allows the nearby water molecules more latitude in their positioning, thus increasing their entropy ( $\Delta S > 0$ ), and making the overall solvation process spontaneous. Thus, by moving hydrophobic residues away from water molecules and hydrophilic residues toward water molecules, a protein achieves maximum stability. The primary structure of a protein acts like letters. The secondary structure acts like words: only certain orderings of letters make sense (CAT is a word, while CAQ is not). The tertiary structure acts like sentences: words combine to form a functioning whole. The quaternary structure acts like paragraphs: they're not always present, but subunits can combine to make a cohesive whole. All proteins have elements of primary, secondary, and tertiary structure; not all proteins have quaternary structure. Quaternary structures only exist for proteins that contain more than one polypeptide chain. For these proteins, the quaternary structure is an aggregate of smaller globular peptides, or subunits, and represents the functional form of the protein. The classic examples of quaternary structure are hemoglobin and immunoglobulins, shown in Figures 1.15a and 1.15b. Hemoglobin consists of four distinct subunits, each of which can bind one molecule of oxygen. Similarly, immunoglobulin G (IgG) antibodies also contain a total of four subunits. Figure 1.15a Hemoglobin Heme molecules are visible in each chain. Figure 1.15b Immunoglobulin G

The reduction of genetic material is crucial for viruses. The genome for most viruses is tiny. Thus, their viral coats typically consist of one small protein repeated dozens or even hundreds of times. Viral structure is discussed in Chapter 1 of MCAT Biology Review. The formation of quaternary structures can serve several roles. First, they can be more stable, by further reducing the surface area of the protein complex. Second, they can reduce the amount of DNA needed to encode the protein complex. Third, they can bring catalytic sites close together, allowing intermediates from one reaction to be directly shuttled to a second reaction. Finally, and most important, they can induce cooperativity, or allosteric effects. We'll discuss this much further in the next chapter (especially for hemoglobin), but the basic idea is that one subunit can undergo conformational

or structural changes, which either enhance or reduce the activity of the other subunits. Conjugated proteins derive part of their function from covalently attached molecules called prosthetic groups. These prosthetic groups can be organic molecules, such as vitamins, or even metal ions, such as iron. Proteins with lipid, carbohydrate, and nucleic acid prosthetic groups are referred to as lipoproteins, glycoproteins, and nucleoproteins, respectively. These prosthetic groups have major roles in determining the function of their respective proteins. For example, each of hemoglobin's subunits (as well as myoglobin) contains a prosthetic group called heme. The heme group, which contains an iron atom in its core, binds to and carries oxygen; as such, hemoglobin is inactive without the heme group. These groups can also direct the protein to be delivered to a certain location, such as the cell membrane, nucleus, lysosome, or endoplasmic reticulum.

**BIOCHEMISTRY GUIDED EXAMPLE WITH EXPERT**

Ricin is a highly toxic ribosome-inactivating protein (RIP) that can be obtained easily from the widely available castor bean, *Ricinus communis*, making it a potential bioterrorist and biowarfare agent. There is no known antidote, but toxoid and recombinant vaccines have been shown to be effective in raising protective immunity and preventing the lethal effects of ricin.

**background info on ricin and vaccines**

Currently, variants of ricin that do not bind to ribosomes exist, and show promising results as a human immunogen in Phase 1 clinical trials. However, the vaccines suffer from instability and aggregation, and can still cause serious effects like vascular leak syndrome (VLS). Based on previous x-ray crystal structures of RTA1-33/44-198 (an inactive variant), introduction of a disulfide bond stabilizes a disordered loop. However, it is unclear whether the mutations made to introduce the disulfide bond improve overall protein stability and how the mutant proteins interact with VLS receptors in animal tissue with current bonds, which may help with stability.

A series of RTA1-33/44-198 mutants were created and purified. The number of free cysteines were assayed using Ellman's reagent, which reacts with free sulfhydryl groups to yield a colored product. The melting temperature (apparent  $T_m$ ) of each purified protein was determined using circular dichroism measurements. Finally, each construct was assayed for its ability to induce VLS in animal

models. The results are detailed in Table 1 cysteines (via assay), and ability to induce free Cys and a Tm similar to Adapted from Janosi, L., Compton, J. R., Legler, P. M., Steele, K. E., Davis, J. M., Matyas, G. R., & Millard, C. B. (2013). Disruption of the putative vascular leak peptide sequence in the stabilized ricin vaccine candidate RTA1-33/44-198. *Toxins*, 5(2), 224-48. Is R48C/T77C/V76I a suitable candidate for further testing? Why or why not? This question is asking us to interpret the study results, but we'll want to start with the purpose of the study to be able to go through the data efficiently. The goal is to develop a vaccine for ricin poisoning. The second paragraph starts with what has already been done, which is the creation of a possible working vaccine. Since it's based on the ricin protein, we can use our background knowledge and critical reasoning to assume that the vaccine is similar enough to the ricin protein to elicit a proper immune response, but does not inhibit ribosome function. Notice the keyword "however" in the second paragraph—this indicates that there is still a problem. In this case, the current vaccine is not stable, which would presumably affect its efficacy. Also, the vaccine seems to have a serious side effect (VLS), which is something the researchers want to eliminate. We're given a hint about a possible solution to the stability issue—creating a disulfide bond. This means that the disulfide is not native to the protein, but created by mutating select amino acids to cysteines. Following that possible solution in paragraph 2, the researchers generated a series of protein mutations, which are outlined in the first column of Table 1. Notice the notation: letter-number-letter. We know from the passage that these are mutants and, in looking at this code, we can infer that the first letter is the original amino acid, the number is its position in the sequence, and the second letter is the mutated amino acid. This style of notation is common in scientific papers, so we'll likely want to keep this in mind even on Test Day as a possibility when we see similar notation. For instance, R48C is arginine at position 48 mutated to cysteine. Notice that in each mutation, there is a pair of amino acids mutated to cysteine to create the opportunity for a disulfide bond. The second column tells us about the success of creating a disulfide bond. Since the wild-type protein has one free cysteine, and the mutants introduce two more cysteines for the purpose of a creating a

disulfide bond, a successful disulfide bond formation will eliminate two sulfhydryls, leaving the original free cysteine. R48C/T77C/V76I has approximately two ( $1.89 \pm 0.03$ ) free cysteines, suggesting an incomplete formation of the disulfide bond. The third column determines the effect of the disulfide bond formation on stability. Melting temperature ( $T_m$ ) is a great indication for stability—the higher the temperature, the more energy it takes to break all bonds to unfold the protein. Both wild-type and R48C/T77C/V76I have markedly lower  $T_m$  compared to the other constructs, which we can conclude means they have reduced stability. Finally, the last column provides information about whether the construct induced VLS. We can see that R48C/T77C/V76I did not induce VLS, making it 'safer' from the perspective of risk for this dangerous syndrome. Given the data from the passage, while R48C/T77C/V76I does address the issue of not inducing VLS in animal models, the construct is not stable, and therefore would not be suitable for additional testing.

MCAT CONCEPT CHECK 1.5 Before you move on, assess your understanding of the material with these questions.

1. What are the definitions of tertiary and quaternary structure, and how do they differ in subtypes and the bonds that stabilize them? Tertiary structure ( $3^\circ$ ) Quaternary structure ( $4^\circ$ )
2. What is the primary motivation for hydrophobic residues in a polypeptide to move to the interior of the protein?
3. List three different prosthetic groups that can be attached to a protein and name the

After Chapter 1.6, you will be able to: Predict the impact of denaturation via heat or solute

Heat denatures proteins for the same reason that raising a reaction's temperature increases its rate: increased average kinetic energy of molecules means increased molecular motion. The relationship between temperature and kinetic energy is discussed in Chapter 7 of MCAT General Chemistry Review. In the previous section, we discussed protein folding. The reverse of this process is denaturation, in which a protein loses its three-dimensional structure. Although it is sometimes reversible, denaturation is often irreversible; whether its denaturation is reversible or not, unfolded proteins cannot catalyze reactions. The two main causes of denaturation are heat and As with all molecules, when the temperature of a protein increases, its average kinetic energy increases. When the temperature gets high enough, this

extra energy can be enough to overcome the hydrophobic interactions that hold a protein together, causing the protein to unfold. This is what happens when egg whites are cooked: in the uncooked egg whites, albumin is folded, which makes it transparent; cooking them causes the albumin molecules to denature and aggregate, forming a solid, rubbery white mass that will not revert to its transparent form. On the other hand, solutes such as urea denature proteins by directly interfering with the forces that hold the protein together. They can disrupt tertiary and quaternary structures by breaking disulfide bridges, reducing cystine back to two cysteine residues. They can even overcome the hydrogen bonds and other side chain interactions that hold  $\alpha$ -helices and  $\beta$ -pleated sheets intact. Similarly, detergents such as SDS (sodium dodecyl sulfate, also called sodium lauryl sulfate) can solubilize proteins, disrupting noncovalent bonds and promoting denaturation. Denatured proteins lose their three-dimensional structure and are thus inactive.

MCAT CONCEPT CHECK 1.6 Before you move on, assess your understanding of the material with this question. 1. Why are proteins denatured by heat and solutes, respectively? Nearly every part of a cell involves proteins in some way, from the nucleus to the mitochondria to the cell membrane. The MCAT will test your understanding of key concepts regarding amino acids because the amino acids that compose a protein determine its structure. In the next chapter, we'll discuss the best-known function of proteins: their role as enzymes. You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources!

**Amino Acids Found in Proteins** Amino acids have four groups attached to a central ( $\alpha$ ) carbon: an amino group, a carboxylic acid group, a hydrogen atom, and an R. The R group determines chemistry and function of that amino acid. Twenty amino acids appear in the proteins of eukaryotic organisms. The stereochemistry of the  $\alpha$ -carbon is L for all chiral amino acids in D-amino acids can exist in prokaryotes. All chiral amino acids except cysteine have an (S) configuration. All amino acids are chiral except glycine, which has a hydrogen atom as its R group. Side chains can be polar or nonpolar, aromatic or nonaromatic, charged or uncharged.

Nonpolar, nonaromatic: glycine, alanine, valine, leucine, isoleucine, methionine, proline

Aromatic: tryptophan, phenylalanine, tyrosine Polar: serine, threonine, asparagine, glutamine, cysteine Negatively charged (acidic): aspartate, glutamate Positively charged (basic): lysine, arginine, histidine Amino acids with long alkyl chains are hydrophobic, and those with charges are hydrophilic; many others fall somewhere in between.

### Acid-Base Chemistry of Amino Acids

Amino acids are amphoteric; that is, they can accept or donate The pKa of a group is the pH at which half of the species are deprotonated;  $[HA] = [A]$ . Amino acids exist in different forms at different pH values. At low (acidic) pH, the amino acid is fully protonated. At pH near the pI of the amino acid, the amino acid is a neutral At high (alkaline) pH, the amino acid is fully deprotonated. The isoelectric point (pI) of an amino acid without a charged side chain can be calculated by averaging the two pKa values. Amino acids can be titrated. The titration curve is nearly flat at the pKa values of the amino acid. The titration curve is nearly vertical at the pI of the amino acid. Amino acids with charged side chains have an additional pKa value, and their pI is calculated by averaging the two pKa values that correspond to protonation and deprotonation of the zwitterion. Amino acids without charged side chains have a pI around 6. Acidic amino acids have a pI well below 6. Basic amino acids have a pI well above 6.

### Peptide Bond Formation and Hydrolysis

Dipeptides have two amino acid residues; tripeptides have three. Oligopeptides have a "few" amino acid residues (<20); polypeptides have "many" (>20). Forming a peptide bond is a condensation or dehydration reaction (releasing one molecule of water). The nucleophilic amino group of one amino acid attacks the electrophilic carbonyl group of another amino acid. Amide bonds are rigid because of resonance. Breaking a peptide bond is a hydrolysis reaction.

### Primary and Secondary Protein Structure

Primary structure is the linear sequence of amino acids in a peptide and is stabilized by peptide bonds. Secondary structure is the local structure of neighboring amino acids, and is stabilized by hydrogen bonding between amino groups and nonadjacent carboxyl groups.  $\alpha$ -helices are clockwise coils around a central axis.  $\beta$ -pleated sheets are rippled strands that can be parallel or Proline can interrupt secondary structure because of its rigid cyclic

### Tertiary and Quaternary Protein Structure

Tertiary structure is the three-dimensional shape of a single polypeptide chain, and

is stabilized by hydrophobic interactions, acid-base interactions (salt bridges), hydrogen bonding, and disulfide bonds. Hydrophobic interactions push hydrophobic R groups to the interior of a protein, which increases entropy of the surrounding water molecules and creates a negative Gibbs free energy. Disulfide bonds occur when two cysteine molecules are oxidized and create a covalent bond to form cystine. Quaternary structure is the interaction between peptides in proteins that contain multiple subunits. Proteins with covalently attached molecules are termed conjugated proteins. The attached molecule is a prosthetic group, and may be a metal ion, vitamin, lipid, carbohydrate, or nucleic acid. Both heat and increasing solute concentration can lead to loss of three-dimensional protein structure, which is termed denaturation.

Answers to Concept Checks 1. The four groups are an amino group ( $\text{NH}_2$ ), a carboxylic acid group ( $\text{COOH}$ ), a hydrogen atom, and an R group. 2. All chiral eukaryotic amino acids are L. All chiral eukaryotic amino acids are (S), with the exception of cysteine (because cysteine is the only amino acid with an R group that has a higher priority than a carboxylic acid according to Cahn-Ingold-Prelog rules). 3. Nonpolar, nonaromatic: glycine, alanine, valine, leucine, isoleucine, Aromatic: tryptophan, phenylalanine, tyrosine Polar: serine, threonine, asparagine, glutamine, cysteine Negatively charged/acidic: aspartate, glutamate Positively charged/basic: lysine, arginine, histidine 4. Hydrophobic amino acids tend to reside in the interior of a protein, away from water. Hydrophilic amino acids tend to remain on the surface of the protein, in contact with water. 5. From left to right the amino acids are methionine (M), cysteine (C), alanine (A), and threonine (T): MCAT. 1.  $\text{pH} = 1$ :  $^+\text{NH}_3\text{CRHCOOH}$ ;  $\text{pH} = 7$ :  $^+\text{NH}_3\text{CRHCOO}^-$ ;  $\text{pH} = 11$ : 2. Aspartic acid:  $\text{pI} = (1.88 + 3.65) \div 2 = 2.77$  Arginine:  $\text{pI} = (9.04 + 12.48) \div 2 = 10.76$  Valine:  $\text{pI} = (2.32 + 9.62) \div 2 = 5.97$  1. These species differ by the number of amino acids that make them up: amino acid = 1, dipeptide = 2, tripeptide = 3, oligopeptide = "few" ( $< 20$ ), polypeptide = "many" ( $> 20$ ) 2. Water ( $\text{H}_2\text{O}$ ) 3. 4: Val Phe; Glu Lys Tyr; Ile Met Tyr; GlyAla. A single amino acid on its own is not considered an oligopeptide. Linear sequence of amino acids in Local structure determined by nearby amino acids 2. Proline's rigid structure causes it to introduce kinks in  $\alpha$ -helices or create turns in  $\beta$ -pleated sheets. 3. The



$\alpha$ -helix is a rod-like structure in which the peptide chain coils clockwise around a central axis. In  $\beta$ -pleated sheets the peptide chains lie alongside one another, forming rows or strands held together by intramolecular hydrogen bonds between carbonyl oxygen atoms on one chain and amide hydrogen atoms in an adjacent chain. Three-dimensional shape of protein

Interaction between separate subunits of a multisubunit protein

2. Moving hydrophobic residues to the interior of a protein increases entropy by allowing water molecules on the surface of the protein to have more possible positions and configurations. This positive  $\Delta S$  makes  $\Delta G < 0$ , stabilizing the protein.

3. Examples of common prosthetic groups include lipids, carbohydrates, and nucleic acids; they are known as lipoproteins, glycoproteins, and

1. Heat denatures proteins by increasing their average kinetic energy, thus disrupting hydrophobic interactions. Solutes denature proteins by disrupting elements of secondary, tertiary, and quaternary structure.

Science Mastery Assessment

Most amino acids (except the acidic and basic amino acids) have two sites for protonation: the carboxylic acid and the amine. At neutral pH, the carboxylic acid will be deprotonated ( $\text{COO}^-$ ) and the amine will remain protonated ( $\text{NH}_3^+$ ).

This dipolar ion is a zwitterion, so (B) is the correct

Glutamic acid is an acidic amino acid because it has an extra carboxyl group. At neutral pH, both carboxyl groups are deprotonated and thus negatively charged. The amino group has a positive charge because it remains protonated at pH 7. Overall, therefore, glutamic acid has a net charge of 1, and (B) is correct.

Notice that you do not even need to know the pI values to solve this question; as an acidic amino acid, glutamic acid must have a pI

Nonpolar groups are not capable of forming dipoles or hydrogen bonds; this makes them hydrophobic. Burying hydrophobic R groups inside proteins means they don't have to interact with water, which is polar. This makes (C) correct.

(A) and (B) are incorrect because nonpolar molecules are hydrophobic, not hydrophilic; (D) is incorrect because they are not generally found on protein surfaces.

The cDNA sequence is a DNA copy of the mRNA used to generate a protein. A computer program can quickly identify the amino acid that corresponds to each codon and generate a list of these amino acids. This amino acid sequence is the primary structure of the protein. These observations support (A) as

the correct answer. By contrast, the secondary, tertiary, and quaternary structures involve higher level interactions between the backbone and R groups and are increasingly difficult to predict. There are three choices for the first amino acid, leaving two choices for the second, and one choice for the third. Multiplying those numbers gives us a total of  $3 \times 2 \times 1 = 6$  distinct tripeptides. (Using the one-letter codes for valine (V), alanine (A), and leucine (L), those six tripeptides are VAL, VLA, ALV, AVL, LVA, and LAV.) As the protein folds, it takes on an organized structure and thus its entropy decreases. However, the opposite trend is true for the water surrounding the protein. Prior to protein folding, hydrophobic amino acid residues are exposed and the water molecules must form structured hydration shells around these hydrophobic residues. During folding, these hydrophobic residues are generally buried in the interior of the protein so that the surrounding water molecules gain more latitude in their interactions. Thus, the entropy of the surrounding water increases, making the correct answer

The  $\alpha$ -helix is held together primarily by hydrogen bonds between the carboxyl groups and amino groups of amino acids. Disulfide bridges, (A), and hydrophobic effects, (B), are primarily involved in tertiary structures, not secondary. Even if they were charged, the side chains of amino acids are too far apart to participate in strong interactions in secondary structure. High salt concentrations and detergents can denature a protein, as can high temperatures. But moving a protein to a hypotonic environment—that is, a lower solute concentration—should not lead to denaturation. An amino acid likely to be found in a transmembrane portion of an  $\alpha$ -helix will be exposed to a hydrophobic environment, so we need an amino acid with a hydrophobic side chain. The only choice that has a hydrophobic side chain is (C), phenylalanine. The other choices are all polar or charged. Every amino acid except glycine has a chiral  $\alpha$ -carbon, but only two of the 20 amino acids—threonine and isoleucine—also have a chiral carbon in their side chains as well. Thus, the correct answer is (C). Just as only one configuration is normally seen at the  $\alpha$  carbon, only one configuration is seen in the side chain chiral carbon. In their inactive state, the receptor tyrosine kinases are fully folded single polypeptide chains and thus have tertiary structure. When these monomers dimerize, they

become a protein complex and thus have elements of quaternary structure. This change from tertiary to quaternary structure Histidine has an ionizable side chain: its imidazole ring has a nitrogen atom that can be protonated. None of the remaining answers have ionizable atoms in their side chains. Because lysine has a basic side chain, we ignore the pKa of the carboxyl group, and average the pKa of the side chain and the amino group; the average of 9 and 10.5 is 9.75, which is closest to (D). Conjugated proteins can have lipid or carbohydrate “tags” added to them. These tags can indicate that these proteins should be directed to the cell membrane (especially lipid tags) or to specific organelles (such as the lysosome). They can also provide the activity of the protein; for example, the heme group in hemoglobin is needed for it to bind oxygen. Thus, (D) is the Because collagen has a triple helix, the carbon backbones are very close together. Thus, steric hindrance is a potential problem. To reduce that hindrance, we need small side chains; glycine has the smallest side chain of all: a hydrogen atom. Consult your online resources for additional practice. Equations to Remember (1.1) Isoelectric point of a neutral amino acid:  $pI_{\text{neutral amino acid}} = \frac{pK_a(\text{COOH group}) + pK_a(\text{R group})}{2}$  (1.2) Isoelectric point of an acidic amino acid:  $pI_{\text{acidic amino acid}} = \frac{pK_a(\text{R group}) + pK_a(\text{COOH group})}{2}$  (1.3) Isoelectric point of a basic amino acid:  $pI_{\text{basic amino acid}} = \frac{pK_a(\text{R group}) + pK_a(\text{COOH group})}{2}$  Biochemistry Chapter 2 Biochemistry Chapter 3 Nonenzymatic Protein Function and Protein Analysis Biochemistry Chapter 7 RNA and the Genetic Code Biology Chapter 1 Biology Chapter 9 The Digestive System General Chemistry Chapter 7 Organic Chemistry Chapter 8 Organic Chemistry Chapter 9 Carboxylic Acid Derivatives Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what’s important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don’t worry though—skipping something now does not mean you’ll never study it. Later on in your prep, as you complete full-length tests, you’ll uncover specific pieces

of content that you need to review and can come back to these chapters as appropriate. How to Use This Assessment If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one. If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect. If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. Consider a biochemical reaction  $A \rightarrow B$ , which is catalyzed by A–B dehydrogenase. Which of the following statements is true? A. The reaction will proceed until the enzyme concentration B. The reaction will be most favorable at 0°C. C. A component of the enzyme is transferred from A to B. D. The free energy change ( $\Delta G$ ) of the catalyzed reaction is the same as for the uncatalyzed reaction.

2. Which of the following statements about enzyme kinetics is A. An increase in the substrate concentration (at constant enzyme concentration) leads to proportional increases in the rate of the reaction. B. Most enzymes operating in the human body work best at a temperature of 37°C. C. An enzyme–substrate complex can either form a product or dissociate back into the enzyme and substrate. D. Maximal activity of many human enzymes occurs around pH 3. Some enzymes require the presence of a nonprotein molecule to behave catalytically. An enzyme devoid of this molecule is called

4. Which of the following factors determine an enzyme’s specificity? A. The three-dimensional shape of the active site B. The Michaelis constant C. The type of cofactor required for the enzyme to be active D. The prosthetic group on the enzyme

5. Human DNA polymerase is removed from the freezer and placed in a 60°C water bath. Which of the following best describes the change in enzyme

activity as the polymerase sample comes to thermal equilibrium with the water bath? A. Increases then decreases B. Decreases then plateaus C. Increases then plateaus D. Decreases then increases

6. In the equation below, substrate C is an allosteric inhibitor to enzyme 1. Which of the following is another mechanism necessarily caused by substrate C? A. Competitive inhibition B. Irreversible inhibition C. Feedback enhancement D. Negative feedback

7. The activity of an enzyme is measured at several different substrate concentrations, and the data are shown in the table V ( mmol V ( mmol  $K_m$  for this enzyme is approximately: Questions 8 and 9 refer to the following statement: Consider a reaction catalyzed by enzyme A with a  $K_m$  value of  $5 \times 10^6$  M and  $v_{max}$  of 20 mmol

8. At a concentration of  $5 \times 10^6$  M substrate, the rate of the reaction A. 10 mmol B. 20 mmol C. 30 mmol D. 40 mmol

9. At a concentration of  $5 \times 10^4$  M substrate, the rate of the reaction A. 10 mmol B. 15 mmol C. 20 mmol D. 30 mmol

10. The graph below shows kinetic data obtained for flu virus enzyme activity as a function of substrate concentration in the presence and absence of two antiviral drugs. Based on the graph, which of the following statements is correct? A. Both drugs are noncompetitive inhibitors of the viral enzyme. B. Oseltamivir increases the  $K_m$  value for the substrate compared C. Zanamivir increases the  $v_{max}$  value for the substrate compared D. Both drugs are competitive inhibitors of the viral enzyme.

11. The conversion of ATP to cyclic AMP and inorganic phosphate is most likely catalyzed by which class of enzyme?

12. Which of the following is NOT a method by which enzymes decrease the activation energy for biological reactions? A. Modifying the local charge environment B. Forming transient covalent bonds C. Acting as electron donors or receptors D. Breaking bonds in the enzyme irreversibly to provide energy

13. A certain enzyme that displays positive cooperativity has four subunits, two of which are bound to substrate. Which of the following statements must be true? A. The affinity of the enzyme for the substrate has just increased. B. The affinity of the enzyme for the substrate has just C. The affinity of the enzyme for the substrate is half of what it would be if four sites had substrate bound. D. The affinity of the enzyme for the substrate is greater than with one substrate bound.

14. Which of the following is LEAST likely to be

required for a series of metabolic reactions? A. Triacylglycerol acting as a coenzyme B. Oxidoreductase enzymes C. Magnesium acting as a cofactor D. Transferase enzymes

15. How does the ideal temperature for a reaction change with and without an enzyme catalyst? A. The ideal temperature is generally higher with a catalyst than B. The ideal temperature is generally lower with a catalyst than C. The ideal temperature is characteristic of the reaction, not the D. No conclusion can be made without knowing the enzyme type.

In This Chapter

2.1 Enzymes as Biological Catalysts Impact on Activation Energy

2.2 Mechanisms of Enzyme Activity Cofactors and Coenzymes

2.3 Enzyme Kinetics Kinetics of Monomeric Enzymes

2.4 Effects of Local Conditions on Enzyme Activity

2.5 Regulation of Enzyme Activity

The content in this chapter should be relevant to about 14% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories: 1A: Structure and function of proteins and their constituent amino acids 5E: Principles of chemical thermodynamics and kinetics

Obesity is increasingly common in the United States and is paralleled by an increase in high blood pressure, or hypertension. This is extremely relevant to medical students because hypertension increases the risk of stroke, heart failure, and kidney failure. Each year, physicians encourage millions of Americans to improve their diets, add exercise to their daily regimens, or even take prescription drugs to control their hypertension. Many of these anti-hypertensive medications are called ACE (angiotensin-converting enzyme) inhibitors. In healthy patients, ACE catalyzes a reaction that converts a peptide called angiotensin I to angiotensin II. The angiotensin II peptide then not only directly causes constriction of the blood vessels to raise blood pressure, but also stimulates the release of the hormone aldosterone, which activates the kidneys to reabsorb more water back into the bloodstream. The increase in blood volume also increases blood pressure. Physicians take advantage of this complicated pathway with a straightforward solution: stop the pathway early by inhibiting ACE and blood pressure will decrease. Enzymes are crucial proteins that dramatically increase the rate of biological reactions. They're used to regulate homeostatic mechanisms in every organ system and are highly regulated themselves by environmental

conditions, activators, and inhibitors. These regulators may be naturally occurring or may be given as a drug, such as the ACE inhibitors used to treat hypertension. Some enzymes are kept in an inactivated form called a zymogen and are only activated as needed. In this chapter, we'll learn about how enzymes work and how different conditions influence their activity. We'll also see how enzymes are regulated, which will help us tie together concepts about every organ system and metabolic process we learn about for 2.1 Enzymes as Biological Catalysts After Chapter 2.1, you will be able to: Explain the major features of enzyme function, including specificity and catalysis Describe all six classes of enzymes: oxidoreductases, transferases, hydrolases, lyases, isomerases, and ligases Recognize how enzymes affect thermodynamics and kinetics of a reaction Enzymes are incredibly important as biological catalysts. Catalysts do not impact the thermodynamics of a biological reaction; that is, the  $\Delta H_{rxn}$  and equilibrium position do not change. Instead, they help the reaction proceed at a much faster rate. As a catalyst, the enzyme is not changed during the course of the reaction. Enzymes increase the reaction rate of a process by a factor of 100, 1000, or even 1,000,000,000,000 ( $10^{12}$ ) times when compared to the uncatalyzed reaction. Without this increase, we wouldn't be alive. Table 2.1 summarizes the key points to remember about enzymes. Table 2.1 Key Features of Enzymes Lower the activation energy Increase the rate of the reaction Do not alter the equilibrium constant Are not changed or consumed in the reaction (which means that they will appear in both the reactants and products) Are pH- and temperature-sensitive, with optimal activity at specific pH ranges and Do not affect the overall  $\Delta G$  of the reaction Are specific for a particular reaction or class of reactions Enzymes are picky. The molecules upon which an enzyme acts are called substrates; a given enzyme will only catalyze a single reaction or class of reactions with these substrates, a property known as enzyme specificity. For example, urease only catalyzes the breakdown of urea. Chymotrypsin, on the other hand, can cleave peptide bonds around the amino acids phenylalanine, tryptophan, and tyrosine in a variety of polypeptides. Although those amino acids aren't identical, they all contain an aromatic ring, which makes chymotrypsin specific for a class of molecules. Enzymes can be classified into six

categories, based on their function or mechanism. We'll review each type of enzyme and give examples of those that you are most likely to see on Test Day. If you encounter an unfamiliar enzyme on the MCAT, keep in mind that most enzymes have descriptive names ending in the suffix *-ase*: lactase, for example, breaks down lactose. The convention for naming reductants and oxidants of oxidoreductases is the same as the convention for naming reducing agents and oxidizing agents in general and organic chemistry. This is a good time to brush up on oxidation-reduction reactions if you haven't seen them in a while—they're covered in Chapter 11 of MCAT General Chemistry Review and Chapter 4 of MCAT Organic Chemistry Review. Oxidoreductases catalyze oxidation-reduction reactions; that is, the transfer of electrons between biological molecules. They often have a cofactor that acts as an electron carrier, such as NAD<sup>+</sup> or NADP<sup>+</sup>. In reactions catalyzed by oxidoreductases, the electron donor is known as the reductant, and the electron acceptor is known as the oxidant. Enzymes with dehydrogenase or reductase in their names are usually oxidoreductases. Enzymes in which oxygen is the final electron acceptor often include oxidase in their names. Transferases catalyze the movement of a functional group from one molecule to another. For example, in protein metabolism, an aminotransferase can convert aspartate and  $\alpha$ -ketoglutarate, as a pair, to glutamate and oxaloacetate by moving the amino group from aspartate to  $\alpha$ -ketoglutarate. Most transferases will be straightforwardly named, but remember that kinases are also a member of this class. Kinases catalyze the transfer of a phosphate group, generally from ATP, to another molecule. Hydrolases catalyze the breaking of a compound into two molecules using the addition of water. In common usage, many hydrolases are named only for their substrate. For example, one of the most common hydrolases you will encounter on the MCAT is a phosphatase, which cleaves a phosphate group from another molecule. Other hydrolases include peptidases, nucleases, and lipases, which break down proteins, nucleic acids, and lipids. Lyases catalyze the cleavage of a single molecule into two products. They do not require water as a substrate and do not act as oxidoreductases. Because most enzymes can also catalyze the reverse of their specific reactions, the synthesis of two molecules into a



single molecule may also be catalyzed by a lyase. When fulfilling this function, it is common for them to be referred to Major Enzyme Classifications: LI'L HOT Isomerases catalyze the rearrangement of bonds within a molecule. Some isomerases can also be classified as oxidoreductases, transferases, or lyases, depending on the mechanism of the enzyme. Keep in mind that isomerases catalyze reactions between stereoisomers as well as constitutional isomers. Ligases catalyze addition or synthesis reactions, generally between large similar molecules, and often require ATP. Synthesis reactions with smaller molecules are generally accomplished by lyases. Ligases are most likely to be encountered in nucleic acid synthesis and repair on Test Day. Gibbs free energy and endergonic/exergonic reactions are covered in Chapter 7 of MCAT General Chemistry Review. Impact on Activation Energy Recall that thermodynamics relates the relative energy states of a reaction in terms of its products and reactants. An endergonic reaction is one that requires energy input ( $\Delta G > 0$ ), whereas an exergonic reaction is one in which energy is given off ( $\Delta G < 0$ ). Remember that endo- means "in" and exo- means "out," so endergonic reactions take in energy as they proceed, whereas exergonic reactions release energy as they proceed. We can look at the reaction diagram in Figure 2.1 to see this demonstrated more clearly. Figure 2.1 Exergonic Reaction Diagram The activation energy required for a catalyzed reaction is lower than that of an uncatalyzed reaction while the  $\Delta G$  (and  $\Delta H$ ) remains the same. The reaction shown in Figure 2.1 is spontaneous. Note that the  $\Delta G$  for this reaction is negative. A very important characteristic of enzymes is that they do not alter the overall free energy change for a reaction, nor do they change the equilibrium of a reaction. Rather, they affect the rate (kinetics) at which a reaction occurs; thus, they can affect how quickly a reaction gets to equilibrium but not the actual equilibrium state itself. For example, a reaction could take years to approach equilibrium without an enzyme. In comparison, with the enzyme, equilibrium might be attained within seconds. Enzymes ensure that many important reactions can occur in a reasonable amount of time in biological systems. Recall that enzymes, as catalysts, are unchanged by the reaction. What is the functional consequence of this? Far fewer copies of the enzyme are required

relative to the overall amount of substrate because one enzyme can act on many, many molecules of substrate over time. Catalysts exert their effect by lowering the activation energy of a reaction; in other words, they make it easier for the substrate to reach the transition state. Imagine having to walk to the other side of a tall hill. The only way to get there is to climb to the top of the hill and then walk down the other side—but wouldn't it be easier if the top of the hill was cut off so one wouldn't have to climb so high? That's exactly what catalysts do for chemical reactions when they make it easier for substrates to achieve their transition state. Most reactions catalyzed by enzymes are technically reversible, although that reversal may be extremely energetically unfavorable and therefore essentially

MCAT CONCEPT CHECK 2.1  
Before you move on, assess your understanding of the material with these questions. 1. How do enzymes function as biological catalysts? 2. What is enzyme specificity? 3. What are the names and main functions of the six different classes of enzymes? 4. In what ways do enzymes affect the thermodynamics vs. the kinetics of a reaction?

2.2 Mechanisms of Enzyme Activity  
After Chapter 2.2, you will be able to: Differentiate between coenzymes and cofactors  
Compare the induced fit and lock and key models of enzyme function  
While enzyme mechanisms will vary depending on the reaction that is being catalyzed, they tend to share some common features. Enzymes may act to provide a favorable microenvironment in terms of charge or pH, stabilize the transition state, or bring reactive groups nearer to one another in the active site. The formation of the enzyme-substrate complex in the active site of an enzyme is the key catalytic activity of the enzyme, which reduces the activation energy of the reaction as described above. This interaction between a substrate and the active site of an enzyme also accounts for the selectivity and some regulatory mechanisms of enzymes. The molecule upon which an enzyme acts is known as its substrate. The physical interaction between these two is referred to as the enzyme-substrate complex. The active site is the location within the enzyme where the substrate is held during the chemical reaction, as shown in Figure 2.2. Figure 2.2 Reaction Catalysis in the Active Site of an Enzyme This transferase has catalyzed the formation of a bond between two substrate molecules. The active site assumes a

defined spatial arrangement in the enzyme– substrate complex, which dictates the specificity of that enzyme for a molecule or group of molecules. Hydrogen bonding, ionic interactions, and transient covalent bonds within the active site all stabilize this spatial arrangement and contribute to the efficiency of the enzyme. Two competing theories explain how enzymes and substrates interact, but one of the two is better supported than the other.

**Lock and Key Theory** The lock and key theory is aptly named. It suggests that the enzyme's active site (lock) is already in the appropriate conformation for the substrate (key) to bind. As shown in Figure 2.3, the substrate can then easily fit into the active site, like a key into a lock or a hand into a glove. No alteration of the tertiary or quaternary structure is necessary upon binding of the substrate.

**Figure 2.3 Lock and Key Theory vs. Induced Fit Model for Enzyme Catalysis**

**Induced Fit Model** The more scientifically accepted theory is the induced fit model; this is the one you are more likely to see referenced on Test Day. Imagine that the enzyme is a foam stress ball and the substrate is a frustrated MCAT student's hand. What's the desired interaction? The student wants to release some stress and relax. As the student's hand squeezes the ball, both change conformation. The ball is no longer spherical and the hand is no longer flat because they adjust to fit each other well. In this case, the substrate (the student) has induced a change in the shape of the enzyme (the stress ball). This interaction requires energy, and therefore, this part of the reaction is endergonic. Once the student lets go of the stress ball, we have our desired product: a relaxed, more confident test taker. Letting go of the stress ball is pretty easy and doesn't require extra energy; so, this part of the reaction is exergonic. Just like enzymes, foam stress balls return to their original shape once their crushers (substrates) let go of them. On a molecular level, demonstrated in Figure 2.3, the induced fit model starts with a substrate and an enzyme active site that don't seem to fit together. However, once the substrate is present and ready to interact with the active site, the molecules find that the induced form, or transition state, is more comfortable for both of them. Thus, the shape of the active site becomes truly complementary only after the substrate begins binding to the enzyme. Similarly, a substrate of the wrong type will not cause the appropriate conformational

shift in the enzyme. Thus, the active site will not be adequately exposed, the transition state is not preferred, and no reaction occurs. Deficiencies in vitamin cofactors can result in devastating disease. Thiamine is an essential cofactor for several enzymes involved in cellular metabolism and nerve conduction. Thiamine deficiency, often a result of excess alcohol consumption and poor diet, results in diseases including Wernicke–Korsakoff syndrome. In this disorder, patients suffer from a variety of neurologic deficits, including delirium, balance problems, and, in severe cases, the inability to form new memories.

### Cofactors and Coenzymes

Many enzymes require nonprotein molecules called cofactors or coenzymes to be effective. These cofactors and coenzymes tend to be small in size so they can bind to the active site of the enzyme and participate in the catalysis of the reaction, usually by carrying charge through ionization, protonation, or deprotonation. Cofactors and coenzymes are usually kept at low concentrations in cells, so they can be recruited only when needed. Enzymes without their cofactors are called apoenzymes, whereas those containing them are holoenzymes. Cofactors are attached in a variety of ways, ranging from weak noncovalent interactions to strong covalent ones. Tightly bound cofactors or coenzymes that are necessary for enzyme function are known as Cofactors and coenzymes are topics that we are likely to see on Test Day, so they are important to know. Cofactors are generally inorganic molecules or metal ions, and are often ingested as dietary minerals. Coenzymes are small organic groups, the vast majority of which are vitamins or derivatives of vitamins such as NAD<sup>+</sup>, FAD, and coenzyme A. The water-soluble vitamins include the B complex vitamins and ascorbic acid (vitamin C), and are important coenzymes that must be replenished regularly because they are easily excreted. The fat-soluble vitamins—A, D, E, and K—are better regulated by partition coefficients, which quantify the ability of a molecule to dissolve in a polar vs. nonpolar environment. Enzymatic reactions are not restricted to a single cofactor or coenzyme. For example, metabolic reactions often require magnesium, NAD<sup>+</sup> (derived from vitamin B3), and biotin (vitamin B7) simultaneously. Vitamins come in two major classes: fat- and water-soluble. This is important to consider in digestive diseases, where different parts of the gastrointestinal tract may be

affected by different disease processes. Because different parts of the gastrointestinal tract specialize in the absorption of different types of biomolecules, loss of different parts of the gastrointestinal tract or its accessory organs may result in different vitamin deficiencies. The digestive system is discussed in Chapter 9 of MCAT Biology Review. The MCAT is unlikely to expect memorization of the B vitamins; however, familiarity with their names may make biochemistry passages easier on Test Day.

**B5: pantothenic acid B6: pyridoxal phosphate B9: folic acid**

**MCAT CONCEPT CHECK 2.2** Before you move on, assess your understanding of the material with these questions.

1. How do the lock and key theory and induced fit model differ? Lock and Key

2. What do cofactors and coenzymes do? How do they differ?

**2.3 Enzyme Kinetics**

After Chapter 2.3, you will be able to:

- Predict how changes in enzyme and solute concentration will affect enzyme kinetics
- Define enzyme cooperativity
- Compare Lineweaver–Burk and Michaelis–Menten plots
- Explain key points on a Lineweaver–Burk or Michaelis–Menten plot:

**Kinetics of Monomeric Enzymes**

Enzyme kinetics is a high-yield topic that can score us several points on Test Day. Just as the relief our student derives from squeezing a stress ball depends on a number of factors, such as size and shape of the ball and the student's baseline level of stress, enzyme kinetics are dependent on factors like environmental conditions and concentrations of substrate and enzyme. The concentrations of the substrate,  $[S]$ , and enzyme,  $[E]$ , greatly affect how quickly a reaction will occur. Let's say that we have 100 stress balls (enzymes) and only 10 frustrated students (substrates) to derive stress relief from them. This represents a high enzyme concentration relative to substrate. Because there are many active sites available, we will quickly form products (students letting go and feeling relaxed); in a chemical sense, we would reach equilibrium quickly. As we slowly add more substrate (students), the rate of the reaction will increase; that is, more people will relax in the same amount of time because we have plenty of available stress balls for them to squeeze. However, as we add more and more people (and start approaching 100 students), we begin to level off and reach a maximal rate of relaxation. There are fewer and fewer available stress balls until finally all active sites are occupied. Unlike before, inviting more students into the

room will not change the rate of the reaction. It cannot go any faster once it has reached saturation. At this rate, the enzyme is working at maximum velocity, denoted by  $v_{max}$ . The only way to increase  $v_{max}$  is by increasing the enzyme concentration. In the cell, this can be accomplished by inducing the expression of the gene encoding the enzyme. These concepts are represented graphically in Figure 2.4.

**Figure 2.4 Michaelis–Menten Plot of Enzyme Kinetics**

As the amount of substrate increases, the enzyme is able to increase its rate of reaction until it reaches a maximum enzymatic reaction rate ( $v_{max}$ ); once  $v_{max}$  is reached, adding more substrate will not increase the rate of reaction. For most enzymes, the Michaelis–Menten equation describes how the rate of the reaction,  $v$ , depends on the concentration of both the enzyme,  $[E]$ , and the substrate,  $[S]$ , which forms product,  $[P]$ . Enzyme–substrate complexes form at a rate  $k_1$ . The ES complex can either dissociate at a rate  $k_{-1}$  or turn into  $E + P$  at a rate  $k_{cat}$ :  $E + S \xrightleftharpoons[k_{-1}]{k_1} ES \xrightarrow{k_{cat}} E + P$ . Note that in either case, the enzyme is again available. On Test Day, the concentration of enzyme will be kept constant. Under these conditions, we can relate the velocity of the enzyme to substrate concentration using the  $K_m + [S]$ . Some important and Test Day–relevant math can be derived from this equation. When the reaction rate is equal to half of  $v_{max}$ ,  $K_m = [S]$ : We can assess an enzyme’s affinity for a substrate by noting the  $K_m$ . A low  $K_m$  reflects a high affinity for the substrate (low  $[S]$  required for 50% enzyme saturation). Conversely, a high  $K_m$  reflects a low affinity of the enzyme for the substrate.  $K_m$  can, therefore, be understood to be the substrate concentration at which half of the enzyme’s active sites are full (half the stress balls are in use).  $K_m$  is the Michaelis constant and is often used to compare enzymes. Under certain conditions,  $K_m$  is a measure of the affinity of the enzyme for its substrate. When comparing two enzymes, the one with the higher  $K_m$  has the lower affinity for its substrate because it requires a higher substrate concentration to be half-saturated. The  $K_m$  value is an intrinsic property of the enzyme–substrate system and cannot be altered by changing the concentration of substrate or enzyme. For a given concentration of enzyme, the Michaelis–Menten relationship generally graphs as a hyperbola, as seen in the Michaelis–Menten plot in Figure 2.4. When substrate concentration is less than

$K_m$ , changes in substrate concentration will greatly affect the reaction rate. At high substrate concentrations exceeding  $K_m$ , the reaction rate increases much more slowly as it approaches  $v_{max}$ , where it becomes independent of substrate. The variable  $v_{max}$  represents maximum enzyme velocity and is measured in moles of enzyme per second. Also,  $v_{max}$  can be mathematically related to  $k_{cat}$ , which has units of  $s^{-1}$ :  $v_{max} = [E]k_{cat}$ . Qualitatively speaking,  $k_{cat}$  measures the number of substrate molecules "turned over," or converted to product, per enzyme molecule per second. Most enzymes have  $k_{cat}$  values between  $10^1$  and  $10^3$ . The Michaelis-Menten equation above can be restated using  $k_{cat}$ :  $v = \frac{k_{cat}[E][S]}{K_m + [S]}$ . At very low substrate concentrations, where  $K_m \gg [S]$ , this derived equation can be further simplified as:  $v = \frac{k_{cat}}{K_m}[E][S]$ . The ratio of  $k_{cat}/K_m$  is referred to as the catalytic efficiency of the enzyme. A large  $k_{cat}$  (high turnover) or a small  $K_m$  (high substrate affinity) will result in a higher catalytic efficiency, which indicates a more efficient enzyme. The Lineweaver-Burk plot is a double reciprocal graph of the Michaelis-Menten equation. The same data graphed in this way yield a straight line as shown in Figure 2.5. The actual data are represented by the portion of the graph to the right of the y-axis, but the line is extrapolated into the upper left quadrant to determine its intercept with the x-axis. The intercept of the line with the x-axis gives the value of  $-1/K_m$ . The intercept of the line with the y-axis gives the value of  $-1/v_{max}$ . The Lineweaver-Burk plot is especially useful when determining the type of inhibition that an enzyme is experiencing because  $v_{max}$  and  $K_m$  can be compared without estimation.

Figure 2.5 Experimentally Determined Lineweaver-Burk (Double Reciprocal) Plot Used to Calculate the Values of  $K_m$  and  $v_{max}$

The cooperative binding of hemoglobin, which acts as a transport protein rather than an enzyme, results in a characteristic sigmoidal binding curve that is an MCAT favorite. Certain enzymes do not show the normal hyperbola when graphed on a Michaelis-Menten plot ( $v$  vs.  $[S]$ ), but rather show sigmoidal (S-shaped) kinetics owing to cooperativity among substrate binding sites, as shown in Figure 2.6. Cooperative enzymes have multiple subunits and multiple active sites. Subunits and enzymes may exist in one of two states: a low-affinity tense state (T) or a high-affinity

relaxed state (R). Binding of the substrate encourages the transition of other subunits from the T state to the R state, which increases the likelihood of substrate binding by these other subunits. Conversely, loss of substrate can encourage the transition from the R state to the T state, and promote dissociation of substrate from the remaining subunits. Think of cooperative enzyme kinetics like a party. As more people start arriving, the atmosphere becomes more relaxed and the party seems more appealing, but as people start going home the party dies down and more people are encouraged to leave so the tense hosts can clean up. Enzymes showing cooperative kinetics are often regulatory enzymes in pathways, like phosphofructokinase-1 in glycolysis. Cooperative enzymes are also subject to activation and inhibition, both competitively and through

**Figure 2.6 Cooperative Enzyme Kinetics**

Cooperativity can also be quantified using a numerical value called Hill's coefficient. The value of Hill's coefficient indicates the nature of binding by If Hill's coefficient  $> 1$ , positively cooperative binding is occurring, such that after one ligand is bound the affinity of the enzyme for further ligand(s) increases. If Hill's coefficient  $< 1$ , negatively cooperative binding is occurring, such that after one ligand is bound the affinity of the enzyme for further ligand(s) decreases. If Hill's coefficient  $= 1$ , the enzyme does not exhibit cooperative

**BIOCHEMISTRY**

**GUIDED EXAMPLE WITH EXPERT** The PH1704 protease from *Pyrococcus horikoshii* OT3 is a hyperthermophilic enzyme that belongs to the DJ-1/Thij/PfpI superfamily. One of its members, the human protein DJ-1, has recently been reported to cause certain types of early-onset Parkinsonism. Thus, an increasing number of studies on this superfamily are being conducted. Despite this growing interest, few members of this superfamily have been biochemically characterized. PH1704 has both endopeptidase (cleaves nonterminal amino acids) and aminopeptidase (cleaves amino acids from the N-terminus) activity. Further analysis suggests that PH1704 specifically cleaves after arginine. Two 7-amino-4-methylcoumarin (AMC)- linked substrates were used in kinetic assays: R- AMC and AAFR-AMC. Predictive substrate docking studies pinpointed Tyr-120 in the active site, possibly involved in aromatic and hydrophobic interaction with the substrate. Therefore, Tyr-120 was chosen for mutation to analyze the



effects on PH1704 kinetics, and the results are shown in Table 1 below. This is just a lot of context; the useful info is that PH1704 is a protease, which means it is an enzyme that cleaves 2 kinds of protease activity for this AMC sounds like a molecule attached to amino acids or Y120 seems like an higher for Y120P, Y120S is much product in both cases (lower kcat), and, in general, Adapted from Zhan, D., Bai, A., Yu, L., Han, W., & Feng, Y. (2014). Characterization of the PH1704 protease from *Pyrococcus horikoshii* OT3 and the critical functions of Tyr120. PLoS

According to the data, does PH1704 have equivalent aminopeptidase and endopeptidase activity? Why or why

The question asks us for data analysis, so we know we should start by making sure we understand what the given material is telling us. A quick scan of the passage reveals unfamiliar enzymes, terminology, and a data-packed table, so a careful read of the passage for the big picture will be important in order to relate what the table is trying to prove. We are also definitely going to need to bring in some of our outside knowledge about enzymes. The passage describes an enzyme called PH1704, which has several characteristics outlined in the first half of the paragraph. We're told it's a protease, which means it breaks peptide bonds, and it's hyperthermophilic. Breaking down the term hyperthermophilic, we get hyper- (higher) -thermo- (heat) -philic (love), and we can thus deduce that the enzyme is from a bacterial species that lives in high temperatures. Next, we're told it's an endopeptidase (endo-meaning between) and an aminopeptidase with a strong preference for arginine. There are two substrates described in the study. Notice how only R-AMC can be used to discern the aminopeptidase activity, and AAFR-AMC can be used to test endopeptidase activity. Finally, we're told that Tyr-120 can be important for activity, so researchers created mutations of this residue and the kinetic information of the resulting mutants is described in

The question asks us to determine whether PH1704 acts equally as an aminopeptidase and an endopeptidase. In order to answer this question, first note that the mutation data for Y120 is not needed since we are only being asked about the wild-type PH1704 enzyme. All we really need is a comparison between the WT enzyme with R- AMC as a substrate, and WT enzyme with AAFR-AMC as a substrate. Also, we need to determine whether kcat, km, or kcat/km will be

most useful. Recall that  $k_{cat}$  provides information about how much product is produced per unit time, and  $K_m$  is a measure of substrate affinity. To have an enzyme that is maximally efficient, you want both a high catalytic turnover (high  $k_{cat}$ ) and a high substrate affinity (low  $K_m$ ), so the best comparison would be the  $k_{cat}/K_m$  data, which is equal to the catalytic efficiency of an enzyme. The catalytic efficiency for PH1704 as an aminopeptidase is  $0.052 \text{ min}^{-1}/\mu\text{M}$ , and for PH1704 as an endopeptidase efficiency is  $0.018 \text{ min}^{-1}/\mu\text{M}$ . Since these values of catalytic efficiency are different when measuring aminopeptidase and endopeptidase activity, we can conclude that PH1704 functions more effectively as an aminopeptidase than as an endopeptidase.

**MCAT CONCEPT CHECK 2.3** Before you move on, assess your understanding of the material with these questions.

1. What are the effects of increasing  $[S]$  on enzyme kinetics? What about increasing  $[I]$ ?
2. How are the Michaelis–Menten and Lineweaver–Burk plots similar? How are they different?
3. What does  $K_m$  represent? What would an increase in  $K_m$  signify?
4. What do the x- and y-intercepts in a Lineweaver–Burk plot represent?
5. What is enzyme cooperativity?

**2.4 Effects of Local Conditions on Enzyme Activity**

After Chapter 2.4, you will be able to:

- Predict how changes to the environment will alter enzyme behavior
- Estimate the ideal pH and temperature for enzymes found in the human body

The activity of an enzyme is heavily influenced by its environment; in particular, temperature, acidity or alkalinity (pH), and high salinity have significant effects on the ability of an enzyme to carry out its function. Note that the terms enzyme activity, enzyme velocity, and enzyme rate are all used synonymously on the MCAT. Enzyme-catalyzed reactions tend to double in velocity for every  $10^\circ\text{C}$  increase in temperature until the optimum temperature is reached; for the human body, this is  $37^\circ\text{C}$  ( $98.6^\circ\text{F}$  or  $310 \text{ K}$ ). After this, activity falls off sharply, as the enzyme will denature at higher temperatures, as shown in Figure 2.7. Some enzymes that are overheated may regain their function if cooled. A real-life example of temperature dependence occurs in Siamese cats. Siamese cats are dark on their faces, ears, tails, and feet but white elsewhere. Why? The enzyme responsible for pigmentation, tyrosinase, is mutated in Siamese cats. It is ineffective at body temperature but at cooler temperatures becomes

active. Thus, only the tail, feet, ears, and face (cooled by air passing through the nose and mouth) have an active form of the enzyme and are dark. Figure 2.7 Effects of Temperature and pH on the Rate of Enzyme Action The pH levels in the stomach and intestine, and their effects on these gastric and pancreatic enzymes, are covered in Chapter 9 of MCAT Biology Review. Most enzymes also depend on pH in order to function properly, not only because pH affects the ionization of the active site, but also because changes in pH can lead to denaturation of the enzyme. For enzymes that circulate and function in human blood, this optimal pH is 7.4, as shown in Figure 2.7. A pH < 7.35 in human blood is termed acidemia. Even though it's more basic than chemically neutral 7.0, it is more acidic than physiologically neutral 7.4. Where might exceptions to this pH 7.4 occur? Both are in our digestive tract. Pepsin, which works in the stomach, has maximal activity around pH 2, whereas pancreatic enzymes, which work in the small intestine, work best around pH 8.5. While the effect of salinity or osmolarity is not generally of physiologic significance, altering the concentration of salt can change enzyme activity in vitro. Increasing levels of salt can disrupt hydrogen and ionic bonds, causing a partial change in the conformation of the enzyme, and in some cases

MCAT CONCEPT CHECK

2.4 Before you move on, assess your understanding of the material with these questions. 1. What are the effects of temperature, pH, and salinity on the function of enzymes? 2. What is the ideal temperature for most enzymes in the body? The ideal pH? Ideal temperature: \_\_\_\_\_ °C = \_\_\_\_\_ °F = \_\_\_\_\_ K Ideal pH (most enzymes): \_\_\_\_\_ Ideal pH (gastric enzymes): \_\_\_\_\_ Ideal pH (pancreatic enzymes): \_\_\_\_\_

2.5 Regulation of Enzyme Activity After Chapter 2.5, you will be able to: Explain feedback inhibition and irreversible inhibition Differentiate between the four types of reversible inhibition Differentiate between transient and covalent enzyme modifications Recall the traits of zymogens Although enzymes are useful, the body must be able to control when they work; for example, enzymes involved in mitosis should be shut off when cells are no longer dividing (in the G<sub>0</sub> phase). This may be accomplished in a variety of ways, as described below. Enzymes are often subject to regulation by products further down a given metabolic pathway, a process called feedback regulation. Less often, enzymes may be

regulated by intermediates that precede the enzyme in the pathway, also called feed-forward regulation. This is clearly evident in the study of metabolism, as discussed in Chapters 9 through 12 of MCAT Biochemistry Review. While there are some examples of feedback activation, feedback inhibition is far more common. Feedback inhibition, or negative feedback, helps maintain homeostasis: once we have enough of a given product, we want to turn off the pathway that creates that product, rather than creating more. In feedback inhibition, the product may bind to the active site of an enzyme or multiple enzymes that acted earlier in its biosynthetic pathway, thereby competitively inhibiting these enzymes and making them unavailable for use. This is schematically represented in Figure 2.8, as we see product D feeding back to inhibit the first enzyme in the Figure 2.8 Feedback Inhibition by the Product of a Metabolic Pathway. A high concentration of the product, D, inhibits enzyme 1, slowing the entire pathway. Negative feedback is an important topic in both enzymology and the endocrine system. Remember that most hormonal feedback loops are also inhibited by negative feedback. The endocrine system is discussed in Chapter 5 of MCAT Biology Review. The concept of competitive inhibition has relevance in the clinical setting. For example, methanol (wood alcohol), if ingested, is enzymatically converted to toxic metabolites, which can cause blindness and even death. Administration of intravenous ethanol is the treatment of choice for a patient suffering from methanol poisoning. Ethanol works by competing with methanol for the active sites of the enzymes involved. There are four types of reversible inhibition: competitive, noncompetitive, mixed, and uncompetitive. On Test Day, you will most often encounter competitive and noncompetitive inhibition, but be aware of the differences in the four types. Table 2.2 at the end of this section summarizes the features of each type of reversible inhibition. Table 2.2 Comparison of Reversible Inhibitors

Competitive inhibition simply involves occupancy of the active site. Substrates cannot access enzymatic binding sites if there is an inhibitor in the way. Competitive inhibition can be overcome by adding more substrate so that the substrate-to-inhibitor ratio is higher. If more molecules of substrate are available than molecules of inhibitor, then the enzyme will be more likely to bind substrate

than inhibitor (assuming the enzyme has equal affinity for both molecules). Adding a competitive inhibitor does not alter the value of  $v_{max}$  because if enough substrate is added, it will outcompete the inhibitor and be able to run the reaction at maximum velocity. A competitive inhibitor does increase the measured value of  $K_m$ . This is because the substrate concentration has to be higher to reach half the maximum velocity in the presence of the inhibitor. A Lineweaver-Burk plot comparing an enzyme with and without a competitive inhibitor is shown in Figure 2.9.

**Lineweaver-Burk Plot of Competitive Inhibition**

Noncompetitive inhibitors bind to an allosteric site instead of the active site, which induces a change in enzyme conformation. Allosteric sites are non-catalytic regions of the enzyme that bind regulators. Because the two molecules do not compete for the same site, inhibition is considered noncompetitive and cannot be overcome by adding more substrate. Noncompetitive inhibitors bind equally well to the enzyme and the enzyme-substrate complex, unlike mixed inhibitors. Once the enzyme's conformation is altered, no amount of extra substrate will be conducive to forming an enzyme-substrate complex. Adding a noncompetitive inhibitor decreases the measured value of  $v_{max}$  because there is less enzyme available to react; it does not, however, alter the value of  $K_m$  because any copies of the enzyme that are still active maintain the same affinity for their substrate. A Lineweaver-Burk plot of an enzyme with and without a noncompetitive inhibitor is shown in Figure 2.10.

**Figure 2.10 Lineweaver-Burk Plot of Noncompetitive Inhibition**

Mixed inhibition results when an inhibitor can bind to either the enzyme or the enzyme-substrate complex, but has different affinity for each. If the inhibitor had the same affinity for both, it would be a noncompetitive inhibitor. Mixed inhibitors do not bind at the active site, but at an allosteric site. Mixed inhibition alters the experimental value of  $K_m$  depending on the preference of the inhibitor for the enzyme vs. the enzyme-substrate complex. If the inhibitor preferentially binds to the enzyme, it increases the  $K_m$  value (lowers affinity); if the inhibitor binds to the enzyme-substrate complex, it lowers the  $K_m$  value (increases affinity). In either case,  $v_{max}$  is decreased. On a Lineweaver-Burk plot, the curves for the activity with and without the

inhibitor intersect at a point that is not on either axis. Uncompetitive inhibitors bind only to the enzyme–substrate complex and essentially lock the substrate in the enzyme, preventing its release. This can be interpreted as increasing affinity between the enzyme and substrate. Because the enzyme–substrate complex has already formed upon binding, uncompetitive inhibitors must bind at an allosteric site; in fact, it is the formation of the enzyme–substrate complex that creates a conformational change that allows the uncompetitive inhibitor to bind. Thus, uncompetitive inhibitors lower  $K_m$  and  $v_{max}$ . On a Lineweaver–Burk plot, the curves for activity with and without an uncompetitive inhibitor are parallel. In this type of inhibition, the active site is made unavailable for a prolonged period of time, or the enzyme is permanently altered. In other words, this type of inhibition is not easily overcome or reversed. A real-world example is aspirin. Acetylsalicylic acid (aspirin) irreversibly modifies cyclooxygenase-1. The enzyme can no longer bind its substrate (arachidonic acid) to make its products (prostaglandins), which are involved in modulating pain and inflammatory responses. To make more prostaglandins, new cyclooxygenase-1 will have to be synthesized through transcription and translation. Irreversible inhibition is a prime drug mechanism, and something that you will come across often in medical school. Enzymes that are allosteric have multiple binding sites. The active site is present, as well as at least one other site that can regulate the availability of the active site. These are known as allosteric sites. Allosteric enzymes alternate between an active and an inactive form. The inactive form cannot carry out the enzymatic reaction. Molecules that bind to the allosteric site may be either allosteric activators or allosteric inhibitors. Binding of either causes a conformational shift in the protein; however, the effect differs. An activator will result in a shift that makes the active site more available for binding to the substrate, whereas an inhibitor will make it less available. In addition to being able to alter the conformation of the protein, binding of activators or inhibitors may alter the activity of the enzyme. As shown in Figure 2.6 above, Michaelis–Menten plots of cooperative allosteric enzyme kinetics often have a sigmoidal (S-shaped) curve. Covalently Modified Enzymes In addition to transient interactions, enzymes are often subject to covalent

modification. Enzymes can be activated or deactivated by phosphorylation or dephosphorylation. One cannot predict whether phosphorylation or dephosphorylation will activate an enzyme without experimental determination. Glycosylation, the covalent attachment of sugar moieties, is another covalent enzyme modification. Glycosylation can tag an enzyme for transport within the cell, or can modify protein activity and selectivity. Specific mechanisms for the modification of enzymes by glycosylation are still being studied, and are beyond the scope of the MCAT. Consider that digestive enzymes, discussed in Chapter 9 of MCAT Biology Review, chew up fats, proteins, and carbohydrates—the very same compounds of which our body is made. How do these enzymes know to digest your food but not your body? Simply put, they don't! So, we regulate their activity in a coordinated manner using feedback mechanisms and other substances. Certain enzymes are particularly dangerous if they are not tightly controlled. These include the digestive enzymes like trypsin, which, if released from the pancreas in an uncontrolled manner, would digest the organ itself. To avoid this danger, these enzymes and many others are secreted as inactive zymogens like trypsinogen. Zymogens contain a catalytic (active) domain and regulatory domain. The regulatory domain must be either removed or altered to expose the active site. Apoptotic enzymes (caspases) exhibit similar regulation. Most zymogens have the suffix -ogen.

MCAT CONCEPT CHECK 2.5 Before you move on, assess your understanding of the material with these questions. 1. What is feedback inhibition? 2. Of the four types of reversible inhibitors, which could potentially increase  $K_m$ ? 3. What is irreversible inhibition? 4. What are some examples of transient and covalent enzyme modifications? 5. Why are some enzymes released as zymogens? Our current chapter focused on the way in which cells are able to carry out the reactions necessary for life. We began with a discussion of the types of enzymes that you are likely to encounter on Test Day before reviewing thermodynamics and kinetics in relation to enzymes, which are biological catalysts. We went on to discuss the analysis of kinetic data with two different types of graphs, and talked about cooperativity. Because catalysts are generally most active in their native environment, we considered the impact of temperature, pH, and

salinity on their activity. All of these are likely to appear on Test Day. Enzymes need to be regulated; we analyzed the basics of feedback mechanisms. We talked about inhibitors of enzymes, which may be reversible or irreversible. The difference between the types of reversible inhibition is a key Test Day concept. Finally, we discussed changes in enzyme activity that may include allosteric activation, covalent modification, or cleavage of inactive zymogens. Let's move on now to discuss the nonenzymatic functions of proteins. You will notice many parallels between the new material and the concepts described in this chapter, like binding affinity. By the end of the next chapter, you'll be ready to face any protein question the MCAT can throw at you! You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources!

### Enzymes as Biological Catalysts

Enzymes are biological catalysts that are unchanged by the reactions they catalyze and are reusable. Each enzyme catalyzes a single reaction or type of reaction with high

**Oxidoreductases** catalyze oxidation–reduction reactions that involve the transfer of electrons.

**Transferases** move a functional group from one molecule to another

**Hydrolases** catalyze cleavage with the addition of water.

**Lyases** catalyze cleavage without the addition of water and without the transfer of electrons. The reverse reaction (synthesis) is often more

**Isomerases** catalyze the interconversion of isomers, including both constitutional isomers and stereoisomers.

**Ligases** are responsible for joining two large biomolecules, often of the

**Exergonic** reactions release energy;  $\Delta G$  is negative. Enzymes lower the activation energy necessary for biological reactions. Enzymes do not alter the free energy ( $\Delta G$ ) or enthalpy ( $\Delta H$ ) change that accompanies the reaction nor the final equilibrium position; rather, they change the rate (kinetics) at which equilibrium is reached.

### Mechanisms of Enzyme Activity

Enzymes act by stabilizing the transition state, providing a favorable microenvironment, or bonding with the substrate molecules. Enzymes have an active site, which is the site of catalysis. Binding to the active site is explained by the lock and key theory or the induced fit model. The lock and key theory hypothesizes that the enzyme and substrate are exactly complementary. The induced fit model hypothesizes that the enzyme and substrate undergo conformational



changes to interact fully. Some enzymes require metal cation cofactors or small organic coenzymes to be active. Enzymes experience saturation kinetics: as substrate concentration increases, the reaction rate does as well until a maximum value is reached. Michaelis–Menten and Lineweaver–Burk plots represent this relationship as a hyperbola and line, respectively. Enzymes can be compared on the basis of their  $K_m$  and  $v_{max}$  values. Cooperative enzymes display a sigmoidal curve because of the change in activity with substrate binding. Effects of Local Conditions on Enzyme Temperature and pH affect an enzyme's activity *in vivo*; changes in temperature and pH can result in denaturing of the enzyme and loss of activity due to loss of secondary, tertiary, or, if present, quaternary structure. *In vitro*, salinity can impact the action of enzymes. Regulation of Enzyme Activity Enzyme pathways are highly regulated and subject to inhibition and Feedback inhibition is a regulatory mechanism whereby the catalytic activity of an enzyme is inhibited by the presence of high levels of a product later in the same pathway. Reversible inhibition is characterized by the ability to replace the inhibitor with a compound of greater affinity or to remove it using mild laboratory treatment. Competitive inhibition results when the inhibitor is similar to the substrate and binds at the active site. Competitive inhibition can be overcome by adding more substrate.  $v_{max}$  is unchanged,  $K_m$  is increased. Noncompetitive inhibition results when the inhibitor binds with equal affinity to the enzyme and the enzyme–substrate complex.  $v_{max}$  is decreased,  $K_m$  is unchanged. Mixed inhibition results when the inhibitor binds with unequal affinity to the enzyme and the enzyme–substrate complex.  $v_{max}$  is decreased,  $K_m$  is increased or decreased depending on if the inhibitor has higher affinity for the enzyme or enzyme–substrate. Uncompetitive inhibition results when the inhibitor binds only with the enzyme–substrate complex.  $K_m$  and  $v_{max}$  both decrease. Irreversible inhibition alters the enzyme in such a way that the active site is unavailable for a prolonged duration or permanently; new enzyme molecules must be synthesized for the reaction to occur. Regulatory enzymes can experience activation as well as inhibition. Allosteric sites can be occupied by activators, which increase either affinity or enzymatic turnover. Phosphorylation (covalent modification with phosphate) or glycosylation

(covalent modification with carbohydrate) can alter the activity or selectivity of enzymes. Zymogens are secreted in an inactive form and are activated by

Answers to Concept Checks 1. Catalysts are characterized by two main properties: they reduce the activation energy of a reaction, thus speeding up the reaction, and they are not used up in the course of the reaction. Enzymes improve the environment in which a particular reaction takes place, which lowers its activation energy. They are also regenerated at the end of the reaction to their original form.

2. Enzyme specificity refers to the idea that a given enzyme will only catalyze a given reaction or type of reaction. For example, serine/threonine-specific protein kinases will only place a phosphate group onto the hydroxyl group of a serine or threonine residue.

Addition or synthesis reactions, generally between large molecules, often  
Rearrangement of bonds within a compound  
Cleavage of a single molecule into two products, or synthesis of small  
Breaking of a compound into two molecules using the addition of water  
Oxidation–reduction reactions (transferring electrons)  
Movement of a functional group from one molecule to another

4. Enzymes have no effect on the overall thermodynamics of the reaction; they have no effect on the  $\Delta G$  or  $\Delta H$  of the reaction, although they do lower the energy of the transition state, thus lowering the activation energy. However, enzymes have a profound effect on the kinetics of a reaction. By lowering activation energy, equilibrium can be achieved faster (although the equilibrium position does not change).

Lock and Key  
Active site of enzyme fits exactly  
No alterations to tertiary or quaternary structure of enzyme  
Less accurate model  
Active site of enzyme molds itself around substrate only when substrate is present  
Tertiary and quaternary structure is modified for enzyme to function  
More accurate model

2. Cofactors and coenzymes both act as activators of enzymes. Cofactors tend to be inorganic (minerals), while coenzymes tend to be small organic compounds (vitamins). In both cases, these regulators induce a conformational change in the enzyme that promotes its activity. Tightly bound cofactors or coenzymes that are necessary for enzyme function are termed prosthetic groups.

1. Increasing  $[S]$  has different effects, depending on how much substrate is present to begin with. When the substrate concentration is low, an increase in  $[S]$

causes a proportional increase in enzyme activity. At high  $[S]$ , however, when the enzyme is saturated, increasing  $[S]$  has no effect on activity because  $v_{max}$  has already been attained. Increasing  $[E]$  will always increase  $v_{max}$ , regardless of the starting concentration of enzyme.

2. Both the Michaelis–Menten and Lineweaver–Burk relationships account for the values of  $K_m$  and  $v_{max}$  under various conditions. They both provide simple graphical interpretations of these two variables and are derived from the Michaelis–Menten equation. However, the axes of these graphs and visual representation of this information is different between the two. The Michaelis–Menten plot is  $v$  vs.  $[S]$ , which creates a hyperbolic curve for monomeric enzymes. The Lineweaver–Burk plot, on the other hand, is  $1/v$  vs.  $1/[S]$ , which creates a straight line.

3.  $K_m$  is a measure of an enzyme's affinity for its substrate, and is defined as the substrate concentration at which an enzyme is functioning at half of its maximal velocity. As  $K_m$  increases, an enzyme's affinity for its substrate decreases.

4. The x-intercept represents  $-1/K_m$  and the y-intercept represents  $1/v_{max}$ .

5. Cooperativity refers to the interactions between subunits in a multisubunit enzyme or protein. The binding of substrate to one subunit induces a change in the other subunits from the T (tense) state to the R (relaxed) state, which encourages binding of substrate to the other subunits. In the reverse direction, the unbinding of substrate from one subunit induces a change from R to T in the remaining subunits, promoting unbinding of substrate from the remaining subunits.

1. As temperature increases, enzyme activity generally increases (doubling approximately every  $10^\circ\text{C}$ ). Above body temperature, however, enzyme activity quickly drops off as the enzyme denatures. Enzymes are maximally active within a small pH range; outside of this range, activity drops quickly with changes in pH as the ionization of the active site changes and the protein is denatured. Changes in salinity can disrupt bonds within an enzyme, causing disruption of tertiary and quaternary structure, which leads to loss of enzyme function.

2. Ideal temperature:  $37^\circ\text{C} = 98.6^\circ\text{F} = 310\text{ K}$  Ideal pH for most enzymes is 7.4; for gastric enzymes, around 2; for pancreatic enzymes, around 8.5.

1. Feedback inhibition refers to the product of an enzymatic pathway turning off enzymes further back in that same pathway. This helps maintain homeostasis: as product levels rise,

the pathway creating that product is appropriately downregulated. 2. A competitive inhibitor increases  $K_m$  because the substrate concentration has to be higher to reach half the maximum velocity in the presence of the inhibitor. A mixed inhibitor will increase  $K_m$  only if the inhibitor preferentially binds to the enzyme over the enzyme-substrate complex. 3. Irreversible inhibition refers to the prolonged or permanent inactivation of an enzyme, such that it cannot be easily renatured. 4. Examples of transient modifications include allosteric activation or inhibition. Examples of covalent modifications include phosphorylation. 5. Zymogens are precursors of active enzymes. It is critical that certain enzymes (like the digestive enzymes of the pancreas) remain inactive until arriving at their target site.

Science Mastery Assessment

Enzymes catalyze reactions by lowering their activation energy, and are not changed or consumed during the course of the reaction. While the activation energy is lowered, the free energy of the reaction,  $\Delta G$ , remains unchanged in the presence of an enzyme. A reaction will continue to occur in the presence or absence of an enzyme; it simply runs slower without the enzyme, eliminating (A). Most physiological reactions are optimized at body temperature,  $37^\circ\text{C}$ , eliminating (B). Finally, dehydrogenases catalyze oxidation-reduction reactions, not transfer reactions, eliminating (C). Most enzymes in the human body operate at maximal activity around a temperature of  $37^\circ\text{C}$  and a pH of 7.4, which is the pH of most body fluids. In addition, as characterized by the Michaelis-Menten equation, enzymes form an enzyme-substrate complex, which can either dissociate back into the enzyme and substrate or proceed to form a product. So far, we can eliminate (B), (C), and (D), so let's check (A). An increase in the substrate concentration, while maintaining a constant enzyme concentration, leads to a proportional increase in the rate of the reaction only initially. However, once most of the active sites are occupied, the reaction rate levels off, regardless of further increases in substrate concentration. At high concentrations of substrate, the reaction rate approaches its maximal velocity and is no longer changed by further increases in substrate. An enzyme devoid of its necessary cofactor is called an apoenzyme and is. An enzyme's specificity is determined by the three-dimensional shape of its active site. Regardless of which explanation for enzyme

specificity we are discussing (lock and key or induced fit), the active site determines which substrate the enzyme will react with. As the temperature of the DNA polymerase sample increases from 0°C to the usual physiological temperature, i.e. 37°C, the enzyme's activity will increase. However, at temperatures above 37°C, the enzyme's activity will rapidly decline due to denaturation. By limiting the activity of enzyme 1, the rest of the pathway is slowed, which is the definition of negative feedback. (A) is incorrect because there is no competition for the active site with allosteric interactions. While many products do indeed competitively inhibit an enzyme in the pathway that creates them, this is an example of an allosterically inhibited enzyme. There is not enough information for (B) to be correct because we aren't told whether the inhibition is reversible. In general, allosteric interactions are temporary. (C) is incorrect because it is the opposite of what occurs when enzyme 1 activity is reduced. While the equations given in the text are useful, recognizing relationships is even more important. You can see that as substrate concentration increases significantly, there is only a small change in the rate. This occurs as we approach  $v_{max}$ . Because the  $v_{max}$  is near 100 mmol equals 50 mmol The substrate concentration giving this rate is 0.5 mM and corresponds to  $K_m$ ; therefore, (A) is correct. As with the last question, relationships are important. At a concentration of  $5 \times 10^6$  M, enzyme A is working at one-half of its  $v_{max}$  because the concentration is equal to the  $K_m$  of the enzyme. Therefore, one-half of 20 is 10 mmol , which corresponds to (A). At a concentration of  $5 \times 10^4$  M, there is 100 times more substrate than present at half maximal velocity. At high values (significantly larger than the value of  $K_m$ ), the enzyme is at or near its  $v_{max}$ , which is 20 mmol Based on the graph, when the substrate is present, oseltamivir results in the same  $v_{max}$  and a higher  $K_m$  compared to when no inhibitor is added. These are hallmarks of competitive inhibitors. Noncompetitive inhibitors result in decreased  $v_{max}$  and the same  $K_m$  as the uninhibited reaction, which is shown by the zanamivir line in the graph. Because the question is only comparing the values between the two inhibitors, and not the enzyme without inhibitor, the mechanism of inhibition is less important to determine than the values of  $K_m$  and  $v_{max}$ . This is a great example of why

previewing the answer choices works well in the sciences. Lyases are responsible for the breakdown of a single molecule into two molecules without the addition of water or the transfer of electrons. Lyases often form cyclic compounds or double bonds in the products to accommodate this. Water was not a reactant, and no cofactor was mentioned; thus lyase, (C), remains the best answer choice. Enzymes are not altered by the process of catalysis. A molecule that breaks intramolecular bonds to provide activation energy would not be able to be Cooperative enzymes demonstrate a change in affinity for the substrate depending on how many substrate molecules are bound and whether the last change was accomplished because a substrate molecule was bound or left the active site of the enzyme. Because we cannot determine whether the most recent reaction was binding or dissociation, (A) and (B) are eliminated. We can make absolute comparisons though. For enzymes expressing positive cooperativity, the unbound enzyme has the lowest affinity for substrate, and the enzyme with all but one subunit bound has the highest. The increase in affinity is not necessarily linear. Furthermore, if all four sites have substrate bound, the enzyme cannot bind to any more substrate. Therefore, (C) is not true. An enzyme with two subunits occupied must have a higher affinity for the substrate than the same enzyme with only one subunit occupied; thus, (D) is correct. Triglycerides are unlikely to act as coenzymes for a few reasons, including their large size, neutral charge, and ubiquity in cells. Cofactors and coenzymes tend to be small in size, such as metal ions like (C) or small organic molecules. They can usually carry a charge by ionization, protonation, or deprotonation. Finally, they are usually in low, tightly regulated concentrations within cells. Metabolic pathways would be expected to include both oxidation-reduction reactions and movement of functional groups, thus eliminating (B) and (D). The rate of reaction increases with temperature because of the increased kinetic energy of the reactants, but reaches a peak temperature because the enzyme denatures with the disruption of hydrogen bonds at excessively high temperatures. In the absence of enzyme, this peak temperature is generally much hotter. Heating a reaction provides molecules with an increased chance of achieving the activation energy, but the enzyme catalyst would

typically reduce activation energy. Keep in mind that thermodynamics and kinetics are not interchangeable, so we are not considering the impact of heat on the equilibrium position. Consult your online resources for additional practice. Equations to Remember (2.1) Michaelis–Menten rates:  $E + S \rightleftharpoons E + P$  (2.2) Michaelis–Menten equation:  $K_m + [S]$  (2.3) Turnover number (k<sub>cat</sub>):  $v_{max} = [E]k_{cat}$  Biochemistry Chapter 1 Amino Acids, Peptides, and Proteins Biochemistry Chapter 12 Bioenergetics and Regulation of Metabolism Biology Chapter 5 The Endocrine System Biology Chapter 9 The Digestive System General Chemistry Chapter 5 General Chemistry Chapter 7 General Chemistry Chapter 11 Nonenzymatic Protein Function and Protein Analysis Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate. How to Use This Assessment If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one. If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect. If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your

thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

- At what pH can protein A best be obtained through electrophoresis? (Note: MM = molar mass)
- What is the function of sodium dodecyl sulfate (SDS) in SDS-PAGE?
  - SDS stabilizes the gel matrix, improving resolution during electrophoresis
  - SDS solubilizes proteins to give them uniformly negative charges, so the separation is based purely on size
  - SDS raises the pH of the gel, separating multiunit proteins into subunits
  - SDS solubilizes proteins to give them uniformly positive charges, so separation is based purely on pH
- Which of the following is NOT involved in cell migration?
  - Chemokines
  - Integrins
  - Adhesion molecules
  - Gap junctions
- Which of the following proteins is most likely to be found in the body?
  - Insulin
  - Antibodies
  - Enzymes
  - Hormones
- Hormones are found in the body in very low concentrations, but tend to have a strong effect. What type of receptor are hormones most likely to act on?
  - Ligand-gated ion channels
  - Enzyme-linked receptors
  - G protein-coupled receptors
  - Ion channels
- Which of the following is most likely to be found bound to a protein in the body?
  - Antibodies
  - Enzymes
  - Hormones
  - Integrins
- Which of the following characteristics is NOT attributed to antibodies?
  - Antibodies bind to more than one distinct antigen
  - Antibodies label antigens for targeting by other immune cells
  - Antibodies can cause agglutination by interaction with antigen
  - Antibodies have two heavy chains and two light chains
- Which ion channels are responsible for maintaining the resting membrane potential?
  - Ungated channels
  - Voltage-gated channels
  - Ligand-gated channels
  - No ion channels are involved in maintenance of the resting potential
- Which of the following is NOT a component of all trimeric G proteins?
  - $\alpha$  subunit
  - $\beta$  subunit
  - $\gamma$  subunit
  - GDP
- Which of the following methods would be best to separate large quantities of the following proteins? (Note: MM = molar mass)
  - Ion-exchange chromatography
  - Size-exclusion chromatography
  - Isoelectric focusing
  - Native PAGE
- Which amino acids contribute most significantly to the pI of a protein?
  - I only
  - I and II only
  - I and III only
  - II and III only
- How does the gel for isoelectric focusing differ from the gel for SDS-PAGE?
  - Isoelectric focusing uses a gel with much larger pore sizes to allow for complete migration
  - Isoelectric focusing uses a gel with SDS added to encourage a uniform negative charge
  - Isoelectric focusing uses a gel with a pH gradient that encourages a variable charge
  - The gel is unchanged in isoelectric focusing; the protein mixture is treated before loading
- Which protein properties allow UV detection of proteins in SDS-PAGE?
  - Proteins absorb UV light
  - Proteins fluoresce under UV light
  - Proteins are stained with a dye that fluoresces under UV light
  - Proteins are stained with a dye that absorbs UV light



spectroscopy to be used as a method of determining concentration? A. Proteins have partially planar characteristics in peptide bonds. B. Globular proteins cause scattering of light. C. Proteins contain aromatic groups in certain amino acids. D. All organic macromolecules can be assessed with UV 14.

A protein collected through affinity chromatography displays no activity even though it is found to have a high concentration using the Bradford protein assay. What best explains these findings? A. The Bradford reagent was prepared incorrectly. B. The active site is occupied by free ligand. C. The protein is bound to the column. D. The protein does not catalyze the reaction of interest.

15. What property of protein-digesting enzymes allows for a sequence to be determined without fully degrading the protein? Nonenzymatic Protein Function and Protein Analysis

In This Chapter

3.1 Cellular Functions Cell Adhesion Molecules G Protein-Coupled Receptors

3.3 Protein Isolation

3.4 Protein Analysis Amino Acid Composition

The content in this chapter should be relevant to about 4% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories:

analysis. 1A: Structure and function of proteins and their constituent amino acids 3A: Structure and functions of the nervous and endocrine systems, and ways in which these systems coordinate the organ systems 5C: Separation and purification methods 5D: Structure, function, and reactivity of biologically relevant molecules

Did you ever wonder why some athletes eat raw eggs when training? It doesn't help with digestion or increase enzymatic activity throughout the body; rather, all that protein is used for muscle building. While muscle building does increase cytoplasm and all of the enzymes found therein, the biggest increase is seen in structural and motor proteins like actin and myosin. Valid concerns about bacteria in and on eggs have stopped most athletes from drinking raw eggs, but protein shakes and massive containers of whey protein have replaced them on the shelves of health-food stores, pharmacies, and supermarkets

In this chapter, we will examine some of the structural and motor proteins that athletes love to build, as well as more complex protein functions in humans, including biosignaling. Finally, we'll learn how to determine which proteins—and their concentrations—are in those eggs through separation and quantitative analysis.

3.1

Cellular Functions After Chapter 3.1, you will be able to: Compare and contrast cytoskeletal proteins and motor proteins Associate collagen, elastin, keratins, actin, and tubulin with their major functions Describe the adhesive properties of cadherins, integrins, and selectins Predict the possible outcomes of an antibody binding to its antigen Typical functions provided by proteins within the cell include supporting cellular shape and organization and acting as enzymes. The enzymatic functions of proteins were detailed in Chapter 2 of MCAT Biochemistry Review and we are now ready to look at other protein functions. Structural and motor proteins are found in abundance within individual cells and are also found in the extracellular matrix. The cytoskeleton can be thought of as a three-dimensional web or scaffolding system for the cell. It is comprised of proteins that are anchored to the cell membrane by embedded protein complexes. In addition to intracellular support, extracellular matrices composed of proteins also support the tissues of the body. Tendons, ligaments, cartilage, and basement membranes are all proteinaceous. The primary structural proteins in the body are collagen, elastin, keratin, actin, and tubulin. Structural proteins generally have highly repetitive secondary structure and a super-secondary structure—a repetitive organization of secondary structural elements together sometimes referred to as a motif. This regularity gives many structural proteins a fibrous nature. Collagen has a characteristic trihelical fiber (three left-handed helices woven together to form a secondary right-handed helix) and makes up most of the extracellular matrix of connective tissue. It is found throughout the body and is important in providing strength and flexibility. The importance of the structure of collagen is highlighted in the disorder osteogenesis imperfecta, also referred to as brittle bone disease. Collagen—a major component of bone —forms a unique and specific secondary helical structure based on the abundance of the amino acid glycine. The replacement of glycine with other amino acids can cause improper folding of the collagen protein and cell death, leading to bone fragility. Elastin is another important component of the extracellular matrix of connective tissue. Its primary role is to stretch and then recoil like a spring, which restores the original shape of the tissue. Keratins are intermediate filament

proteins found in epithelial cells. Keratins contribute to the mechanical integrity of the cell and also function as regulatory proteins. Keratin is the primary protein that makes up hair and Actin is a protein that makes up microfilaments and the thin filaments in myofibrils. It is the most abundant protein in eukaryotic cells. Actin proteins have a positive side and a negative side; this polarity allows motor proteins to travel unidirectionally along an actin filament, like a one-way street. Tubulin is the protein that makes up microtubules. Microtubules are important for providing structure, chromosome separation in mitosis and meiosis, and intracellular transport with kinesin and dynein, described in the next section. Like actin, tubulin has polarity: the negative end of a microtubule is usually located adjacent to the nucleus, whereas the positive end is usually in the periphery of a cell. Some structural proteins also have motor functions in the presence of motor proteins. The motile cilia and flagella of bacteria and sperm are prime examples, as is the contraction of the sarcomere in muscle. Motor proteins also display enzymatic activity, acting as ATPases that power the conformational change necessary for motor function. Motor proteins have transient interactions with either actin or microtubules. Myosin is the primary motor protein that interacts with actin. In addition to its role as the thick filament in a myofibril, myosin can be involved in cellular transport. Each myosin subunit has a single head and neck; movement at the neck is responsible for the power stroke of sarcomere. Motor proteins are responsible for muscle contraction and cellular movement. Take a moment to review sarcomere structure in Chapter 11 of MCAT Biology Review as another example of the interaction between motor proteins and the cytoskeleton. Kinesins and dyneins are the motor proteins associated with microtubules. They have two heads, at least one of which remains attached to tubulin at all times. Kinesins play key roles in aligning chromosomes during metaphase and depolymerizing microtubules during anaphase of mitosis. Dyneins are involved in the sliding movement of cilia and flagella. Both proteins are important for vesicle transport in the cell, but have opposite polarities: kinesins bring vesicles toward the positive end of the microtubule, and dyneins bring vesicles toward the negative end. In neurons, we see a classic example of these

motor proteins' polarities. Kinesins bring vesicles of neurotransmitter to the positive end of the axonal microtubules (toward the synaptic terminal). In contrast, dyneins bring vesicles of waste or recycled neurotransmitter back toward the negative end of the microtubule (toward the soma) through retrograde transport. The activity of kinesins is illustrated in Figure 3.1 below.

**Figure 3.1 Stepwise Activity of Kinesins** Kinesins move along microtubules in a stepping motion such that one or both heads remain attached at all times. While proteins primarily exert enzymatic or structural functions within the cell, they also can have stabilizing functions in individual cells and the body. Proteins that act in this way transport or sequester molecules by binding to them. Binding proteins include hemoglobin, calcium-binding proteins, DNA-binding proteins (often transcription factors), and others. Each binding protein has an affinity curve for its molecule of interest; the oxyhemoglobin dissociation curve is one well-known example. This curve differs depending on the goal of the binding protein. When sequestration of a molecule is the goal, the binding protein usually has high affinity for its target across a large range of concentrations so it can keep it bound at nearly 100 percent. A transport protein, which must be able to bind or unbind its target to maintain steady-state concentrations, is likely to have varying affinity depending on the environmental conditions.

**Cell Adhesion Molecules** Cell adhesion molecules (CAMs) are proteins found on the surface of most cells and aid in binding the cell to the extracellular matrix or other cells. While there are a number of different types of CAMs, they are all integral membrane proteins. Adhesion molecules can be classified into three major families: cadherins, integrins, and selectins. Cadherins are a group of glycoproteins that mediate calcium-dependent cell adhesion. Cadherins often hold similar cell types together, such as epithelial cells. Different cells usually have type-specific cadherins; for example, epithelial cells use E-cadherin while nerve cells use N-cadherin. Integrins are a group of proteins that all have two membrane-spanning chains called  $\alpha$  and  $\beta$ . These chains are very important in binding to and communicating with the extracellular matrix. Integrins also play a very important role in cellular signaling and can greatly impact cellular function by promoting cell division, apoptosis, or other processes. For

example, integrin  $\alpha\text{IIb}\beta 3$  allows platelets to stick to fibrinogen, a clotting factor, which causes activation of platelets to stabilize the clot. Other integrins are used for white blood cell migration, stabilization of epithelium on its basement membrane, and other processes. Selectins are unique because they bind to carbohydrate molecules that project from other cell surfaces. These bonds are the weakest formed by the CAMs discussed here. Selectins are expressed on white blood cells and the endothelial cells that line blood vessels. Like integrins, they play an important role in host defense, including inflammation and white blood cell migration, as shown in Figure 3.2.

**Figure 3.2 White Blood Cell Migration Using Selectins and Integrins**

Many other proteins are involved in white blood cell migration, but are outside the scope of

Many medications target selectins and integrins. For example, research has shown that the ability of cancer cells to metastasize (break away from a tumor and invade other distant tissues) is associated with unique expression patterns of CAMs. By targeting these CAMs, metastasis may be avoided. To stop the clotting process during heart attacks, other medications target CAMs used by platelets. The immune system is very complex and is made up of many different types of cells and proteins. These cells and proteins have a common purpose: to rid the body of foreign invaders. The most prominent type of protein found in the immune system is the antibody. Antibodies, also called immunoglobulins (Ig) are proteins produced by B-cells that function to neutralize targets in the body, such as toxins and bacteria, and then recruit other cells to help eliminate the threat. Antibodies are Y-shaped proteins that are made up of two identical heavy chains and two identical light chains, as shown in Figure 3.3. Disulfide linkages and noncovalent interactions hold the heavy and light chains together. Each antibody has an antigen-binding region at the tips of the "Y." Within this region, there are specific polypeptide sequences that will bind one, and only one, specific antigenic sequence. The remaining part of the antibody molecule is known as the constant region, which is involved in recruitment and binding of other cells of the immune system, such as macrophages. Thus, when antibodies bind to their targets, called antigens, they can cause one of three

**Figure 3.3 Structure of an Antibody Molecule**

Neutralizing the antigen, making the

pathogen or toxin unable to exert its effect on the body Marking the pathogen for destruction by other white blood cells immediately; this marking function is also called opsonization Clumping together (agglutinating) the antigen and antibody into large insoluble protein complexes that can be phagocytized and digested by macrophages MCAT CONCEPT CHECK

3.1 Before you move on, assess your understanding of the material with these questions. 1. How do cytoskeletal proteins differ from motor proteins? 2. True or False: Motor proteins are not enzymes. 3. What could permit a binding protein involved in sequestration to have a low affinity for its substrate and still have a high percentage of substrate bound? 4. What are the three main classes of cell adhesion molecules? What type of adhesion does each class form? Cell Adhesion Molecule Type of Adhesion 5. When an antibody binds to its antigen, what are the three possible outcomes of this After Chapter 3.2, you will be able to: Contrast enzyme-linked receptors with G protein-coupled receptors Distinguish between ungated channels, voltage-gated channels, and ligand-gated Recognize key features of transport kinetics and biosignaling processes Biosignaling is a process in which cells receive and act on signals. Proteins participate in biosignaling in different capacities, including acting as extracellular ligands, transporters for facilitated diffusion, receptor proteins, and second messengers. The proteins involved in biosignaling can have functions in substrate binding or enzymatic activity. Ion channels are proteins that create specific pathways for charged molecules. They are classified into three main groups that have different mechanisms of opening, but that all permit facilitated diffusion of charged particles. Facilitated diffusion, a type of passive transport, is the diffusion of molecules down a concentration gradient through a pore in the membrane created by this transmembrane protein. It is used for molecules that are impermeable to the membrane (large, polar, or charged). Facilitated diffusion allows integral membrane proteins to serve as channels for these substrates to avoid the hydrophobic fatty acid tails of the phospholipid bilayer. The three main types of ion channels are ungated, voltage-gated, and Hundreds of ion channels have been identified that function in cell signaling and cell excitability. In addition, ion channels are drug targets in the treatment

of everything from heart disease (calcium channel blockers) to seizures (sodium channel blockers) to irritable bowel syndrome (acetylcholine receptor/cation channel blockers). As their name suggests, ungated channels have no gates and are therefore unregulated. For example, all cells possess ungated potassium channels. This means there will be a net efflux of potassium ions through these channels unless potassium is at equilibrium. In voltage-gated channels, the gate is regulated by the membrane potential change near the channel. For example, many excitable cells such as neurons possess voltage-gated sodium channels. The channels are closed under resting conditions, but membrane depolarization causes a protein conformation change that allows them to quickly open and then quickly close as the voltage increases. Voltage-gated nonspecific sodium-potassium channels are found in cells of the sinoatrial node of the heart. Here, they serve as the pacemaker current; as the voltage drops, these channels open to bring the cell back to threshold and fire another action potential, as shown in Figure 3.4.

**Figure 3.4 Action Potential of the Sinoatrial Node**

The activity at the neuromuscular junction and most chemical synapses relies on ligand-gated ion channels. The nervous system especially makes use of this type of gating, as well as voltage-gated ion channels, as discussed in Chapter 4 of MCAT Biology Review. For ligand-gated channels, the binding of a specific substance or ligand to the channel causes it to open or close. For example, neurotransmitters act at ligand-gated channels at the postsynaptic membrane: the inhibitory neurotransmitter  $\gamma$ -aminobutyric acid (GABA) binds to a chloride channel and opens it. The  $K_m$  and  $v_{max}$  parameters that apply to enzymes are also applicable to transporters such as ion channels in membranes. The kinetics of transport can be derived from the Michaelis-Menten and Lineweaver-Burk equations, where  $K_m$  refers to the solute concentration at which the transporter is functioning at half of its maximum activity. Biosignaling can take advantage of either existing gradients (ion channels) or second messenger cascades (enzyme-linked receptors and G protein-coupled receptors). Membrane receptors may also display catalytic activity in response to ligand binding. These enzyme-linked receptors have three primary protein domains: a membrane-spanning domain,

a ligand-binding domain, and a catalytic domain. The membrane-spanning domain anchors the receptor in the cell membrane. The ligand-binding domain is stimulated by the appropriate ligand and induces a conformational change that activates the catalytic domain. This often results in the initiation of a second messenger cascade. Receptor tyrosine kinases (RTK) are classic examples. RTKs are composed of a monomer that dimerizes upon ligand binding. The dimer is the active form that phosphorylates additional cellular enzymes, including the receptor itself (autophosphorylation). Other classes of enzyme-linked receptors include serine/threonine-specific protein kinases and receptor Functions of heterotrimeric G proteins: "Mind your p's and q's": Gq activates phospholipase C. G Protein-Coupled Receptors G protein-coupled receptors (GPCR) are a large family of integral membrane proteins involved in signal transduction. They are characterized by their seven membrane-spanning  $\alpha$ -helices. The receptors differ in specificity of the ligand-binding area found on the extracellular surface of the cell. In order for GPCRs to transmit signals to an effector in the cell, they utilize a heterotrimeric G protein. G proteins are named for their intracellular link to guanine nucleotides (GDP and GTP). The binding of a ligand increases the affinity of the receptor for the G protein. The binding of the G protein represents a switch to the active state and affects the intracellular signaling pathway. There are several different G proteins that can result in either stimulation or inhibition of the signaling pathway. There are three main types of G proteins: Gs stimulates adenylate cyclase, which increases levels of cAMP in the Gi inhibits adenylate cyclase, which decreases levels of cAMP in the Gq activates phospholipase C, which cleaves a phospholipid from the membrane to form PIP2. PIP2 is then cleaved into DAG and IP3; IP3 can open calcium channels in the endoplasmic reticulum, increasing calcium levels in the cell. The three subunits that comprise the G protein are  $\alpha$ ,  $\beta$ , and  $\gamma$ . In its inactive form, the  $\alpha$  subunit binds GDP and is in a complex with the  $\beta$  and  $\gamma$  subunits. When a ligand binds to the GPCR, the receptor becomes activated and, in turn, engages the corresponding G protein, as shown in Step 1 of Figure 3.5. Once GDP is replaced with GTP, the  $\alpha$  subunit is able to dissociate from the  $\beta$  and  $\gamma$  subunits (Step 2). The activated  $\alpha$  subunit alters the activity of



adenylate cyclase. If the  $\alpha$  subunit is  $\alpha_s$ , then the enzyme is activated; if the  $\alpha$  subunit is  $\alpha_i$ , then the enzyme is inhibited. Once GTP on the activated  $\alpha$  subunit is dephosphorylated to GDP (Step 3), the  $\alpha$  subunit will rebind to the  $\beta$  and  $\gamma$  subunits (Step 4), rendering the G protein inactive.

Figure 3.5 Trimeric G Protein Cycle ( $G_s$  or  $G_i$ )

MCAT CONCEPT CHECK 3.2 Before you move on, assess your understanding of the material with these questions.

1. Contrast enzyme-linked receptors with G protein-coupled receptors:

1. What type of ion channel is active at all times?

2. How do transport kinetics differ from enzyme kinetics?

3.3 Protein Isolation After Chapter 3.3, you will be able to:

Recall the major categories of electrophoresis and chromatography

Select the appropriate protein isolation method in a given situation

Identify the mobile and stationary phases when given a separatory apparatus:

In order to better understand a specific protein, it is important to be able to isolate the protein for study. The purification of proteins can be considered an art form when one considers the difficulty of isolating just one protein from a cell containing hundreds to thousands of proteins. Luckily, as Chapter 1 of MCAT Biochemistry Review highlighted, there is a great amount of variation in the physical and chemical properties of proteins and these differences can be exploited in order to purify the protein of interest. Proteins and other biomolecules are isolated from body tissues or cell cultures by cell lysis and homogenization—crushing, grinding, or blending the tissue of interest into an evenly mixed solution. Centrifugation can then isolate proteins from much smaller molecules before other isolation techniques must be employed. The most common isolation techniques are electrophoresis and chromatography, either of which can be used for native or denatured proteins. One method of separating proteins is with electrophoresis. In molecular biology, this is one of the most important analytical techniques. Electrophoresis works by subjecting compounds to an electric field, which moves them according to their net charge and size. Negatively charged compounds will migrate toward the positively charged anode, and positively charged compounds will migrate toward the negatively charged cathode. The velocity of this migration, known as the migration velocity of a molecule,  $v$ , is directly proportional to the electric field strength,  $E$ , and to the net charge on

the molecule,  $z$ , and is inversely proportional to a frictional coefficient,  $f$ , which depends on the mass and shape of the  $v = Ez$ . Polyacrylamide gel is the standard medium for protein electrophoresis. The gel is a slightly porous matrix mixture, which solidifies at room temperature. Proteins travel through this matrix in relation to their size and charge. The gel acts like a sieve, allowing smaller particles to pass through easily while retaining large particles. Therefore, a molecule will move faster through the medium if it is small, highly charged, or placed in a large electric field. Conversely, molecules will migrate slower (or not at all) when they are bigger and more convoluted, electrically neutral, or placed in a small electric field. The size of a standard polyacrylamide gel allows multiple samples to be run simultaneously, as shown in Figure 3.6.

**Figure 3.6 Electrophoresis** As an electrolytic (nonspontaneous) cell, electrophoresis moves charged particles toward their respective oppositely charged electrodes; the larger the particle, the more slowly it migrates. Electrophoresis uses an electrolytic cell ( $\Delta G > 0$ ,  $E_{\text{cell}} < 0$ ), as described in Chapter 12 of MCAT General Chemistry Review. Remember that anions always move toward the anode and cations always move toward the cathode. Polyacrylamide gel electrophoresis (PAGE) is a method for analyzing proteins in their native states. Unfortunately, PAGE is limited by the varying mass-to-charge and mass-to-size ratios of cellular proteins because multiple different proteins may experience the same level of migration. In PAGE, the functional native protein can be recovered from the gel after electrophoresis, but only if the gel has not been stained because most stains denature proteins. PAGE is most useful to compare the molecular size or the charge of proteins known to be similar in size from other analytic methods like SDS-PAGE (described below) or size-exclusion chromatography. For analytic purposes, protein atomic mass is typically expressed in daltons (Da). A dalton is an alternative term for molar mass ( $\text{g mol}^{-1}$ ). The average molar mass of one amino acid is  $\sim 100$  daltons, or  $100 \text{ g mol}^{-1}$ . Sodium dodecyl sulfate (SDS)-polyacrylamide gel electrophoresis is a useful tool because it separates proteins on the basis of relative molecular mass alone. The SDS-PAGE technique starts with the premise of PAGE but adds SDS, a detergent that disrupts all noncovalent interactions. It binds

to proteins and creates large chains with net negative charges, thereby neutralizing the protein's original charge and denaturing the protein. As the proteins move through the gel, the only variables affecting their velocity are  $E$ , the electric field strength, and  $f$ , the frictional coefficient, which depends on mass. After separation, the gel can be stained so the protein bands can be visualized and the results recorded. In isoelectric focusing, a protein stops moving when  $\text{pH} = \text{pI}$ . Proteins can be separated on the basis of their isoelectric point ( $\text{pI}$ ). The  $\text{pI}$  is the  $\text{pH}$  at which the protein or amino acid is electrically neutral, with an equal number of positive and negative charges. For individual amino acids this electrically neutral form is called a zwitterion. For most amino acids, the zwitterion form occurs when the amino group is protonated, the carboxyl group is deprotonated, and any side chain is electrically neutral. The exceptions to this general rule are arginine and lysine, two amino acids with basic side chains. For these amino acids, whose nitrogen-containing side chains have higher  $\text{pK}_a$  values than their amino groups, the zwitterion form occurs when the amino group is deprotonated (and therefore electrically neutral), while the nitrogenous side chain is protonated and the carboxyl group is deprotonated. The calculation of the  $\text{pI}$  for an amino acid was discussed in Chapter 1 of MCAT Biochemistry Review. For polypeptides, the isoelectric point is primarily determined by the relative numbers of acidic and basic amino acids. Isoelectric focusing exploits the acidic and basic properties of amino acids by separating on the basis of isoelectric point ( $\text{pI}$ ). The mixture of proteins is placed in a gel with a  $\text{pH}$  gradient (acidic gel at the positive anode, basic gel at the negative cathode, and neutral in the middle). An electric field is then generated across the gel. Proteins that are positively charged will begin migrating toward the cathode and proteins that are negatively charged will begin migrating toward the anode. As the protein reaches the portion of gel where the  $\text{pH}$  is equal to the protein's  $\text{pI}$ , the protein takes on a neutral charge and will stop moving. Anode in isoelectric focusing: A+ Anode has acidic ( $\text{H}^+$ -rich) gel and a (+) charge. Let's take a deeper look and see how this works. We'll start with a protein that has a  $\text{pI}$  of 9. When the protein is in an environment with a  $\text{pH}$  of 9, it will carry no net charge. If we place this protein onto the gel at a  $\text{pH}$  of 7, there will be more protons

around the protein. These protons will attach to the available basic sites on the protein, creating a net positive charge on the molecule. This charge will then cause the protein to be attracted to the negatively charged cathode, which is located on the basic side of the gradient. As the protein moves closer to the cathode, the pH of the gel slowly increases. Eventually, as the protein nears a pH of 9, the protons creating the positive charge will dissociate, and the protein will become neutral again. A quick way to remember the pH of each end of the gel is to recall that we associate acids with protons, which carry a positive charge, and thus the anode is positively charged. We associate bases with the negatively charged hydroxide ion, which gives us the negatively charged

Chromatography is another tool that uses physical and chemical properties to separate and identify compounds from a complex mixture. Chromatography refers to a variety of techniques that require the homogenized protein mixture to be fractionated through a porous matrix. One of the reasons chromatography is a valuable tool is that the isolated proteins are immediately available for identification and quantification. In all forms of chromatography discussed here, the concept is identical: the more similar the compound is to its surroundings (by polarity, charge, and so on), the more it will stick to and move slowly through its surroundings. Chromatography is preferred over electrophoresis when large amounts of protein are being separated. Chromatography and other separatory methods are also discussed in Chapter 12 of MCAT Organic Chemistry Review. The process begins by placing the sample onto a solid medium called the stationary phase or adsorbent. The next step is to run the mobile phase through the stationary phase. This will allow the sample to run through the stationary phase, or elute. Depending on the relative affinity of the sample for the stationary and mobile phases, different substances will migrate through at different speeds. That is, components that have a high affinity for the stationary phase will barely migrate at all; components with a high affinity for the mobile phase will migrate much more quickly. The amount of time a compound spends in the stationary phase is referred to as the retention time. Varying retention times of each compound in the solution results in separation of the components within the stationary

phase, or partitioning, as demonstrated in Figure 3.7. Each component can then be isolated individually for study. Figure 3.7 Partitioning of Black Ink Thin-layer chromatography; original spot placed on the bottom of the card. Components with high retention times remain near the bottom of the card; components with low retention times have migrated toward the top of the card. All chromatography is about the affinity of a substance for the mobile and stationary phases, except for size-exclusion chromatography. We can use myriad different media as our stationary phase, each one exploiting different properties that allow us to separate out our compound. In chromatography for protein separation, common properties include charge, pore size, and specific affinities. In column chromatography, a column is filled with silica or alumina beads as an adsorbent, and gravity moves the solvent and compounds down the column, shown in Figure 3.8. As the solution flows through the column, both size and polarity have a role in determining how quickly a compound moves through the polar silica or alumina beads: the less polar the compound, the faster it can elute through the column (short retention time). In column chromatography, the solvent polarity, pH, or salinity can easily be changed to help elute the protein of interest. Figure 3.8 Column Chromatography The sample is added at the top of the column and a solvent is poured over it. The more similar the sample is to the solvent (mobile phase), the more quickly it will elute; the more similar it is to the alumina or silica (stationary phase), the more slowly it will elute—if at all. Eventually, the solvent drips out of the end of the column, and different fractions that leave the column are collected over time. Each fraction contains bands that correspond to different compounds. After collection, the solvent can be evaporated and the compounds of interest kept. Column chromatography is particularly useful in biochemistry because it can be used to separate and collect other macromolecules besides proteins, such as In this method, the beads in the column are coated with charged substances, so they attract or bind compounds that have an opposite charge. For instance, a positively charged column will attract and hold a negatively charged protein as it passes through the column, either increasing its retention time or retaining it completely. After all other compounds have moved through the column, a salt

gradient is used to elute the charged molecules that have stuck to the column. In this method, the beads used in the column contain tiny pores of varying sizes. These tiny pores allow small compounds to enter the beads, thus slowing them down. Large compounds can't fit into the pores, so they will move around them and travel through the column faster. It is important to remember that in this type of chromatography, the small compounds are slowed down and retained longer—which may be counterintuitive. The size of the pores may be varied so that molecules of different molecular weights can be fractionated. A common approach in protein purification is to use an ion-exchange column followed by a size-exclusion column. We can also customize columns to bind any protein of interest by creating a column with high affinity for that protein. This can be accomplished by coating beads with a receptor that binds the protein or a specific antibody to the protein; in either case, the protein is retained in the column. Common stationary phase molecules include nickel, which is used in separation of genetically engineered proteins with histidine tags; antibodies or antigens; and enzyme substrate analogues, which mimic the natural substrate for an enzyme of interest. Once the protein is retained in the column, it can be eluted by washing the column with a free receptor (or target or antibody), which will compete with the bead-bound receptor and ultimately free the protein from the column. Eluents can also be created with a specific pH or salinity level that disrupts the bonds between the ligand and the protein of interest. The only drawback of the elution step is that the recovered substance can be bound to the eluent. If, for example, the eluent was an inhibitor of an enzyme, it could be difficult to remove.

**BIOCHEMISTRY**

**GUIDED EXAMPLE WITH EXPERT** Phospholipases A2 (PLA2) comprise a set of extracellular and intracellular enzymes that catalyze the hydrolysis of the sn-2 fatty acyl bond of phospholipids to yield fatty acids and lysophospholipids. The extracellular (secreted) PLA2 enzymes (sPLA2) have low molecular masses (13–18 kDa) and do not manifest significant fatty acid selectivity in vitro. Mammalian sPLA2 enzymes are well characterized; however, much less is known about aquatic sPLA2 enzymes and hence their study represents a great potential source for discovering new enzymes. Lots of intro details; of most importance is that PLA2 cuts This

passage is definitely going to focus on aquatic Pancreases from stingrays were harvested and subjected to multiple purification protocols, including ammonium sulfate precipitation and purification columns while monitoring sPLA2 activity. The final purification step involved a reverse phase high-performance liquid chromatography (RP-HPLC) C8 (nonpolar octylsilane) column, using a dynamic gradient composed of water and acetonitrile. As time increases, the proportion of water decreases and concentration of acetonitrile increases up to 80%. As seen below in Figure 1A, the eluate was monitored at 280 nm, and the fraction at 23 min was analyzed by 15% SDS-PAGE under reducing conditions and stained with Coomassie blue in Figure 1B. mobile phase (water Figure shows two Trends: Fig 1A: big peak at ~23 min at 1B: single band at Figure 1A (graph) and Figure 1B (blot) Adapted from Bacha, A. B., Karray, A., Bouchaala, E., Gargouri, Y., & Ali, Y. B. (2011). Purification and biochemical characterization of pancreatic phospholipase A2 from the According to the data, what is the approximate monomeric molecular weight of sPLA2? Why is it biologically relevant that sPLA2 required a high acetonitrile concentration to elute off the column? With "according to the data", this question stem is letting us know we'll need to use one or both parts of the figure to answer. So, let's start with a quick scan of the passage to see the topic and the kind of information presented to better understand the context of the data. The text is focused on a protein called phospholipase A2 (PLA2), and Figure 1 shows peaks with a gel picture inset. The bulk of the passage seems method-heavy (as indicated by the usage of column names and Figure references). We have two questions to answer: the first is asking for the size of the protein, while the second asks for a connection between the biology behind PLA2 and the way PLA2 interacts with the column. To determine the monomeric molecular weight of sPLA2, we'll need information from the SDS-PAGE data in Figure 1B. We know from our background content knowledge that an SDS-PAGE gel under reducing conditions will denature proteins and sever any disulfide bonds. Therefore, the bands that appear should only correspond to monomers, and monomers are what this question asked about. The first lane is a series of molecular weight standards measured in kilodaltons (kDa), which are used to estimate the molecular

weight of unknown proteins. We're told that the fraction at 23 minutes, which corresponds to the sPLA2 peak on the chromatogram, is analyzed in lane 2 of the gel. The band in lane 2 corresponding to sPLA2 is right next to the 14 kDa standard in lane 1, implying that the sPLA2 protein has a weight of approximately 14 kDa as well. As an extra measure of verification, paragraph 1 stated that sPLA2s have a molecular weight between 13–18. Paragraph 2 discusses the method of the experiment, which will help us answer the second part of the question stem. For all the detail in paragraph 2, RP-HPLC is just a type of a column chromatography. Like all types of column chromatography, RP-HPLC has a stationary phase (the column) and a mobile phase (the solvent). We're told that the column is nonpolar, which means nonpolar molecules will stick inside the column. We're also told that the solvent changes composition over time—starting as mostly water, but ending as mostly acetonitrile. Why is this change in composition significant? We recall that water is a polar solvent, while acetonitrile is closer to nonpolar. Therefore, early on, when the solvent is mostly water, polar molecules will flush out of the column because like dissolves like. But near the end of the experiment, when the solvent is mostly acetonitrile, the now nonpolar solvent will dislodge nonpolar molecules. So, nonpolar molecules will elute off the column near the end of the experiment. Finally, we observe that the sPLA2 protein elutes off the column near the end, when the solvent is mostly acetonitrile. This observation implies that the sPLA2 protein is net nonpolar; the nonpolar protein had initially stuck to the nonpolar column, but the protein eventually eluted out of the column once the solvent became nonpolar enough to solvate the protein. We can thus conclude that sPLA2 monomers have a molecular weight of around 14 kDa and, from the experimental procedure, we can conclude that sPLA2 proteins have a high affinity for nonpolar substances—first for the walls of the nonpolar column, and later for the nonpolar acetonitrile solvent. This behavior makes biological sense because the biological substrates of the sPLA2 protein are

MCAT CONCEPT CHECK 3.3 Before you move on, assess your understanding of the material with these questions.

1. What separation methods can be used to isolate a protein on the basis of isoelectric
2. What are the relative benefits of native



PAGE compared to SDS-PAGE? 3. What are two potential drawbacks of affinity chromatography? 4. True or False: In size-exclusion chromatography, the largest molecules elute first.

### 3.4 Protein Analysis

After Chapter 3.4, you will be able to:

- Recall the traits that are typically analyzed in proteins
- Describe the Edman degradation and the Bradford assay
- Recognize the limitations of protein separation and analysis techniques

NMR and other forms of spectroscopy are also discussed in Chapter 11 of MCAT Organic

### Separating proteins from one another

is generally only the first step in analysis. The next step is to study the isolated protein. Protein structure, function, or quantity is often of interest for a researcher or a commercial laboratory. Even after protein identification, protein analysis tools may be used. For example, in the case of protein synthesis for commercial use, purity of the product must be periodically assessed. The protein can be studied as a whole or broken down so that its parts can be examined. Protein structure can be determined through X-ray crystallography and nuclear magnetic resonance (NMR) spectroscopy. Before crystallographic analysis, the protein must be isolated and crystallized. X-ray crystallography is the most reliable and common method; 75 percent of the protein structures known today were analyzed through this method. Crystallography measures electron density on an extremely high-resolution scale and can also be used for nucleic acids. An X-ray diffraction pattern is generated in this method, as shown in Figure 3.9. The small dots in the diffraction pattern can then be interpreted to determine the protein's

### Figure 3.9 Diffraction Pattern in X-Ray Crystallography

The minority of protein structure determination (25 percent) has been accomplished through NMR, as discussed in Chapter 11 of MCAT Organic

### Amino Acid Composition

The amino acids that compose a protein can be determined by complete protein hydrolysis and subsequent chromatographic analysis. However, the random nature of hydrolysis prevents amino acid sequencing. To determine the primary structure of a protein, sequential digestion of the protein with specific cleavage enzymes is used. Small proteins are best analyzed with the Edman degradation, which uses cleavage to sequence proteins of up to 50 to 70 amino acids. The Edman degradation selectively and sequentially removes the N-terminal amino acid of the

protein, which can be analyzed via mass spectroscopy. Like PCR gene sequencing, protein amino acid sequencing can be automated in a stepwise manner. By combining the information from both techniques, researchers can determine where on a chromosome the gene coding a particular protein resides. For larger proteins, digestion with chymotrypsin, trypsin, and cyanogen bromide, a synthetic reagent, may be used. This digestion selectively cleaves proteins at specific amino acid residues, creating smaller fragments that can then be analyzed by electrophoresis or the Edman degradation. Because disulfide links and salt bridges are broken to reduce the protein to its primary structure, their positions cannot be determined by these methods. Protein activity is generally determined by monitoring a known reaction with a given concentration of substrate and comparing it to a standard. Activity is correlated with concentration but is also affected by the purification methods used and the conditions of the assay. Reactions with a color change have particular applicability because microarrays can rapidly identify the samples from a chromatographic analysis that contains the compound of interest. Concentration is determined almost exclusively through spectroscopy. Because proteins contain aromatic side chains, they can be analyzed with UV spectroscopy without any treatment; however, this type of analysis is particularly sensitive to sample contaminants. Proteins also cause colorimetric changes with specific reactions, particularly the bicinchoninic acid (BCA) assay, Lowry reagent assay, and Bradford protein assay. The Bradford method is most common because of its reliability and simplicity in

**Bradford Protein Assay** The Bradford protein assay mixes a protein in solution with Coomassie Brilliant Blue dye. The dye is protonated and green-brown in color prior to mixing with proteins, as depicted in Figure 3.10. The dye gives up protons upon binding to amino acid groups, turning blue in the process. Ionic attractions between the dye and the protein then stabilize this blue form of the dye; thus, increased protein concentrations correspond to a larger concentration of blue dye in solution. Samples of known protein concentrations are reacted with the Bradford reagent and then absorbance is measured to create a standard curve. The unknown sample is then exposed to the same conditions, and the concentration is

determined based on the standard curve. This is a very accurate method when only one type of protein is present in solution, but because of variable binding of the Coomassie dye with different amino acids, it is less accurate when more than one protein is present. The Bradford protein assay is limited by the presence of detergent in the sample or by excessive buffer.

Figure 3.10 Bradford Protein Assay The acidic form (left) has a brown-green hue; the basic form (right), which is created by interactions with proteins in solution, has a brilliant blue hue.

MCAT CONCEPT CHECK 3.4 Before you move on, assess your understanding of the material with these questions. 1. Why are proteins analyzed after isolation? 2. What factors would cause an activity assay to display lower activity than expected after concentration determination? 3. True or False: The Edman degradation proceeds from the carboxy (C-) terminus. In this chapter, we have explored the nonenzymatic aspects of proteins as well as the ways proteins can be analyzed. The cellular proteins and their functions that we discussed included structural proteins that play a role in cytoskeletal architecture, motor proteins involved in muscle contraction and movement along the cytoskeleton, and other proteins that play more complex roles such as binding, immunologic function, and biosignaling. The more complex proteins involved in biosignaling highlighted in this chapter included ion channels, enzyme-linked receptors, and G protein-coupled receptors. Finally, we determined how to isolate and identify a protein and its relevant properties. In the next chapter, we'll turn our attention to another class of biomolecules: carbohydrates. As we transition from amino acids, peptides, and proteins to monosaccharides, oligosaccharides, and polysaccharides, look for key connections between the different types of macromolecules used by the body for structure and as fuel sources. In the end, all biomolecules are related to each other through metabolism, which we'll explore in Chapters 9 through 12 of MCAT Biochemistry Review. You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources! Structural proteins compose the cytoskeleton, anchoring proteins, and much of the extracellular matrix. The most common structural proteins are collagen, elastin, keratin, actin, and tubulin. They are generally fibrous

in nature. Motor proteins have one or more heads capable of force generation through a conformational change. They have catalytic activity, acting as ATPases to power movement. Muscle contraction, vesicle movement within cells, and cell motility are the most common applications of motor proteins. Common examples include myosin, kinesin, and dynein. Binding proteins bind a specific substrate, either to sequester it in the body or hold its concentration at steady state. Cell adhesion molecules (CAM) allow cells to bind to other cells or Cadherins are calcium-dependent glycoproteins that hold similar Integrins have two membrane-spanning chains and permit cells to adhere to proteins in the extracellular matrix. Some also have Selectins allow cells to adhere to carbohydrates on the surfaces of other cells and are most commonly used in the immune system. Antibodies (or immunoglobulins, Ig) are used by the immune system to target a specific antigen, which may be a protein on the surface of a pathogen (invading organism) or a toxin. Immunoglobulins contain a constant region and a variable region; the variable region is responsible for antigen binding. Two identical heavy chains and two identical light chains form a single antibody; they are held together by disulfide linkages and Ion channels can be used for regulating ion flow into or out of a cell. There are three main types of ion channels. Ungated channels are always open. Voltage-gated channels are open within a range of membrane Ligand-gated channels open in the presence of a specific binding substance, usually a hormone or neurotransmitter. Enzyme-linked receptors participate in cell signaling through extracellular ligand binding and initiation of second messenger G protein-coupled receptors have a membrane-bound protein associated with a trimeric G protein. They also initiate second Ligand binding engages the G protein. GDP is replaced with GTP; the  $\alpha$  subunit dissociates from the  $\beta$  and The activated  $\alpha$  subunit alters the activity of adenylate cyclase or GTP is dephosphorylated to GDP; the  $\alpha$  subunit rebinds to the  $\beta$  and  $\gamma$  subunits. Electrophoresis uses a gel matrix to observe the migration of proteins in response to an electric field. Native PAGE maintains the protein's shape, but results are difficult to compare because the mass-to-charge ratio differs for each SDS-PAGE denatures the proteins and masks the native charge so that comparison of size is

more accurate, but the functional protein cannot be recaptured from the gel. Isoelectric focusing separates proteins by their isoelectric point (pI); the protein migrates toward an electrode until it reaches a region of the gel where  $\text{pH} = \text{pI}$  of the protein. Chromatography separates protein mixtures on the basis of their affinity for a stationary phase or a mobile phase. Column chromatography uses beads of a polar compound, like silica or alumina (stationary phase), with a nonpolar solvent. Ion-exchange chromatography uses a charged column and a variably saline eluent. Size-exclusion chromatography relies on porous beads. Larger molecules elute first because they are not trapped in the small pores. Affinity chromatography uses a bound receptor or ligand and an eluent with free ligand or a receptor for the protein of interest. Protein structure is primarily determined through X-ray crystallography after the protein is isolated, although NMR can also be used. Amino acid composition can be determined by simple hydrolysis, but amino acid sequencing requires sequential degradation, such as the Edman degradation. Activity levels for enzymatic samples are determined by following the process of a known reaction, often accompanied by a color change. Protein concentration is also determined colorimetrically, either by UV spectroscopy or through a color change reaction. BCA assay, Lowry reagent assay, and Bradford protein assay each test for protein and have different advantages and disadvantages. The Bradford protein assay, which uses a color change from brown to blue, is most common.

Answers to Concept Checks

1. Cytoskeletal proteins tend to be fibrous with repeating domains, while motor proteins tend to have ATPase activity and binding heads. Both types of protein function in cellular motility.
2. False. An enzyme is a protein or RNA molecule with catalytic activity, which motor proteins do have. Motor function is generally considered nonenzymatic, but the ATPase functionality of motor proteins indicates that these molecules do have catalytic activity.
3. If the binding protein is present in sufficiently high quantities relative to the substrate, nearly all substrate will be bound despite a low affinity.

Cell Adhesion Molecule Type of Adhesion

- Two cells of the same or similar type using calcium
- One cell to proteins in the extracellular matrix
- One cell to carbohydrates, usually on the surface of other cells

5. Antigen-antibody interactions can result in neutralization of the

pathogen or toxin, opsonization (marking) of the antigen for destruction, or creation of insoluble antigen-antibody complexes that can be phagocytized and digested by macrophages (agglutination). 2. Ungated channels are always open. 3. Transport kinetics display both  $K_m$  and  $v_{max}$  values. They also can be cooperative, like some binding proteins. However, transporters do not have analogous  $K_{eq}$  values for reactions because there is no catalysis.

1. Isoelectric focusing and ion-exchange chromatography both separate proteins based on charge; the charge of a protein in any given environment is determined by its isoelectric point (pI). 2. Native PAGE allows a complete protein to be recovered after analysis; it also more accurately determines the relative globular size of proteins. SDS-PAGE can be used to eliminate conflation from mass-to-charge 3. The protein of interest may not elute from the column because its affinity is too high or it may be permanently bound to the free receptor in the eluent. 4. True. The small pores in size-exclusion chromatography trap smaller particles, retaining them in the column.

1. Protein isolation is generally only the first step in an analysis. The protein identity must be confirmed by amino acid analysis or activity. With unknown proteins, classification of their features is generally 2. Contamination of the sample with detergent or SDS could yield an artificially increased protein level, leading to lower activity than expected (because the protein concentration was calculated as higher than its actual value). Alternatively, the enzyme could have been denatured during isolation and analysis. 3. False. The Edman degradation proceeds from the amino (N-) terminus.

Science Mastery Assessment In most electrophoresis experiments, we attempt to separate out one component from the others. Because we are attempting to isolate protein A only, a pH that causes protein A to be negative while proteins B and C are neutral or positive will be best. pH 5.5 accomplishes this goal; proteins B and C will be positively charged. A pH of 4.5, (C), would make protein A neutral, and it would thus not migrate across the gel. Any neutral impurities would also remain in the well with protein A, making this pH not the best Sodium dodecyl sulfate is a detergent and will digest proteins to form micelles with uniform negative charges. Because the protein is sequestered within the micelle, other factors such as charge of the

protein and shape have minimal roles during separation. In essence, the protein micelles can be modeled as being spheres, dependent only on size. From the given choices, all of them are involved in cell movement with the exception of (D). Centrioles are composed of microtubules, but are involved in mitosis, not cell migration. The most prevalent extracellular proteins are keratin, elastin, and collagen. Tubulin and actin are the primary cytoskeletal proteins, while myosin is a motor protein. For a ligand present in low quantities to have a strong action, we expect it to initiate a second messenger cascade system. Second messenger systems amplify signals because enzymes can catalyze a reaction more than once while they are active, and often activate other enzymes. Both enzyme-linked receptors and G protein-coupled receptors use second messenger systems, while ion channels do not. Ions that are not readily accessible in the cytoplasm or extracellular space are likely to be bound to a binding protein. Classically, calcium and magnesium are protein-bound. Without this background knowledge, the question can still be answered. Sodium, (A), and potassium, (B), must exist in their free states to participate in action potentials. Chloride, (C), is readily excreted by the kidney, which would not be true if it were protein-bound. Calcium must be sequestered in both the bloodstream and intracellularly because calcium is used for muscle contraction, exocytosis (of neurotransmitters and other signals), and many other cellular processes that must be tightly regulated. Antibodies are specific to a single antigen. Each B-cell produces a single type of antibody with a constant region that is specific to the host and a variable region that is specific to an antigen. The resting membrane potential is displayed by cells that are not actively involved in signal transduction. Ungated or "leak" channels permit limited free flow of ions, while the sodium-potassium pump is also active and corrects for this leakage. Ligand-gated and voltage-gated channels are involved in cell signaling and in the pacemaker potentials of certain cells, but cause deviation from—not maintenance of—the resting membrane. All trimeric G proteins have  $\alpha$ ,  $\beta$ , and  $\gamma$  subunits—(A), (B), and (C), respectively.  $G_s$ ,  $G_i$ , and  $G_q$  are subtypes of the  $G_\alpha$  subunit of the trimeric G protein and differ depending on the G protein-coupled receptor's function. The proteins described in the question differ primarily in

their molecular weights. Their pI values are very close, so ion-exchange chromatography, (A), is not a good choice. The question specifies a large quantity, which is better processed through chromatography than through electrophoresis— (C) and (D)—because the gel can only handle a small volume of protein. The overall pI of a protein is determined by the relative number of acidic and basic amino acids. The basic amino acids are arginine, lysine, and histidine, and the acidic amino acids are aspartic acid and glutamic acid. Glycine's side chain is a hydrogen atom, so it will have the least contribution of all the amino acids. The gel in isoelectric focusing uses a pH gradient. When a protein is in a region with a pH above its pI, it is negatively charged and moves toward the anode. When it is in a pH region below its pI, it is positively charged and moves toward the cathode. When the pH equals the pI, the migration of the protein is halted. UV spectroscopy is best used with conjugated systems of double bonds. While the double bond in the peptide bond does display resonance, this is not adequate for UV absorption. However, aromatic systems are conjugated, and phenylalanine, tyrosine, and tryptophan all contain aromatic ring. Protein activity and concentration are generally correlated. Because we have a high concentration of protein, we expect a high activity unless the protein has been damaged or inactivated in some way. The protein could have been inactivated by experimental conditions like detergents, heat, or pH; however, these are not answer choices. Rather, we must consider how the experimental procedure works. Protein elutes off of an affinity column by binding free ligand. In this situation, the binding may not have been reversed and thus the free ligand competes for the active site of the enzyme, lowering its activity. The selective cleavage of proteins by digestive enzymes allows fragments of different lengths with known amino acid endpoints to be created. By cleaving the protein with several different enzymes, a basic outline of the amino acid sequence can be created. Consult your online resources for additional practice. Equations to Remember (3.1)

Migration velocity:  $v = \frac{Ez}{4\pi\eta r}$

Ez Biochemistry Chapter 1 Amino Acids, Peptides, and Proteins Biology Chapter 1 Biology Chapter 8 The Immune System Biology Chapter 11 The Musculoskeletal System General Chemistry Chapter 12 Organic Chemistry Chapter 12 Separations and



Purifications Carbohydrate Structure and Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate.

**How to Use This Assessment**

If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one.

If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect.

If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. When glucose is in a straight-chain formation, it:

- A. is an aldoketose.
- B. is a pentose.
- C. has five chiral carbons.
- D. is one of a group of 16 stereoisomers.

2. All of the following are true of epimers EXCEPT:

- A. they differ in configuration about only one carbon.
- B. they usually have slightly different chemical and physical
- C. they are diastereomers (with the exception of glyceraldehyde).
- D. they have equal but opposite optical activities.

3. Aldonic acids are compounds that:

- A. can be oxidized, and therefore act as reducing agents.
- B. can be reduced, and therefore act as reducing agents.
- C. have been oxidized, and have acted as

reducing agents. D. have been oxidized, and have acted as oxidizing agents. 4. The formation of  $\alpha$ -D-glucopyranose from  $\beta$ -D-glucopyranose is 5. Ketose sugars may have the ability to act as reducing sugars. Which process explains this? A. Ketose sugars undergo tautomerization. B. The ketone group is oxidized directly. C. Ketose sugars undergo anomerization. D. The ketone group is reduced directly. 6. What is the product of the following reaction? 7. Which of the following enzymes cleaves polysaccharide chains and yields maltose exclusively? C. Debranching enzyme D. Glycogen phosphorylase 8. When the following straight-chain Fischer projection is converted to a chair or ring conformation, its structure will be: 9. Why is the  $\alpha$ -anomer of D-glucose less likely to form than the  $\beta$  - A. The  $\beta$ -anomer is preferred for metabolism. B. The  $\beta$ -anomer undergoes less electron repulsion. C. The  $\alpha$ -anomer is the more stable anomer. D. The  $\alpha$ -anomer forms more in L-glucose. 10. Which two polysaccharides share all of their glycosidic linkage types in common? A. Cellulose and amylopectin B. Amylose and glycogen C. Amylose and cellulose D. Glycogen and amylopectin 11. Which of the following is digestible by humans and is made up of only one type of monosaccharide? 12. The reaction below is an example of one step in: A. aldehyde formation. B. hemiketal formation. D. glycosidic bond cleavage. 13. Galactose is the C-4 epimer of glucose, the structure of which is shown below. Which of the following structures is galactose? 14. Andersen's disease (glycogen storage disease type IV) is a condition characterized by a deficiency in glycogen branching enzyme. Absence of this enzyme would be likely to cause all of the following effects EXCEPT: A. decreased glycogen solubility in human cells. B. slower action of glycogen phosphorylase. C. less storage of glucose in the body. D. glycogen devoid of  $\alpha$ -1,4 linkages. 15. The cyclic forms of monosaccharides are: A. I only B. III only C. I and II only D. I, II, and III

Answer Key follows on next page.

Carbohydrate Structure and In This Chapter

4.1 Carbohydrate Classification

4.2 Cyclic Sugar Molecules

Oxidation and Reduction

4.4 Complex Carbohydrates

The content in this chapter should be relevant to about 4% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories: 1D: Principles of bioenergetics and fuel molecule metabolism 5D: Structure, function, and reactivity of

biologically-relevant molecules Carbohydrates (or, as they are known colloquially, carbs) have experienced a tumultuous few decades in American culinary culture. Remember the food pyramid, which advised that we consume 6 to 11 servings of carbohydrates—in the form of bread, cereal, rice, and pasta—per day? Nowadays, we're inundated with recommendations to cut down or even cut out carbs; still, carbohydrates make up most of the food and drink that continues to fill our refrigerators and cupboards. Whether or not this is healthy is debatable, as research on food choices continues. What is certain, however, is that carbohydrates are the most direct source of chemical energy for almost all organisms, ranging from single-celled protozoa to more complex organisms, such as plants and animals—including people. From a molecular standpoint, carbohydrates used to be defined by the empirical formula  $C_n(H_2O)_n$ , but this definition is now considered antiquated. This formula only applies to simple monomeric sugars, which are also called monosaccharides. As simple sugars link to form complex sugars, water loss occurs, thus changing the empirical formula to  $C_n(H_2O)_m$  for complex sugars. In this chapter, we'll discuss how the various types of carbohydrates we utilize for metabolism are classified, the structures in which they exist, and the biochemical reactions they undergo.

#### 4.1 Carbohydrate Classification

After Chapter 4.1, you will be able to:

- Recognize common features of sugar nomenclature
- Apply principles of stereoisomerism to sugar nomenclature and structure
- Distinguish enantiomers from epimers
- Classify and name a simple sugar based on its structure

Carbohydrates come in many types. They can be classified by the number of sugar moieties that make them up, the number of carbons in each sugar, the functional groups present on the molecule, and the stereochemistry of the

The MCAT likes to present complex, novel molecules and then test you on the most basic information about them. Therefore, when dealing with carbohydrates on the exam, look for the functional groups we have seen before (aldehydes, ketones, and alcohols) and realize that they retain the same chemical properties that you already know. Whenever we discuss carbohydrates (or anything else in biology), it makes sense to start with the most basic structural units, which are monosaccharides. The simplest monosaccharides contain three carbon atoms and are

called trioses. Carbohydrates with four, five, and six carbon atoms are called tetroses, pentoses, and hexoses, respectively. Carbohydrates that contain an aldehyde group as their most oxidized functional group are called aldoses and those with a ketone group as their most oxidized functional group are called ketoses. Taken together, a six- carbon sugar with an aldehyde group would be called an aldohexose, while a five-carbon sugar with a ketone group would be called a ketopentose. The basic structure of a monosaccharide is illustrated by the simple sugar glyceraldehyde, which is an aldose as shown in Figure 4.1.

**Figure 4.1 Glyceraldehyde** The simplest aldose (an aldotriose) Glyceraldehyde is a polyhydroxylated aldehyde, or as described above, an aldose (aldehyde sugar). The numbering of carbon atoms in a monosaccharide follows the rules described in Chapter 1 of MCAT Organic Chemistry Review. The carbonyl carbon is the most oxidized, and therefore will always have the lowest possible number. In an aldose, the aldehyde carbon will always be carbon number one (C-1). The aldehyde carbon can participate in glycosidic linkages; sugars acting as substituents via this linkage are called glycosyl residues. The simplest ketone sugar (ketose) is dihydroxyacetone, shown in Figure 4.2. Again, the carbonyl carbon is the most oxidized; in this case, the lowest number it can be assigned is carbon number two (C-2). This is true, in fact, for most ketoses on the MCAT: the carbonyl carbon is C-2. Ketoses can also participate in glycosidic bonds at this carbon. Notice that on every monosaccharide, every carbon other than the carbonyl carbon will carry a

**Figure 4.2 Dihydroxyacetone** The simplest ketose (a ketotriose) On the MCAT, a few sugars are tested by referencing their common names, or names that do not necessarily follow the nomenclature rules listed above. You should be familiar with the names of the important monosaccharides listed in Figure 4.3.

**Figure 4.3 Common Names of Frequently Tested Sugars on the MCAT**

**BIOCHEMISTRY GUIDED EXAMPLE WITH EXPERT** Carbohydrate-based wound dressings have received increased attention in recent years for their occlusive and functionally interactive properties. They afford bacterial and odor protection, fluid balance, and elasticity. However, since all modern dressings had the same efficacy in healing as saline or paraffin gauze, there is opportunity to improve on

cotton-based dressings. Proteases like human neutrophil elastase are found in high concentration in chronic wounds, which create considerable growth factor and extracellular matrix protein destruction, preventing the wound from healing. Wound dressings that selectively sequester elastase from chronic wounds are built on the concept that the properties of the protease can be used to tailor the molecular design of the wound dressing. Elastase is a glycoprotein and contains a significant carbohydrate portion shown to be glycosamine-based. There are advantages, but want to make better negative effects of elastase in wounds. We're interested in designing the sugar-based bandages to understand the reasons why the potential for carbohydrate-carbohydrate interactions between the protein and a monosaccharide conjugated to cellulose dressing. There may be additional carbohydrate-protein interactions through the active site. In this study, researchers compared the preparation and activity of elastase in the presence of monosaccharides conjugated to citrate-cellulose. bandages will work to sugar works best to A series of monosaccharides (Figure 1) were linked to cotton-cellulose gauze with an acid-catalyzed citric acid reaction. Varying amounts of treated gauze samples were submerged with 1 unit/mL of elastase for one hour at room temperature, after which each individual gauze sample was removed. Any unbound elastase was assayed by monitoring the spectrophotometric release of p-nitroaniline at 410 nm from the enzymatic hydrolysis of the nitroanilide. The initial activity of remaining elastase for each monosaccharide at specific amounts of treated gauze was plotted below. Different sugars in Figure A linked to different amounts of gauze added with set amount of elastase, then gauze removed; come back to this diagram if needed. IVs: amount of gauze, type of sugar. DV: slope, which corresponds to initial. have less steep lines. Adapted from Edwards, J. V., & Caston-Pierre, S. (2013). Citrate-linked keto- and aldo-hexose monosaccharide cellulose conjugates demonstrate selective human neutrophil elastase-lowering activity in cotton dressings. *Journal of Functional Biomaterials*, 4(2), 59-73. According to the data, which class of monosaccharide should be used in gauze to help prevent elastase-mediated? The question asks us to select a type of monosaccharide to prevent. understand the purpose of the

passage and what the data tells us. The first paragraph describes how advantageous bandages currently are, but that researchers are interested in improving them by selectively binding proteases that prevent healing, like elastase. Let's take a look at the experimental setup in paragraph 2. Since the sugar-linked bandages are soaked in a solution with elastase and then removed, the assumption is that the better the sugar binds elastase, the less elastase there is left over in the solution when the researchers assay it, after the bandage is removed. Therefore, the better the binding, the less activity there should be. The figure clearly has two sets of lines: galactose/allose/mannose have activity over a larger amount of fiber used, and, based on Figure 1, all three of these sugars are aldohexoses, which are sugars with an aldehyde at the C-1 position. Sorbose/tagatose/psicose/fructose, however, quickly drop in activity with increasing amounts of fiber, and, based on Figure 1, all four of these sugars are ketohexoses, which are sugars with a ketone at the C-2 position. To make the comparison a bit more clear, let's consider the activity for each set at 5 mg of fiber—ketohexoses have  $1.5 \times 10^3$  slope, and aldohexoses have  $3.3 \times 10^3$  slope. Since slope corresponds to activity, less activity is seen for ketohexoses with equivalent amounts of carbohydrate-bound bandage, therefore corresponding to more. Therefore, we can conclude that the researchers should investigate the usage of ketohexoses to help prevent elastase-mediated wound damage, since this class of sugar seems to bind elastase better than aldohexoses. Isomerism is discussed in detail in Chapter 2 of MCAT Organic Chemistry Review. The isomerism seen in carbohydrates is just an extension of that conversation; many sugars are related to each other as enantiomers or diastereomers. Optical isomers, also called stereoisomers, are compounds that have the same chemical formula; these molecules differ from one another only in terms of the spatial arrangement of their component atoms. A special type of isomerism exists between stereoisomers that are nonidentical, nonsuperimposable mirror images of each other. These molecules are called enantiomers. A chiral carbon atom is one that has four different groups attached to it; any molecule that contains chiral carbons and no internal planes of symmetry has an enantiomer. The two systems for naming chiral carbons are not

interchangeable! While some D-isomers are equivalent with (R), others are (S). When dealing with biomolecules like sugars, anticipate using the biochemists' method of nomenclature: D and L. When trying to figure out how many possible stereoisomers can exist for a multi-carbon compound, identify the number of chiral carbons ( $n$ ) and plug into the formula  $2^n$ . For example,  $2^1 = 2$  stereoisomers and  $2^2 = 4$  stereoisomers. Figure 4.4 illustrates the two enantiomers of glyceraldehyde: D- and L- glyceraldehyde. The particular three-dimensional arrangement of the groups attached to the chiral carbon determines the compound's absolute configuration. While organic chemists use the newer (R) and (S) system when denoting absolute configuration, biochemists use the older D and L system. Notice in the figure above that d-glyceraldehyde and L- glyceraldehyde are mirror images of one another—this makes them enantiomers because they must have opposite absolute configurations. Because there is only one chiral carbon present, these are the only two stereoisomers that exist for glyceraldehyde. As the number of chiral carbons increases, so too does the number of possible stereoisomers because one compound may have many diastereomers. The number of possible stereoisomers of a compound can be calculated by:  $2^n$  where  $n$  is the number of chiral carbons in the molecule. Early in the twentieth century, scientists used glyceraldehyde to learn about the optical rotation of sugars. The results of this early study led to the d and l naming convention. d-Glyceraldehyde was later determined to exhibit a positive rotation (designated as d-(+)-glyceraldehyde), and L-glyceraldehyde a negative rotation (designated as L-(-)-glyceraldehyde). Note that the direction of rotation, (+) or (-), must be determined experimentally and cannot be determined from the d or l designation for the sugar. On the MCAT, all monosaccharides are assigned the d or l configuration based on their relationship to glyceraldehyde. The Fischer projection is a simple two-dimensional drawing of stereoisomers. Recall that in a Fischer projection, the horizontal lines are wedges (out of the page), while

vertical lines are dashes (into the page), as shown in Figure 4.5. Figure 4.5 Fisher Projection

Horizontal lines are wedges (out of the page); vertical lines are dashes (into the page). Fischer projections allow scientists to identify different enantiomers. Using this system of structural representation, all d-sugars have the hydroxide of their highest-numbered chiral center on the right, and all L-sugars have that hydroxide on the left. Because d-glucose and L-glucose are enantiomers, this means that every chiral center in d-glucose has the opposite configuration of L-glucose, as shown in Figure 4.6. Figure 4.6 Enantiomers of Glucose

Make sure that you are familiar with these three types of stereoisomers:

1. The same sugars, in different optical families, are enantiomers (such as d-glucose and L-glucose).
2. Two sugars that are in the same family (both are either ketoses or aldoses, and have the same number of carbons) that are not identical and are not mirror images of each other are diastereomers.
3. A special subtype of diastereomers are those that differ in configuration at exactly one chiral center. These are defined as epimers (such as d-ribose and d-arabinose, which only differ at C-2, as shown in Figure 4.7). Figure 4.7 D-Ribose and D-Arabinose Are C-2 Epimers

A summary of these different types of isomers is provided in Figure 4.8, which shows four different stereoisomers of an aldotetrose, including two optical forms of erythrose and two optical forms of threose. Figure 4.8 Four Stereoisomers of an Aldotetrose

Because D-erythrose and L-erythrose are nonsuperimposable mirror images of one another, they are enantiomers. On the other hand, while D-erythrose and D-threose are not mirror images of one another, they are still nonsuperimposable, which makes them diastereomers. Similarly, L- erythrose and D-threose are diastereomers. Because they differ in configuration at only one chiral center, they can also be defined as epimers of one another. Remember, a compound can have only one enantiomer (the left hand to its right hand, or vice versa), but may have multiple diastereomers, depending on how many (and which) chiral carbons are inverted between the two molecules.

**MCAT CONCEPT CHECK 4.1** Before you move on, assess your understanding of the material with these questions.

1. What is the name for a five-carbon sugar with an aldehyde group? A six-carbon sugar with a ketone group?
2. Draw all of the possible



D-stereoisomers of glucose in Fischer projection form. 3. Which of the diastereomers of glucose from the previous question are considered to be epimers of glucose? Enantiomers?

### 4.2 Cyclic Sugar Molecules

After Chapter 4.2, you will be able to:

- Convert between Haworth and Fischer projections
- Define and explain sugar-related concepts, including hemiacetal, hemiketal, pyranose, furanose, and anomeric carbon
- Predict the impact of mutarotation on conformation
- Identify the more stable anomer of a given sugar

Monosaccharides contain both a hydroxyl group, which can serve as a nucleophile, and a carbonyl group, which is the most common electrophile on the MCAT. Therefore, they can undergo intramolecular reactions to form cyclic hemiacetals (from aldoses) and hemiketals (from ketoses). Due to ring strain, the only cyclic molecules that are stable in solution are six-membered pyranose rings or five-membered furanose rings. In fact, such sugars tend to exist predominantly in cyclic form. The hydroxyl group acts as the nucleophile during ring formation, so oxygen becomes a member of the ring structure. Regardless of whether hemiacetal or hemiketal is formed, the carbonyl carbon becomes chiral in this process, and is referred to as the anomeric carbon. Figure 4.9 demonstrates how the carbonyl containing C-1 and the hydroxyl group on C-5 of D-glucose undergo intramolecular hemiacetal formation. One of two ring forms can emerge during cyclization of a sugar molecule:  $\alpha$  or  $\beta$ . Because these two molecules differ at the anomeric carbon, they are termed anomers of one another. In glucose, the  $\alpha$ -anomer has the OH group of C-1 trans to the  $\text{-CH}_2\text{OH}$  substituent (axial and down), whereas the  $\beta$ -anomer has the OH group of C-1 cis to the  $\text{CH}_2\text{OH}$  substituent (equatorial and up).

### Figure 4.9 Cyclic Sugar Formation via Intramolecular Nucleophilic Addition

Glucose forms a six-membered ring with two anomeric forms:  $\alpha$  (left) and  $\beta$ . Note how Figure 4.9 above has two kinds of projections for glucopyranose: the Haworth projection and the Fischer projection. The Haworth projection is a useful method for describing the three-dimensional conformations of cyclic structures. Haworth projections depict cyclic sugars as planar five- or six-membered rings with the top and bottom faces of the ring nearly perpendicular to the page. In reality the five-membered rings are very close to planar, but the pyranose rings adopt a chair-like

configuration, and the substituents assume axial or equatorial positions to minimize steric hindrance. When we convert the monosaccharide from its straight-chain Fischer projection to the Haworth projection, any group on the right in the Fischer projection will point down. Exposing hemiacetal rings to water will cause them to spontaneously cycle between the open and closed form. Because the substituents on the single bond between C-1 and C-2 can rotate freely, either the  $\alpha$ - or  $\beta$ -anomer can be formed, as demonstrated in Figure 4.10. This spontaneous change of configuration about C-1 is known as mutarotation, and occurs more rapidly when the reaction is catalyzed with an acid or base. Mutarotation results in a mixture that contains both  $\alpha$ - and  $\beta$ -anomers at equilibrium concentrations (for glucose: 36%  $\alpha$ , 64%  $\beta$ ). In solution, the  $\alpha$ -anomeric configuration is less favored because the hydroxyl group of the anomeric carbon is axial, adding to the steric strain of the molecule. In its solid state (not in solution), this preference can be mitigated by the anomeric effect, which helps stabilize the  $\alpha$ -anomer, although this is outside the scope of the Figure 4.10 Mutarotation Interconversion between the  $\alpha$ - and  $\beta$ -anomers via ring opening and reclosing

MCAT CONCEPT CHECK 4.2

Before you move on, assess your understanding of the material with these questions.

1. Explain the relationship between the carbonyl carbon, anomeric carbon, and the alpha and beta forms of a sugar molecule.
2. Draw the less stable anomer of D-glucose in Haworth projection form.
3. Draw the less stable anomer of D-glucose in chair configuration.

After Chapter 4.3, you will be able to:

- Predict the products of sugar reactions, including oxidation, reduction, esterification, and glycosidic linkage formation
- Contrast Tollens' reagent and Benedict's reagent
- Apply reactions of sugars to biological contexts

Monosaccharides contain alcohols and either aldehydes or ketones. As such, these functional groups undergo the same reactions that they do when present in other compounds. These include oxidation and reduction, esterification, and nucleophilic attack (creating glycosides).

Oxidation and Reduction One of the most important biochemical reactions in the human body is the oxidation of carbohydrates in order to yield energy. As monosaccharides switch between anomeric configurations, the hemiacetal rings spend a short period of time in the open-chain

aldehyde form. Just like other aldehydes, they can be oxidized to carboxylic acids; these oxidized aldoses are called aldonic acids. Because aldoses can be oxidized, they are considered reducing agents. Therefore, any monosaccharide with a hemiacetal ring is considered a reducing sugar. When the aldose in question is in ring form, oxidation yields a lactone instead—a cyclic ester with a carbonyl group persisting on the anomeric carbon, as shown in Figure 4.11. Lactones, such as vitamin C, play an essential role in the human body.

Figure 4.11 Lactone Contains a cyclic ester

Two standard reagents are used to detect the presence of reducing sugars: Tollens' reagent and Benedict's reagent. Tollens' reagent must be freshly prepared, starting with silver nitrate ( $\text{AgNO}_3$ ), which is mixed with NaOH to produce silver oxide ( $\text{Ag}_2\text{O}$ ). Silver oxide is dissolved in ammonia to produce  $[\text{Ag}(\text{NH}_3)_2]^+$ , the actual Tollens' reagent. Tollens' reagent is reduced to produce a silvery mirror when aldehydes are present. When Benedict's reagent is used, the aldehyde group of an aldose is readily oxidized, indicated by a red precipitate of  $\text{Cu}_2\text{O}$ , as demonstrated in Figure 4.12. To test specifically for glucose, one may utilize the enzyme glucose oxidase, which does not react with other reducing sugars. A more powerful oxidizing agent, such as dilute nitric acid, will oxidize both the aldehyde and the primary alcohol (on C-6) to carboxylic acids.

Figure 4.12 Positive Test for an Aldose Using Benedict's Reagent

Aldoses will react, forming copper(I) oxide; ketones may react more slowly. An interesting phenomenon is that ketose sugars are also reducing sugars and give positive Tollens' and Benedict's tests. Although ketones cannot be oxidized directly to carboxylic acids, they can tautomerize to form aldoses under basic conditions, via keto-enol shifts. While in the aldose form, they can react with Tollens' or Benedict's reagents to form the carboxylic acid. Tautomerization refers to the rearrangement of bonds in a compound, usually by moving a hydrogen and forming a double bond. In this case, the ketone group picks up a hydrogen while the double bond is moved between two adjacent carbons, resulting in an enol: a compound with a double bond and an alcohol group. Reduced sugars also play an essential role in human biochemistry. When the aldehyde group of an aldose is reduced to an alcohol, the compound is considered an alditol. A deoxy sugar, on the other hand, contains a hydrogen

that replaces a hydroxyl group on the sugar. The most well-known of these sugars is D-2-deoxyribose, the carbohydrate found in DNA. Because carbohydrates have hydroxyl groups, they are able to participate in reactions with carboxylic acids and carboxylic acid derivatives to form esters, as shown in Figure 4.13. Figure 4.13 Esterification of Glucose Acetic anhydride used as carboxylic acid In the body, esterification is very similar to the phosphorylation of glucose, in which a phosphate ester is formed. Phosphorylation of glucose is an extremely important metabolic reaction of glycolysis in which a phosphate group is transferred from ATP to glucose, thus phosphorylating glucose while forming ADP, as shown in Figure 4.14. Hexokinase (or glucokinase, in the liver and pancreatic  $\beta$ -islet cells) catalyzes this reaction. Figure 4.14 Phosphorylation of Glucose The action of hexokinase and glucokinase (as well as all the key glycolytic enzymes) is discussed in Chapter 9 of MCAT Biochemistry Review. Hemiacetals react with alcohols to form acetals. The anomeric hydroxyl group is transformed into an alkoxy group, yielding a mixture of  $\alpha$ - and  $\beta$ - acetals (with water as a leaving group). The resulting carbon–oxygen (CO) bonds are called glycosidic bonds, and the acetals formed are glycosides. An example is the reaction of glucose with ethanol shown in Figure 4.15. Equivalent reactions happen with hemiketals, forming ketals. Figure 4.15 Glycosidic Linkage Formation Hemiacetal (or hemiketal) sugars react with alcohols under acidic conditions to form acetals (or ketals). Disaccharides and polysaccharides form as a result of glycosidic bonds between monosaccharides. Glycosides derived from furanose rings are referred to as furanosides and those derived from pyranose rings are called pyranosides. Note that glycoside formation is a dehydration reaction; thus, breaking a glycosidic bond requires hydrolysis. MCAT CONCEPT CHECK 4.3 Before you move on, assess your understanding of the material with these questions. 1. Explain the difference between esterification and glycoside formation. 2. What purpose do Tollens' reagent and Benedict's reagent serve? How do they differ from each other? 3. From a metabolic standpoint, does it make sense for carbohydrates to get oxidized or reduced? What is the purpose of this process? 4.4 Complex Carbohydrates After Chapter 4.4, you will be able to: Compare starches,

glycogen, and cellulose Predict the comparative solubility of different starch forms based on structure Recognize important biologically relevant disaccharides Complex carbohydrates include all carbohydrates with at least two sugar molecules linked together (disaccharides, oligosaccharides, and As discussed previously, monosaccharides react with alcohols to form acetals. Glycosidic bonds formed between hydroxyl groups of two monosaccharides result in the formation of a disaccharide, as shown in Figure 4.16 Disaccharide Formation The hydroxyl group on the anomeric carbon reacts with the hydroxyl of another sugar to form an acetal (or ketal) with a 1,2; 1,4; or 1,6 glycosidic linkage. Formation of an  $\alpha$ - or  $\beta$ -glycosidic linkage is nonspecific in that the anomeric carbon of a cyclic sugar can react with any hydroxyl group on any other sugar molecule. The linkages are named for the configuration of the anomeric carbon and the numbers of the hydroxyl-containing carbons involved in the linkage. For example, in an  $\alpha$ -1,6 glycosidic bond formation between two D-glucose molecules, the  $\alpha$ -anomeric carbon of the first glucose (C-1) attaches to C-6 of the second glucose. Note that the second glucose could be either the  $\alpha$ - or  $\beta$ -anomer. In the event that a glycosidic bond is formed between two anomeric carbons, this must be specified in the name. For example, a bond formed between the anomeric carbons of two  $\alpha$ - d-glucose molecules would be termed an  $\alpha,\alpha$ -1,1 linkage, as demonstrated in Figure 4.17 Trehalose Example of a disaccharide with an  $\alpha,\alpha$ -1,1 linkage between the  $\alpha$ -anomeric carbons of two glucose molecules Various combinations of monosaccharides linked by glycosidic bonds result in the formation of different disaccharides. For instance, two glucose molecules linked by an  $\alpha$ -1,4 glycosidic bond is called maltose, while two glucose molecules joined by a  $\beta$ -1,4 linkage is called cellobiose. When discussing disaccharides in a real-world context, the most important of these sugars are sucrose, lactose, and maltose. These disaccharides are commonly produced in the cell by enzymatic activity. Their molecular structures and linkages are highlighted in Figure 4.18. Figure 4.18 Important Disaccharides (a) Sucrose (glucose- $\alpha$ -1,2-fructose), (b) Lactose (galactose- $\beta$ -1,4-glucose), (c) Maltose (glucose- $\alpha$ -1,4-glucose) Polysaccharides are long chains of monosaccharides linked together by glycosidic bonds. While glucose is the most frequently

encountered monosaccharide, it is not the only one. A polysaccharide composed entirely of glucose (or any other monosaccharide) is referred to as a homopolysaccharide, while a polymer made up of more than one type of monosaccharide is considered a heteropolysaccharide. The three most important biological polysaccharides are cellulose, starch, and glycogen. Although these three polysaccharides have different functions, they are all composed of the same monosaccharide, D-glucose. These polysaccharides differ in configuration about the anomeric carbon and the position of glycosidic bonds, resulting in notable biological differences. Because glycosidic bonding can occur at multiple hydroxyl groups in a monosaccharide, polymer formation can either be linear or branched. Branching happens when an internal monosaccharide in a polymer chain forms at least two glycosidic bonds, allowing branch formation. We'll take a closer look at how this is a key part of glycogen synthesis and glycogenolysis in Chapter 9 of MCAT Biochemistry Review. Cellulose is the main structural component of plants. A homopolysaccharide, cellulose is a chain of  $\beta$ -D-glucose molecules linked by  $\beta$ -1,4 glycosidic bonds, with hydrogen bonds holding the actual polymer chains together for support. Humans are not able to digest cellulose because we lack the cellulase enzyme responsible for hydrolyzing cellulose to glucose monomers. Therefore, cellulose found in fruits and vegetables serves as a great source of fiber in our diet, drawing water into the gut. Cellulase is produced by some bacteria found in the digestive tract of certain animals, such as termites, cows, and goats, which enables them to digest cellulose. A portion of a cellulose chain can be seen in Figure 4.19 below.

**Figure 4.19 Cellulose Structure**

Cellulose is a polymer of 1,4-linked  $\beta$ -D- Starches are polysaccharides that are more digestible by humans because they are linked  $\alpha$ -D-glucose monomers. Plants predominantly store starch as amylose, a linear glucose polymer linked via  $\alpha$ -1,4 glycosidic bonds. Another type of starch is amylopectin, which starts off with the same type of linkage that amylose exhibits, but also contains branches via  $\alpha$ -1,6 glycosidic bonds. Iodine is a well-known reagent that tests for the presence of starch and does so by fitting inside the helix conformation amylose typically makes, forming a starch-iodine complex. The structure of amylose is depicted in Figure 4.20.

Figure 4.20 Starch Structure Starches are polymers of 1,4-linked  $\alpha$ -D-glucose. The contrast between cellulose and starch digestibility exemplifies the specificity of enzymes. A slight  $109.5^\circ$  rotation of the anomeric carbon to form  $\beta$ -linkages (instead of  $\alpha$ - linkages) is enough to make the molecule indigestible by any enzymes in humans—even though they're both D-glucose polymers! Enzyme specificity is discussed in Chapter 2 of MCAT Biochemistry Review. Starches like amylose and amylopectin are broken down by enzymes in the body and are used as a source of energy. Amylose is degraded by  $\alpha$ -amylase and  $\beta$ -amylase.  $\beta$ -Amylase cleaves amylose at the nonreducing end of the polymer (the end with acetal) to yield maltose, while  $\alpha$ -amylase cleaves randomly along the chain to yield shorter polysaccharide chains, maltose, and glucose. Because amylopectin is highly branched, debranching enzymes help degrade the polysaccharide chain. Hers disease, also known as glycogen storage disease (GSD) type VI, is a condition characterized by a deficiency in liver glycogen phosphorylase. Patients with this disease cannot break down glycogen in their livers and therefore have hepatomegaly (a swollen liver). They may also have hypoglycemia (low blood sugar) between meals because they cannot use glycogen to maintain blood glucose concentrations. Glycogen is a carbohydrate storage unit in animals. It is similar to starch, except that it has more  $\alpha$ -1,6 glycosidic bonds (approximately one for every 10 glucose molecules, while amylopectin has approximately one for every 25), which makes it a highly branched compound. This branching optimizes the energy efficiency of glycogen and makes it more soluble in solution, thereby allowing more glucose to be stored in the body. Also, its branching pattern allows enzymes that cleave glucose from glycogen, such as glycogen phosphorylase, to work on many sites within the molecule simultaneously. Glycogen phosphorylase functions by cleaving glucose from the nonreducing end of a glycogen branch and phosphorylating it, thereby producing glucose 1-phosphate, which plays an important role in MCAT CONCEPT CHECK 4.4 Before you move on, assess your understanding of the material with these questions. 1. Which of the two forms of starch is more soluble in solution. Why? 2. Regarding glycogen and amylopectin, which of these two polymers should experience a higher rate of enzyme activity from enzymes

that cleave side This chapter examined, in depth, the unique characteristics of carbohydrates. Monosaccharides are the most basic form of carbohydrates, and in terms of human biochemistry, they typically range from three to seven carbon atoms. Classifying these monomers depends on the number of chiral centers present, which tells us the number of potential stereoisomers. Open-chain structures are most easily represented through Fischer projection diagrams; however, sugars tend to exist in ring form in biological systems, so Haworth projections are also used to depict three-dimensional structure. The most important reactions monosaccharides undergo are redox reactions, esterification, and glycoside formation—particularly when glycoside formation results in the formation of disaccharides. Polysaccharides are formed by glycosidic bonding of carbohydrates, and the polymers cellulose, starch, and glycogen are most commonly found in nature. Glycogen is the primary storage form of glucose in humans and other animals, and its unique branching structure allows for rapid access to these glucose stores. The body has two primary energy-storage molecules: glycogen and triacylglycerols. Each has its own pros and cons—glycogen is more rapidly mobilized, but requires water of hydration, which increases its weight. Triacylglycerols serve as a long-term repository of energy, but take time to utilize. In the next chapter, we turn our attention to triacylglycerols, as well as the lipids used for structure and cell signaling. You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources! Carbohydrates are organized by their number of carbon atoms and Common names are also frequently used when referring to sugars, such as glucose, fructose, and galactose. Three-carbon sugars are trioses, four-carbon sugars are tetroses, and so on. Sugars with aldehydes as their most oxidized group are aldoses; sugars with ketones as their most oxidized group are ketoses. The nomenclature of all sugars is based on the D- and L-forms of glyceraldehyde. Sugars with the highest-numbered chiral carbon with the OH group on the right (in a Fischer projection) are D-sugars; those with the OH on the left are L-sugars. D- and L-forms of the same sugar are enantiomers. Diastereomers are nonsuperimposable configurations of molecules with similar



connectivity. They differ at at least one—but not all— chiral carbons. These also include epimers and anomers. Epimers are a subtype of diastereomers that differ at exactly one Anomers are a subtype of epimers that differ at the anomeric Cyclic Sugar Molecules Cyclization describes the ring formation of carbohydrates from their When rings form, the anomeric carbon can take on either an  $\alpha$ - or  $\beta$ - The anomeric carbon is the new chiral center formed in ring closure; it was the carbon containing the carbonyl in the straight-  $\alpha$ -anomers have the OH on the anomeric carbon trans to the free  $\beta$ -anomers have the OH on the anomeric carbon cis to the free Haworth projections provide a good way to represent three- Cyclic compounds can undergo mutarotation, in which they shift from one anomeric form to another with the straight-chain form as an Monosaccharides are single carbohydrate units, with glucose as the most commonly observed monomer. They can undergo three main reactions: oxidation–reduction, esterification, and glycoside Aldoses can be oxidized to aldonic acids and reduced to alditols. Sugars that can be oxidized are reducing agents (reducing sugars) themselves, and can be detected by reacting with Tollens' or Sugars with a H replacing an OH group are termed deoxy Sugars can react with carboxylic acids and their derivatives, forming esters (esterification). Phosphorylation is a similar reaction in which a phosphate ester is formed by transferring a phosphate group from ATP onto a sugar. Glycoside formation is the basis for building complex carbohydrates and requires the anomeric carbon to link to another Disaccharides form as result of glycosidic bonding between two monosaccharide subunits; polysaccharides form by repeated monosaccharide or polysaccharide glycosidic bonding. Common disaccharides include sucrose (glucose- $\alpha$ -1,2-fructose), lactose (galactose- $\beta$ -1,4-glucose), and maltose (glucose- $\alpha$ -1,4- Polysaccharides play various roles: Cellulose is the main structural component for plant cell walls and is a main source of fiber in the human diet. Starches (amylose and amylopectin) function as a main energy storage form for plants. Glycogen functions as a main energy storage form for animals. Answers to Concept Checks 1. Aldopentose; ketohexose 3. D-Glucose's epimers are D-mannose (C-2), D-allose (C-3), and D- galactose (C-4). None of the

D-stereoisomers is an enantiomer for glucose; L-glucose is the enantiomer of D-glucose. 1. During hemiacetal or hemiketal formation, the carbonyl carbon becomes chiral and is termed the anomeric carbon. The orientation of the OH substituent on this carbon determines if the sugar molecule is the  $\alpha$ - or  $\beta$ -anomer. 1. Esterification is the reaction by which a hydroxyl group reacts with either a carboxylic acid or a carboxylic acid derivative to form an ester. Glycoside formation refers to the reaction between an alcohol and a hemiacetal (or hemiketal) group on a sugar to yield an alkoxy group. 2. Tollens' reagent and Benedict's reagent are used to detect the presence of reducing sugars. Tollens' reagent is reduced to produce a silvery mirror when aldehydes are present whereas Benedict's reagent is indicated by a reddish precipitate of  $\text{Cu}_2\text{O}$ . 3. It makes sense for carbohydrates to become oxidized while reducing other groups. This is the case because aerobic metabolism requires reduced forms of electron carriers to facilitate processes such as oxidative phosphorylation. Because carbohydrates are a primary energy source, they are oxidized. 1. Amylopectin is more soluble in solution than amylose because of its branched structure. The highly branched structure of amylopectin decreases intermolecular bonding between polysaccharide polymers and increases interaction with the surrounding solution. 2. Glycogen has a higher rate of enzymatic branch cleavage because it contains significantly more branching than amylopectin. Science Mastery Assessment Glucose is an aldohexose, meaning that it has one aldehyde group and six carbons. Given this information, (A) and (B) can be eliminated. In aldose sugars, each nonterminal carbon is chiral. Therefore, glucose has four chiral centers, not five, as mentioned in (C). The number of stereoisomers possible for a chiral molecule is  $2^n$ , where  $n$  is the number of chiral carbons. Because glucose has four chiral centers, there are  $2^4 = 16$  possible stereoisomers. Epimers are monosaccharide diastereomers that differ in their configuration about only one carbon. As with all diastereomers, epimers have different chemical and physical properties, and their optical activities have no relation to each other. Enantiomers have equal but opposite optical activities. Therefore, (D) is the only statement that does not apply to epimers. Aldonic acids form after the aldehyde group on a reducing sugar reduces

another compound, becoming oxidized in the process. Mutarotation is the interconversion between anomers of a compound. Enantiomerization and racemization, (C) and (D), are related: enantiomerization is the formation of a mirror-image or optically inverted form of a compound, whereas racemization is moving a solution toward an equal concentration of both enantiomers. Glycosidation, (A), is the addition of a sugar to another compound. Ketose sugars undergo tautomerization, a rearrangement of bonds, to undergo keto-enol shifts. This forms an aldose, which then allows them to act as reducing sugars. A ketone group alone cannot be oxidized. Anomerization, mentioned in (C), refers to ring closure of a monosaccharide, creating an anomeric carbon. When glucose reacts with methanol under acid catalysis, the hemiacetal is converted to an acetal via replacement of the anomeric hydroxyl group with an alkoxy group. The result is a type of acetal known as a glycoside. This corresponds with (B). The other choices all show alkoxy groups on the wrong carbon, or too many carbons.  $\beta$ -Amylase cleaves amylose at the nonreducing end of the polymer to yield maltose exclusively, while  $\alpha$ -amylase, (A), cleaves amylose anywhere along the chain to yield short polysaccharides, maltose, and glucose. Debranching enzyme, (C), removes oligosaccharides from a branch in glycogen or starches, while glycogen phosphorylase, (D), yields glucose 1-phosphate. Start by drawing out the Haworth projection. Recall that all the groups on the right in the Fischer projection will go on the bottom of the Haworth projection, and all the groups on the left will go on the top. Next, draw the chair structure, with the oxygen in the back right corner. Label the carbons in the ring 1 through 5, starting from the oxygen and moving clockwise around the ring. Now, draw in the lines for all the axial substituents, alternating above and below the ring. Remember to start on the anomeric C-1 carbon, where the axial substituent points down. Now start filling in the substituents. The substituent can be in either position on the anomeric carbon, so skip that one for now. The OH groups on C-2 and C-4 should point downward while the OH group on C-3 should point upward; (C), the  $\beta$ -anomer of D-glucose, is the only one that matches. The hydroxyl group on the anomeric carbon of the  $\beta$ -anomer is equatorial, thereby creating less nonbonded strain

than the  $\alpha$ -anomer, which has the hydroxyl group of the anomeric carbon in axial position. Glycogen and amylopectin are the only polysaccharide forms that demonstrate branching structure, making them most similar in terms of linkage. Both glycogen and amylopectin use  $\alpha$ -1,4 and  $\alpha$ -1,6 linkages. Cellulose uses  $\beta$ -1,4 linkages and amylose does not contain  $\alpha$ -1,6 linkages. While maltose and cellobiose both have the same glucose subunits, only maltose is digestible by humans because the  $\beta$ -glycosidic linkages in cellobiose cannot be cleaved in the human body. In solution, the hemiacetal ring of glucose will break open spontaneously and then re-form. When the ring is broken, bond rotation occurs between C-1 and C-2 to produce either the  $\alpha$ - or the  $\beta$ -anomer. The reaction given in this question depicts the mutarotation of glucose. (A) is incorrect because the reactant is an aldehyde, not the product. (B) is incorrect because a hemiketal has an OH group, an OR group, and two R groups. In addition, hemiketals are formed from ketones, and our starting reactant is an aldehyde. Finally, (D) is incorrect because there is no glycosidic bond in the starting reactant. Galactose is a diastereomer of glucose, with the stereochemistry at C-4 (counting from the aldehyde) reversed. Being able to identify C-4 is enough to answer this question, even without looking at the glucose molecule. Because (B), (C), and (D) have identical stereochemistry at C-4, they are

In Andersen's disease, glycogen is less branched than normal, thereby inducing lower solubility of glycogen. Branches reduce the interactions between adjacent chains of glycogen and encourage interactions with the aqueous environment. The smaller number of branches means that glycogen phosphorylase has fewer terminal glucose monomers on which to act, making enzyme activity slower than normal overall. Finally, without branches, the density of glucose monomers cannot be as high; therefore, the total glucose stored is lower than normal. Glycogen synthase is still functioning normally, so we would expect normal  $\alpha$ -1,4 linkages in the glycogen of an individual with Andersen's disease but few (if any)  $\alpha$ -1,6

Monosaccharides can exist as hemiacetals or hemiketals, depending on whether they are aldoses or ketoses. When a monosaccharide is in its cyclic form, the anomeric carbon is attached to the oxygen in the ring and a hydroxyl group. Hence, it is only a hemiacetal or

hemiketal because an acetal or ketal would require the OH group to be converted to another

Consult your online resources for additional practice. Equations to Remember (4.1) Number of stereoisomers with common backbone =  $2^n$  Biochemistry Chapter 9 Carbohydrate Metabolism I Biochemistry Chapter 10 Carbohydrate Metabolism II Organic Chemistry Chapter 1 Organic Chemistry Chapter 2 Organic Chemistry Chapter 5 Organic Chemistry Chapter 6 Aldehydes and Ketones I Lipid Structure and Function

Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate.

**How to Use This Assessment**

If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one. If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect. If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. Which of the following is NOT a type of glycolipid?

2. During saponification: A. triacylglycerols undergo a condensation reaction. B. triacylglycerols undergo

ester hydrolysis. C. fatty acid salts are produced using a strong acid. D. fatty acid salts are bound to albumin. 3. Which of the following best describes the structure of steroids? A. Three cyclopentane rings, one cyclohexane ring B. Three cyclohexane rings, one cyclopentane ring C. Four carbon rings, differing in structure for each steroid D. Three cyclic carbon rings and a functional group 4. Soap bubbles form because fatty acid salts organize into: C. phospholipid bilayers. D. hydrogen bonds. 5. Steroid hormones are steroids that: I. have specific high-affinity receptors. II. travel in the bloodstream from endocrine glands to distant III. affect gene transcription by binding directly to DNA. A. I only B. III only C. I and II only D. I and III only 6. Why are triacylglycerols used in the human body for energy A. They are highly hydrated and therefore can store lots of B. They always have short fatty acid chains for easy access by C. The carbon atoms of the fatty acid chains are highly reduced and therefore yield more energy upon oxidation. D. Polysaccharides, which would actually be a better energy storage form, would dissolve in the body. 7. Which of the following is correct about fat-soluble vitamins? I. Vitamin E is important for calcium regulation. II. Vitamin D protects against cancer because it is a biological III. Vitamin K is necessary for the posttranslational introduction of IV. Vitamin A is metabolized to retinal, which is important for sight. A. III only B. I and II only C. III and IV only D. II, III, and IV only 8. Which of the following is true of amphipathic molecules? A. They form protective spheres in any solvent, with hydrophobic molecules interior and hydrophilic molecules exterior. B. They have two fatty acid chains and a polar head group. C. They are important to the formation of the phospholipid bilayer and soap bubbles. D. They have a glycerol base. 9. Which of the following is/are true about sphingolipids? I. They are all phospholipids. II. They all contain a sphingosine backbone. III. They can have either phosphodiester or glycosidic linkages to their polar head groups. A. I only B. III only C. II and III only D. I, II, and III 10. Which of the following statements about saturation is FALSE? A. It can describe the number of double or triple bonds in a fatty B. It determines at least one of the properties of membranes. C. More saturated fatty acids make for a more fluid solution. D. Fully saturated fatty acids have only single bonds. 11. Which of the following is true about

glycerophospholipids? A. Glycerophospholipids can sometimes be sphingolipids, depending on the bonds in their head groups. B. Glycerophospholipids are merely a subset of phospholipids. C. Glycerophospholipids are used in the ABO blood typing D. Glycerophospholipids have one glycerol, one polar head group, and one fatty acid tail. 12. Which of the following statements about terpenes is FALSE? A. Terpenes are strongly scented molecules that sometimes serve protective functions. B. Terpenes are steroid precursors. C. A triterpene is made of three isoprene moieties, and therefore has 15 carbons. D. Terpenes are made by plants and insects. 13. Which of the following is true about cholesterol? A. Cholesterol always increases membrane fluidity in cells. B. Cholesterol is a steroid hormone precursor. C. Cholesterol is a precursor for vitamin A, which is produced in D. Cholesterol interacts only with the hydrophobic tails of 14. Which of the following statements regarding prostaglandins is A. Prostaglandins regulate the synthesis of cAMP. B. Prostaglandin synthesis is inhibited by NSAIDs. C. Prostaglandins affect pain, inflammation, and smooth muscle D. Prostaglandins are endocrine hormones, like steroid 15. Which of the statements regarding waxes is FALSE? A. Waxes generally have melting points above room B. Waxes are produced only in plants and insects and therefore must be consumed by humans. C. Waxes protect against dehydration and parasites. D. Waxes are esters of long-chain fatty acids and long-chain

**Lipid Structure and Function**

In This Chapter

5.1 Structural Lipids

5.2 Signaling Lipids

Terpenes and Terpenoids

5.3 Energy Storage

Free Fatty Acids and Saponification

The content in this chapter should be relevant to about 3% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories: 1D: Principles of bioenergetics and fuel molecule metabolism 3A: Structure and functions of the nervous and endocrine systems, and ways in which these systems coordinate the organ systems 5D: Structure, function, and reactivity of biologically-relevant molecules

What do beer, human eyes, and sperm whales have in common? For all of these, lipids play a key role in some of their most interesting characteristics. The taste and smell of hops comes from lipids called terpenes. The ability of the human eye to respond to light (and therefore see) relies heavily on retinal, a lipid derived

from vitamin A. Sperm whales use an enormous reservoir of spermaceti to dive to a depth of up to three kilometers to hunt giant squid. Spermaceti is a lipid with a density that changes dramatically with temperature—effectively allowing sperm whales to adjust their density with depth so that they can stay submerged without having to constantly Lipids, as a class, are characterized by insolubility in water and solubility in nonpolar organic solvents. Aside from this shared feature, lipids diverge dramatically in their structural organization and biological functions, serving vital structural, signaling, and energy storage roles. In this chapter, we will explore the structural and functional characteristics of each of the major categories of lipids tested on the MCAT. As structural building blocks, we will investigate phospholipids and sterols, which make up vesicles, liposomes, and membranes. When it comes to signaling, we will note that lipids serve multiple roles, from enzyme cofactors to light-absorbing pigments, and from intracellular messengers to hormones. Finally, we will see that lipids are the workhorse of energy storage, giving the most “bang” for the metabolic “buck” by weight.

### 5.1 Structural Lipids

After Chapter 5.1, you will be able to:

- Recall the major structural traits of phospholipids, glycerophospholipids, and sphingolipids
- Recognize how membrane lipid structure contributes to overall membrane structure
- Distinguish between the three types of lipids
- Identify the polar and nonpolar regions of lipids

Lipids are the major component of the phospholipid bilayer, one of the most important structural parts of the cell. The unique ability of phospholipids to form a bilayer allows our cells to function as they do, separating the cell interior from the surrounding environment. We will first take a close look at the structure and role of phospholipids, glycerophospholipids, and sphingolipids. Finally, we will review the gross structural characteristics of the unique class called waxes. Each of the membrane components is an amphipathic molecule, meaning that it has both hydrophilic and hydrophobic regions. For these membrane lipids, the polar head is the hydrophilic region, whereas the fatty acid tails are the hydrophobic region. When placed in aqueous solution, these molecules spontaneously form structures that allow the hydrophobic regions to group internally while the hydrophilic regions interact with water. This leads to the formation of



various structures, including liposomes, micelles, and the phospholipid bilayer, shown in Figure 5.1. Figure 5.1 Membrane Lipids Form Various Structures in Aqueous Solutions

Although phospholipids are indeed the largest component of the phospholipid bilayer, nonphospholipids like glycolipids also play a role—and can be an important part of processes like cell recognition and signaling, discussed in Chapter 3 of MCAT Biochemistry. Phospholipids contain the following elements: a phosphate and alcohol that comprise the polar head group, joined to a hydrophobic fatty acid tail by phosphodiester linkages. One or more fatty acids are attached to a backbone to form the hydrophobic tail region. Phospholipids can be further classified according to the backbone on which the molecule is built. For example, glycerol, a three-carbon alcohol, forms phosphoglycerides or glycerophospholipids, and sphingolipids have a sphingosine backbone. One important thing to note, however, is that not all sphingolipids are phospholipids, as described later in this chapter. Lipid properties—for all categories of lipids—are determined by the degree of saturation in fatty acid chains and the functional groups to which the fatty acid chains are bonded. One thing that these lipids do all share in common is a tail composed of long-chain fatty acids. These hydrocarbon chains vary by their degree of saturation and length. These two properties determine how the overall molecule will behave. Fully saturated fatty acid tails will have only single bonds; the carbon atom is considered saturated when it is bonded to four other atoms, with no  $\pi$  bonds. Saturated fatty acids, such as those in butter, have greater van der Waals forces and a more stable overall structure. Therefore, they form solids at room temperature. An unsaturated fatty acid includes one or more double bonds. Double bonds introduce kinks into the fatty acid chain, which makes it difficult for them to stack and solidify. Therefore, unsaturated fats—like olive oil—tend to be liquids at room temperature. The same rules apply in the phospholipid bilayer: phospholipids with unsaturated fatty acid tails make up more fluid regions of the phospholipid bilayer. Phospholipids, glycerophospholipids, and sphingolipids can have any of a variety of fatty acid tails and also different head groups, which determine their properties at the surface of the cell membrane. The next two sections—glycerophospholipids and

sphingolipids —focus on the various polar head groups that different phospholipids may have. As mentioned in the last section, glycerophospholipids are all phospholipids; yet, not all phospholipids are glycerophospholipids! Glycerophospholipids (or phosphoglycerides) are specifically those phospholipids that contain a glycerol backbone bonded by ester linkages to two fatty acids and by a phosphodiester linkage to a highly polar head group, as shown in Figure 5.2. Because the head group determines the membrane surface properties, glycerophospholipids are named according to their head group. For example, phosphatidylcholine is the name of a glycerophospholipid with a choline head group, and phosphatidylethanolamine is one with an ethanolamine head group. The head group can be positively charged, negatively charged, or neutral. The membrane surface properties of these molecules make them very important to cell recognition, signaling, and binding. Within each subtype, the fatty acid chains can vary in length and saturation, resulting in an astounding variety of functions that are the focus of active scientific research.

Figure 5.2 Structure of a Glycerophospholipid X denotes the head group connected to the glycerol backbone by a phosphodiester linkage. Although experiments in blood transfusion are recorded as early as the 17th century, blood typing wasn't developed until the 20th century. With the advent of the ABO and Rh factor blood typing systems, blood transfusions could now be successfully administered to patients with hemophilia (a clotting disorder that causes significant bleeding), during surgery, and in a number of other applications. Blood typing makes it possible to give life-saving blood transfusions without risking potentially fatal acute hemolytic reactions. The ABO blood typing system is based on cell-surface antigens on red blood cells. These cell-surface antigens are some of the most well-known sphingolipids. Like glycerophospholipids, sphingolipids are also sites of biological recognition at the cell surface and can be bonded to various head groups and fatty acids. Sphingolipids have a sphingosine or sphingoid (sphingosine-like) backbone, as opposed to the glycerol backbone of glycerophospholipids. These molecules also have long-chain, nonpolar fatty acid tails and polar head groups. Many sphingolipids are also phospholipids because they contain a phosphodiester linkage.

However, other sphingolipids contain glycosidic linkages to sugars; any lipid linked to a sugar can be termed a glycolipid. Sphingolipids are divided into four major subclasses, differing by their head group. The simplest sphingolipid is ceramide, which has a single hydrogen atom as its head group. Sphingomyelins are the major class of sphingolipids that are also phospholipids (sphingophospholipids). These molecules have either phosphocholine or phosphoethanolamine as a head group, and thus contain a phosphodiester bond. Sphingomyelin head groups have no net charge. As the name implies, sphingomyelins are major components in the plasma membranes of cells producing myelin (oligodendrocytes and Schwann cells), the insulating sheath for axons. Sphingolipids with head groups composed of sugars bonded by glycosidic linkages are considered glycolipids, as mentioned above, or, more specifically, glycosphingolipids. These molecules are not phospholipids because they contain no phosphodiester linkage. Glycosphingolipids are found mainly on the outer surface of the plasma membrane and can be further classified as cerebrosides or globosides. Cerebrosides have a single sugar, whereas globosides have two or more. These molecules are also referred to as neutral glycolipids because they have no net charge at Sphingolipid accumulation is associated with numerous pathological conditions. Sphingomyelins found in the myelin sheath help in signal transduction. Accumulation of sphingomyelin, resulting from lack of the enzyme sphingomyelinase, can result in Niemann–Pick disease. Symptoms can include intellectual disability and seizures. Sulfatides are sulfated cerebrosides associated with Alzheimer's disease. The final group is composed of the most complex sphingolipids. Gangliosides are glycolipids that have polar head groups composed of oligosaccharides with one or more N-acetylneuraminic acid (NANA; also called sialic acid) molecules at the terminus and a negative charge. These molecules are also considered glycolipids because they have a glycosidic linkage and no phosphate group. Gangliosides play a major role in cell interaction, recognition, and signal transduction. A summary of the different types of sphingolipids is provided in Figure 5.3.

Figure 5.3 Types of Sphingolipids

Ceramide has a single hydrogen atom for a head group; sphingomyelins have phosphodiester linkages (phospholipids); cerebrosides

have one sugar; globosides (not pictured) have multiple sugars; gangliosides have oligosaccharides and terminal sialic acids. Gangliosides are the “gangly” sphingolipids, with the most complex structure and functional groups (oligosaccharides and NANA) in all directions. Waxes are esters of long-chain fatty acids with long-chain alcohols. As one might expect, they form pliable solids at room temperature (what we generally think of as wax). Biologically, they function as protection for both plants and animals. In plants, waxes are secreted as a surface coating to prevent excessive evaporation and to protect against parasites. In animals, waxes are secreted to prevent dehydration, as a water-repellant to keep skin and feathers dry, and as lubricant. For example, carnauba wax is made from the leaves of the *Copernicia prunifera* palm and is used to coat candies and wax cars. Bees secrete waxes to construct shelter, as shown in Figure 5.4.

**Figure 5.4 Honeycomb Structure Made from Beeswax**

The solid and plastic nature of waxes, which contain esters with long alkyl chains, permits their use for structure building.

**MCAT CONCEPT CHECK 5.1** Before you move on, assess your understanding of the material with these questions.

1. Which components of membrane lipids contribute to their structural role in membranes? Which components contribute to function?
2. What is the difference between a sphingolipid that is also a phospholipid and one that is NOT?
3. Name the three main types of sphingolipids and their characteristics. Phospholipid or Glycolipid?
4. What would happen if an amphipathic molecule were placed in a nonpolar solvent rather than an aqueous solution?

**5.2 Signaling Lipids**

After Chapter 5.2, you will be able to:

- Recall the structural features of terpenes, steroids, and prostaglandins
- Differentiate steroids from steroid hormones
- Connect prostaglandins to the symptoms associated with their presence, such as pain and inflammation
- Explain the importance of fat-soluble vitamins: A, D, E, and K

Remember from Chapter 2 of MCAT Biochemistry Review that a coenzyme is an organic, nonprotein factor bound to an enzyme and required for its normal activity. In addition to passive roles in structure, lipids also perform active roles in cellular signaling and as coenzymes. Lipids serve as coenzymes in the electron transport chain and in glycosylation reactions. Lipids also function as hormones that

transmit signals over long distances and as intracellular messengers responding to extracellular signals. Certain special lipids with conjugated double bonds absorb light, which is extremely important for vision; others act as pigments in plants and animals. Here, we will focus on three important categories of signaling lipids: steroids, prostaglandins, and fat-soluble vitamins, as well as important precursors like terpenes. Terpenes and Terpenoids

Before we delve into the details of downstream lipid signaling molecules, we must first turn our attention to terpenes. These odiferous chemicals are the metabolic precursors to steroids and other lipid signaling molecules, and have varied independent functions. Terpenes are a class of lipids built from isoprene ( $C_5H_8$ ) moieties and share a common structural pattern with carbons grouped in multiples of five, as shown in Figure 5.5. Figure 5.5 Isoprene Terpenes are produced mainly by plants and also by some insects. They are generally strongly scented. In some cases, these pungent chemicals are part of the plant or insect's protective mechanism. The strong smell of turpentine, a derivative of resin, comes from the monoterpenes that are resin's major components; terpenes actually get their name from their original discovery in turpentine. Terpenes are also the primary components of much more pleasant-smelling essential oils extracted from plants. Terpenes are grouped according to the number of isoprene units present; a single terpene unit contains two isoprene units. Monoterpenes ( $C_{10}H_{16}$ ), which are abundant in both essential oils and turpentine as described above, contain two isoprene units. Sesquiterpenes (sesqui- meaning one-and-a-half) contain three isoprene units, and diterpenes contain four. Vitamin A, which will be discussed later in this chapter, is a diterpene from which retinal, a visual pigment vital for sight, is derived. Triterpenes, with six isoprene units, can be converted to cholesterol and various steroids, also discussed later in this chapter. Carotenoids, like  $\beta$ -carotene and lutein, are tetraterpenes and have eight isoprene units. Natural rubber has isoprene chains between 1000 and 5000 units long and is therefore considered a Terpenoids, also sometimes referred to as isoprenoids, are derivatives of terpenes that have undergone oxygenation or rearrangement of the carbon skeleton. These compounds are further modified, as are terpenes, by the addition of an

extensive variety of functional groups. Terpenoids share similar characteristics with terpenes in terms of both biological precursor function and aromatic properties, contributing to steroid biosynthesis, as well as the scents of cinnamon, eucalyptus, camphor, turmeric, and numerous other compounds. Terpenoids are named in an analogous fashion, with diterpenoids deriving from four isoprene units and so on. Terpenes and terpenoids are precursor molecules that feed into various biosynthesis pathways that produce important products, including steroids, which have widespread effects on biological function, and vitamin A, which is vital to sight. The term steroid probably brings to mind muscle-bound body builders or home run-hitting professional athletes. In science, and on the MCAT, steroid refers not just to the infamously abused anabolic steroids, but also to a broader class of molecules defined by their structure. Structurally, steroids, shown in Figure 5.6, are metabolic derivatives of terpenes and are very different from the lipids mentioned earlier in this chapter in both structure and function. Steroids are characterized by having four cycloalkane rings fused together: three cyclohexane and one cyclopentane. Steroid functionality is determined by the oxidation status of these rings, as well as the functional groups they carry. It is important to note that the large number of carbons and hydrogens make steroids nonpolar, like the other lipids mentioned. Figure 5.6

Common Steroid Structure

Hormone types, including steroid hormones, are the focus of Chapter 5 of Kaplan MCAT. Keep in mind the terminology difference between steroids and steroid hormones. Steroid refers to a group defined by a particular chemical structure, demonstrated above. Steroid hormones are steroids that act as hormones, meaning that they are secreted by endocrine glands into the bloodstream and then travel on protein carriers to distant sites, where they can bind to specific high-affinity receptors and alter gene expression levels. Steroid hormones are potent biological signals that regulate gene expression and metabolism, affecting a wide variety of biological systems even at low concentrations. Some important steroid hormones include testosterone, various estrogens, cortisol, and aldosterone, which are discussed in Chapter 5 of MCAT Biology Review. Plants, like animals, also use steroids as signaling. Cholesterol can be produced *de novo* or absorbed from dietary

sources. Hypercholesterolemia, or high cholesterol, is a condition that is strongly correlated with heart disease, in which the combination of these two cholesterol sources is excessive. Accumulation of cholesterol in arterial walls results in atherosclerosis, a hardening of the arteries.

Cholesterol, shown in Figure 5.7, is a steroid of primary importance. Cholesterol is a major component of the phospholipid bilayer and is responsible for mediating membrane fluidity. Cholesterol, like a phospholipid, is an amphipathic molecule containing both hydrophilic and hydrophobic components. Interactions with both the hydrophobic tails and hydrophilic heads of phospholipids allows cholesterol to maintain relatively constant fluidity in cell membranes. At low temperatures, it keeps the cell membrane from solidifying; at high temperatures, it holds the membrane intact and prevents it from becoming too permeable. Cholesterol also serves as a precursor to many important molecules, including steroid hormones, bile acids, and vitamin D.

**Figure 5.7 Cholesterol**

Prostaglandins acquired their name because they were first thought to be produced by the prostate gland, but have since been determined to be produced by almost all cells in the body. These 20-carbon molecules are unsaturated carboxylic acids derived from arachidonic acid and contain one five-carbon ring. They act as paracrine or autocrine signaling molecules. In many tissues, the biological function of prostaglandins is to regulate the synthesis of cyclic adenosine monophosphate (cAMP), which is a ubiquitous intracellular messenger. In turn, cAMP mediates the actions of many other hormones. Downstream effects of prostaglandins include powerful effects on smooth muscle function, influence over the sleep-wake cycle, and the elevation of body temperature associated with fever and pain. Nonsteroidal anti-inflammatory drugs (NSAIDs) like aspirin inhibit the enzyme cyclooxygenase (COX), which aids in the production of prostaglandins.

A vitamin is an essential nutrient that cannot be adequately synthesized by the body and therefore must be consumed in the diet. Vitamins are commonly divided into water-soluble and lipid-soluble categories. Lipid-soluble vitamins can accumulate in stored fat, whereas excess water-soluble vitamins are excreted through the urine. The fat-soluble vitamins include A, D, E, and K. Each of these has important and varied functions. Vitamin A, or carotene, is an

unsaturated hydrocarbon that is important in vision, growth and development, and immune function. The most significant metabolite of vitamin A is the aldehyde form, retinal, which is a component of the light-sensing molecular system in the human eye. Retinol, the storage form of vitamin A, is also oxidized to retinoic acid, a hormone that regulates gene expression during epithelial development. Vitamin D, or cholecalciferol, can be consumed or formed in a UV light- driven reaction in the skin. In the liver and kidneys, vitamin D is converted to calcitriol (1,25-(OH)<sub>2</sub>D<sub>3</sub>), the biologically active form of vitamin D. Calcitriol increases calcium and phosphate uptake in the intestines, which promotes bone production. A lack of vitamin D can result in rickets, a condition seen in children and characterized by underdeveloped, curved long bones as well as impeded growth. One way to remember carotene is to remember that carrots are high in vitamin A, which is why eating carrots is colloquially suggested to improve vision. To remember that vitamin D regulates calcium, remember that it is frequently added to milk in order to aid in the absorption of calcium. Vitamin E characterizes a group of closely related lipids called tocopherols and tocotrienols. These are characterized by a substituted aromatic ring with a long isoprenoid side chain and are characteristically hydrophobic. Tocopherols are biological antioxidants. The aromatic ring reacts with free radicals, destroying them. This, in turn, prevents oxidative damage, an important contributor to the development of cancer and aging. Vitamin K is for Koagulation. Vitamin K is actually a group of compounds, including phyloquinone (K<sub>1</sub>) and the menaquinones (K<sub>2</sub>). Vitamin K is vital to the posttranslational modifications required to form prothrombin, an important clotting factor in the blood. The aromatic ring of vitamin K undergoes a cycle of oxidation and reduction during the formation of prothrombin. Vitamin K is also required to introduce calcium-binding sites on several calcium-dependent proteins. The anticoagulant warfarin works by blocking the recycling of vitamin K, causing a deficiency or lowering of the active amount of vitamin K. Therefore, patients taking warfarin are recommended to stay away from food containing high amounts of vitamin K, such as green leafy vegetables. MCAT CONCEPT CHECK 5.2 Before you move on, assess your understanding of the material with these questions. 1. How many carbons are in a



diterpene? 2. What is the difference between a steroid and a steroid hormone? 3. NSAIDs block prostaglandin production in order to reduce pain and inflammation. What do prostaglandins do to bring about these symptoms? 4. What are the names and functions of the four fat-soluble vitamins? 5.3 Energy Storage After Chapter 5.3, you will be able to: Explain why energy is more optimally stored as fat than as sugar Recall the structure and function of triacylglycerols Predict the products of saponification reactions: Triacylglycerols are a class of lipids specifically used for energy storage. From the body's point of view, lipids in general are a fantastic way to store energy. This is true for two major reasons. First, the carbon atoms of fatty acids are more reduced than those of sugars, which contain numerous alcohol groups. The result of this is that the oxidation of triacylglycerols yields twice the amount of energy per gram as carbohydrates, making this a far more energy-dense storage mechanism compared to polysaccharides like glycogen. Second, triacylglycerols are hydrophobic. They do not draw in water and do not require hydration for stability. This helps decrease their weight, especially in comparison to hydrophilic polysaccharides. One final perk for vertebrates surviving in colder temperatures (like penguins, polar bears, and arctic explorers) is that the layer of lipids serves a dual purpose of energy storage and insulation—it helps to retain body heat so that less energy is required to maintain a constant internal temperature. Triacylglycerols, also called triglycerides, are composed of three fatty acids bonded by ester linkages to glycerol, as shown in Figure 5.8. For most naturally occurring triacylglycerols, it is rare for all three fatty acids to be the Figure 5.8 Triacylglycerol Structure The fatty acids used here are palmitic acid, oleic acid, and  $\alpha$ -linolenic acid. Overall, these compounds are nonpolar and hydrophobic. This contributes to their insolubility in water, as the polar hydroxyl groups of the glycerol component and the polar carboxylates of fatty acids are bonded together, decreasing their polarity. The two main methods of energy storage in the body are as triacylglycerols in adipose tissue or as carbohydrates in glycogen. Each method has its advantages and disadvantages. For example, glycogen offers access to metabolic energy in a faster water-soluble form; however, because of its low energy density, glycogen can only provide energy

for a bit less than one day. In contrast, an individual who is moderately obese with 15 to 20 kg of stored triacylglycerols in adipocytes could draw upon fat stores for months, but it takes more time to mobilize this energy. Triacylglycerol deposits can be observed in cells as oily droplets in the cytosol. These serve as depots of metabolic fuel that can be recruited when the cell needs additional energy to divide or survive when other fuel supplies are low. Special cells in animals, known as adipocytes, store large amounts of fat and are found primarily under the skin, around mammary glands, and in the abdominal cavity. In plants, triacylglycerol deposits are also found in seeds as oils. Triacylglycerols travel bidirectionally in the bloodstream between the liver and adipose tissue. The physical characteristics of triacylglycerols are primarily determined by the saturation (or unsaturation) of the fatty acid chains that make them up, much like phospholipids.

**Free Fatty Acids and Saponification**

Free fatty acids are unesterified fatty acids with a free carboxylate group. In the body, these circulate in the blood bonded noncovalently to serum albumin. Fatty acids also make up what we know as soap, which can be produced through a process called saponification. Saponification is the ester hydrolysis of triacylglycerols using a strong base. Traditionally, the base that is used is lye, the common name for sodium or potassium hydroxide. The result is the basic cleavage of the fatty acid, leaving the sodium salt of the fatty acid and glycerol, as shown in Figure 5.9. The fatty acid salt is what we know as soap.

**Figure 5.9 Saponification**

Ester hydrolysis of a triacylglycerol using lye (NaOH)

Soaps can act as surfactants. A surfactant lowers the surface tension at the surface of a liquid, serving as a detergent or emulsifier. This is important to how soap works. If we try to combine an aqueous solution and oil, as with vinegar and olive oil in salad dressing, these solutions will remain in separate phases. If we were to add a soap, however, the two phases would appear to combine into a single phase, forming a colloid. This occurs because of the formation of micelles: tiny aggregates of soap with the hydrophobic tails turned inward and the hydrophilic heads turned outward, thereby shielding the hydrophobic lipid tails and allowing for overall solvation, as shown in Figure 5.10. We saw these earlier when we discussed

**Figure 5.10 Cross-Section of a Micelle**

Micelles organize in aqueous solution by

forcing hydrophobic tails to the interior, allowing the hydrophilic heads to interact with water in the environment. Saponification also occurs naturally, although more slowly, in corpses and oil paintings, as the triacylglycerols are hydrolyzed by naturally occurring bases. In corpses, the result of this process is known as adipocere, or grave wax.

**BIOCHEMISTRY GUIDED EXAMPLE WITH EXPERT**

Sugar-based fatty acid esters usually belong to the class of non-ionic surfactants and possess desirable characteristics suitable for different applications. They consist of a sugar moiety that acts as a hydrophilic (polar) head linked via an ester bond to a fatty acid chain that acts as a hydrophobic (nonpolar) tail. There is increasing interest in developing advanced drug delivery systems using these esters, including enhancement of skin penetration and

**Topic:** a fatty acid ester with a sugar as the polar head group

**Why these matter:** possible usage in drug delivery through transmucosal permeability. This study aimed to investigate the relationship between the structure and activity of a series of lactose ester derivatives, enzymatically synthesized using saturated fatty acids with different chain lengths (C10–caprate; C12–laurate; C14–myristate;

**Purpose:** to examine how the structure of a lactose fatty ester affects its activity

Solutions of each surfactant in water were prepared at varying concentrations and the surface tension was measured using a K100- Krüss force tensiometer with a platinum cylindrical rod probe of wetted length 1.6 mm at room temperature. The results are plotted in Figure 1 below. To examine the effect of lactose surfactants on the variation of mitochondrial membrane potential, the ratiometric dye JC-1 assay was employed. The JC-1 dye readily permeates across the cell plasma membrane where it specifically accumulates in active mitochondria, in a potential-dependent way. When present in the mitochondria, the dye forms J-aggregates, which emit fluorescence at a wavelength distinct from the wavelength the dye presents in the cytoplasm, where it remains in monomeric form. Mitochondrial depolarization, due to the dissipation of negative charges across the mitochondrial membrane because of mitochondrial disruption, is indicated by a decrease in the J-aggregate/monomer intensity ratio, thus representing an arbitrary value for mitochondrial membrane potential. The effect of different concentrations of lactose

surfactants on the mitochondrial membrane potential is reported below (Figure 2). They measured the surface tension of the and plotted it in Fig 1 was measured in the presence of the A decrease in ratio indicates that the mitochondria has IVs: type of surfactant; x-axis is a DV: surface tension Trend: all lines are a curve; the greater the number of carbons, the lower the required to decrease IVs: type of surfactant; x-axis is Trend: lines seem roughly negative S-shaped; the greater the number of carbons, the lower required to decrease Adapted from Lucarini, S., Fagioli, L., Cavanagh, R., Liang, W., Perinelli, D. R., Campana, M., Stolnik, S., ... Duranti, A. (2018). Synthesis, structure-activity relationships and in vitro toxicity profile of lactose-based fatty acid monoesters as possible drug permeability enhancers. If the researchers were to examine cell viability in future experiments, which of the four surfactants would be expected to be the most cytotoxic? The question asks us to predict the outcome of a future experiment, which indicates that we need to understand the results of the current experiment in order to predict future events. In the first paragraph, we see that the purpose of the passage is to discuss how these surfactants work as a function of the number of carbons attached to the sugar head group. From our outside knowledge we want to recall that surfactants have polar head groups, fatty acid tails, and often form micelles, allowing for nonpolar compounds (like many drugs!) to dissolve in the hydrophobic interior, while the surface-exposed portion of the micelle is water-soluble. Since the question specifically asks about the cytotoxic effects of the surfactants, we can mostly ignore Figure 1, as information about surface tension would not tell us if the surfactant was cytotoxic. Quickly assessing whether or not a figure is useful is an important skill for Test Day: not all of the figures will be valuable in answering every question. The measured variable in Figure 2 is the J-aggregate/monomer ratio, and the passage tells us that a drop in this ratio indicates that the potential across the mitochondrial membrane has been disrupted. We know from our content background that a proton gradient must be built across the inner mitochondrial membrane in order for ATP to be synthesized, and without that proton gradient the cell will quickly die due to a lack of energy. It's possible that the amphiphilic nature of the surfactant is "poking" holes

into the inner mitochondrial membrane, allowing for the proton gradient to dissipate without moving through ATP synthase. Figure 2 shows that increasing carbon number in the fatty acid tail corresponds with decreasing concentration required to dissipate the mitochondrial potential. Thus, we can predict that a longer fatty acid tail will be linked with greater cytotoxic activity. Specifically, we would expect lactose palmitate to be the most cytotoxic of the four surfactants studied in the current experiment. Nonpolar compounds can dissolve in the hydrophobic interior of the water-soluble micelle, meaning that our cleaning agents can dissolve both water-soluble and water-insoluble messes and then wash them all away together. Micelles are also important in the body for the absorption of fat-soluble vitamins (A, D, E, and K) and complicated lipids such as lecithins. Fatty acids and bile salts secreted by the gallbladder form micelles that can increase the surface area available for lipolytic enzymes.

MCAT CONCEPT CHECK 5.3 Before you move on, assess your understanding of the material with these questions. 1. How does the human body store spare energy? Why doesn't the human body store most energy as sugar? 2. Describe the structure and function of triacylglycerols. 3. What bonds are broken during saponification? 4. Why does soap appear to dissolve in water, and how is this fact important to

In this chapter, we examined the myriad biological functions performed by lipids. We first learned the structural functions of lipids, looking at the phospholipids that are the primary component of the phospholipid bilayer and other membrane lipids. Making our way through terpenes, we looked at the structure and function of signaling lipids, examining steroid hormones in particular. We looked into the fat-soluble vitamins and their downstream functions in the body. Finally, we summarized energy storage in the form of triacylglycerols and applied our acid-base chemistry knowledge to the formation of soap. In the next chapter, we turn our attention to the final class of biomolecules: nucleic acids. You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources! Lipids are insoluble in water and soluble in nonpolar organic solvents. Phospholipids are amphipathic and form the bilayer of biological membranes. They contain a hydrophilic (polar) head group and

hydrophobic The head group is attached by a phosphodiester linkage and, because it interacts with the environment, determines the function of the phospholipid. The saturation of the fatty acid tails determines the fluidity of the membrane; saturated fatty acids are less fluid than unsaturated ones. Fatty acids form most of the structural thickness of the

Glycerophospholipids are phospholipids that contain a glycerol Sphingolipids contain a sphingosine or sphingoid backbone. Many (but not all) sphingolipids are also phospholipids, containing a phosphodiester bond; these are termed sphingophospholipids. Sphingomyelins are the major class of sphingophospholipids and contain a phosphatidylcholine or phosphatidylethanolamine head group. They are a major component of the myelin sheath. Glycosphingolipids are attached to sugar moieties instead of a phosphate group. Cerebrosides have one sugar connected to sphingosine; globosides have two or more. Gangliosides contain oligosaccharides with at least one terminal N-acetylneuraminic acid (NANA; also called sialic acid). Waxes contain long-chain fatty acids esterified to long-chain alcohols. They are used as protection against evaporation and parasites in plants Terpenes are odiferous steroid precursors made from isoprene, a five- One terpene unit (a monoterpene) contains two isoprene units. Terpenoids are derived from terpenes via oxygenation or backbone rearrangement. They have similar odorous characteristics. Steroids contain three cyclohexane rings and one cyclopentane ring. Their oxidation state and functional groups may vary. Steroid hormones have high-affinity receptors, work at low concentrations, and affect gene expression and metabolism. Cholesterol is a steroid important to membrane fluidity and stability; it serves as a precursor to a host of other molecules. Prostaglandins are autocrine and paracrine signaling molecules that regulate cAMP levels. They have powerful effects on smooth muscle contraction, body temperature, the sleep-wake cycle, fever, and pain. The fat-soluble vitamins include vitamins A, D, E, and K. Vitamin A (carotene) is metabolized to retinal for vision and retinoic acid for gene expression in epithelial development. Vitamin D (cholecalciferol) is metabolized to calcitriol in the kidneys and regulates calcium and phosphorus homeostasis in the intestines (increasing calcium and phosphate absorption),

promoting bone formation. A deficiency of vitamin D causes Vitamin E (tocopherols) act as biological antioxidants. Their aromatic rings destroy free radicals, preventing oxidative damage. Vitamin K (phylloquinone and menaquinones) is important for formation of prothrombin, a clotting factor. It performs posttranslational modifications on a number of proteins, creating Triacylglycerols (triglycerides) are the preferred method of storing energy for long-term use. They contain one glycerol attached to three fatty acids by ester bonds. The fatty acids usually vary within the same triacylglycerol. The carbon atoms in lipids are more reduced than carbohydrates, giving twice as much energy per gram during oxidation. Triacylglycerols are very hydrophobic, so they are not hydrated by body water and do not carry additional water weight. Animal cells specifically used for storage of large triacylglycerol deposits are called adipocytes. Free fatty acids are unesterified fatty acids that travel in the bloodstream. Salts of free fatty acids are soaps and can be synthesized Saponification is the ester hydrolysis of triacylglycerols using a strong base, like sodium or potassium hydroxide. Soaps act as surfactants, forming micelles. A micelle can dissolve a lipid-soluble molecule in its fatty acid core, and washes away with water because of its shell of carboxylate head groups.

Answers to Concept Checks 1. Membrane lipids are amphipathic: they have hydrophilic heads and hydrophobic tails, allowing for the formation of bilayers in aqueous solution. The fatty acid tails form the bulk of the phospholipid bilayer, and play a predominantly structural role. On the other hand, the functional differences between membrane lipids are determined by the polar head group, due to its constant exposure to the exterior environment of the phospholipid bilayer (remember, this can be either the inside or outside of the cell). The degree of unsaturation of fatty acid tails can also play a small role in function. 2. The difference is the bond between the sphingosine backbone and the head group. When this is a phosphodiester bond, it's a phospholipid (note the phospho- prefixes). Nonphospholipid sphingolipids include glycolipids, which contain a glycosidic linkage to a sugar. Sugars (mono- or polysaccharide) Oligosaccharides and N-acetylneuraminic acid 4. In a nonpolar solvent, we would see the opposite of what happens in a polar solvent like water: the hydrophilic, polar

part of the molecules would be sequestered inside, while the nonpolar, hydrophobic part of the molecules would be found on the exterior and exposed to the 1. A diterpene has 20 carbon molecules in its backbone. One terpene unit is made from two isoprene units, each of which has five carbons. 2. A steroid is defined by its structure: it includes three cyclohexane rings and a cyclopentane ring. A steroid hormone is a molecule within this class that also functions as a hormone, meaning that it travels in the bloodstream, is active at low concentrations, has high-affinity receptors, and affects gene expression and metabolism. 3. Prostaglandins regulate the synthesis of cAMP, which is involved in many pathways, including those that drive pain and inflammation. As retinal: vision; as retinoic acid: epithelial development As calcitriol: calcium and phosphate regulation Antioxidants, using aromatic ring K (phyloquinone and Posttranslational modification of prothrombin, addition of calcium-binding sites on many proteins 1. The human body stores energy as glycogen and triacylglycerols. Triacylglycerols are preferred because their carbons are more reduced, resulting in a larger amount of energy yield per unit weight. In addition, due to their hydrophobic nature, triacylglycerols do not need to carry extra weight from hydration. 2. Triacylglycerols, also called triglycerides, are composed of a glycerol backbone esterified to three fatty acids. They are used for energy 3. The ester bonds of triacylglycerols are broken to form a glycerol molecule and the salts of fatty acids (soap). 4. Soap appears to dissolve in water because amphipathic free fatty acid salts form micelles, with hydrophobic fatty acid tails toward the center and carboxylate groups facing outward toward the water. Fat-soluble particles can then dissolve inside micelles in the soap-water solution and wash away. Water-soluble compounds can freely dissolve in the Science Mastery Assessment Glycolipids contain sugar moieties connected to their backbone. Sphingomyelin is not a glycolipid, but rather a phospholipid. This class can either have phosphatidylcholine or phosphatidylethanolamine as a head group and therefore contains a phosphodiester, not glycosidic, bond. Saponification is the ester hydrolysis of triacylglycerol using a strong base like sodium or potassium hydroxide to form glycerol and fatty acid salts. This is not a



condensation reaction, as in (A), but a cleavage reaction. Fatty acids do travel in the body bonded to serum albumin, as in (D), but that is unrelated to the process of saponification. The basic backbone of steroid structure contains three cyclohexane rings and one cyclopentane ring. Although the oxidation status of these rings varies for different steroids, the overall structure does not, as in (C). Fatty acid salt micelles are responsible for the formation of soap bubbles. While phospholipids can form bilayers, as in (C), the fatty acids in soap are free fatty acids, not phospholipids. Steroid hormones are produced in endocrine glands and travel in the bloodstream to bind high-affinity receptors in the nucleus. The hormone's receptor binds to DNA as part of the hormone-receptor complex, but the hormone itself does not. Triacylglycerols are highly hydrophobic and therefore not highly hydrated (which would add extra weight from the water of hydration, taking away from the energy density of these molecules), eliminating (A). The fatty acid chains produce twice as much energy as polysaccharides during oxidation because they are highly reduced. The fatty acid chains vary in length and Vitamin A is metabolized to retinal, which is important for sight. Vitamin D is metabolized to calcitriol, which is important for calcium regulation. Vitamin E is made up of tocopherols, which are biological antioxidants. Vitamin K is necessary for the introduction of calcium binding sites, such as during the posttranslational modification of prothrombin. Phospholipids are amphipathic, as are fatty acid salts. Although amphipathic molecules take spherical forms with hydrophobic molecules interior in aqueous solution, as in (A), the opposite would be true in a nonpolar solvent. (B) describes phospholipids and sphingolipids, and (D) describes triacylglycerols and phospholipids; both groups do not include fatty acid. Sphingolipids can either have a phosphodiester bond, and therefore be phospholipids, or have a glycosidic linkage and therefore be glycolipids. Not all sphingolipids have a sphingosine backbone, as in statement II; some have related (sphingoid) compounds as backbones instead. More saturated fatty acids make for a less fluid solution. This is because they can pack more tightly and form more noncovalent bonds, resulting in more energy being needed to disrupt the overall structure. Glycerophospholipids are a subset of phospholipids,

as are sphingomyelins. Glycerophospholipids are never sphingolipids because they contain a glycerol backbone (rather than sphingosine or a sphingoid backbone), eliminating (A). Sphingolipids are used in the ABO blood typing system, eliminating (C). Glycerophospholipids have a polar head group, glycerol, and two fatty acid tails, not one, as in (D). A triterpene is made of six isoprene moieties (remember, one terpene unit contains two isoprene units), and therefore has a 30-carbon backbone. Cholesterol is a steroid hormone precursor that has variable effects on membrane fluidity depending on temperature, eliminating (A). It interacts with both the hydrophobic tails and the hydrophilic heads of membrane lipids, nullifying (D). It is also a precursor for vitamin D (not vitamin A), which can be produced in the skin in a UV-driven reaction, eliminating (C). Prostaglandins are paracrine or autocrine signaling molecules, not endocrine—they affect regions close to where they are produced, rather than affecting the entire body. Think of the swelling that happens when you bash your knee into your desk: your knee will swell, become discolored, and possibly bruise. Luckily, however, your entire body won't swell as well. Waxes are also produced in animals for similar protective functions. Cerumen, or earwax, is a prime example in humans. Consult your online resources for additional practice.

Biochemistry Chapter 2 Biochemistry Chapter 8 Biochemistry Chapter 11 Lipid and Amino Acid Metabolism Biology Chapter 5 The Endocrine System Biology Chapter 9 The Digestive System Organic Chemistry Chapter 8 DNA and Biotechnology

Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate.

How to Use This Assessment If you answer 0–7

questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one. If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect. If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. In a single strand of a nucleic acid, nucleotides are linked by: A. hydrogen bonds. B. phosphodiester bonds. C. ionic bonds. D. van der Waals forces.
2. Which of the following statements regarding differences between DNA and RNA is FALSE? A. In cells, DNA is double-stranded, whereas RNA is single- B. DNA uses the nitrogenous base thymine; RNA uses uracil. C. The sugar in DNA is deoxyribose; the sugar in RNA is ribose. D. DNA strands replicate in a 5' to 3' direction, whereas RNA is synthesized in a 3' to 5' direction.
3. Which of the following DNA sequences would have the highest
4. Which of the following biomolecules is LEAST likely to contain an
5. For a compound to be aromatic, all of the following must be true A. the molecule is cyclic. B. the molecule contains  $4n + 2 \pi$  electrons. C. the molecule contains alternating single and double bonds. D. the molecule is planar.
6. Which of the following enzymes is NOT involved in DNA B. DNA ligase C. RNA polymerase I
7. How is cDNA best characterized? A. cDNA results from a DNA transcript with noncoding regions B. cDNA results from the reverse transcription of processed C. cDNA is the abbreviation for deoxycytosine. D. cDNA is the circular DNA molecule that forms the bacterial
8. Which of the following statements regarding polymerase chain reaction is FALSE? A. Human DNA polymerase is used because it is the most B. A primer must be prepared with a complementary sequence to part of the DNA of interest. C. Repeated heating

and cooling cycles allow the enzymes to act specifically and replaces helicase. D. Each cycle of the polymerase chain reaction doubles the amount of DNA of interest.

9. Endonucleases are used for which of the following? I. Gene therapy II. Southern blotting III. DNA repair A. I only B. II only C. II and III only D. I, II, and III

10. How does prokaryotic DNA differ from eukaryotic DNA? I. Prokaryotic DNA lacks nucleosomes. II. Eukaryotic DNA has telomeres. III. Prokaryotic DNA is replicated by a different DNA polymerase. IV. Eukaryotic DNA is circular when not restricted by centromeres. A. I only B. IV only C. II and III only D. I, II, and III

11. Why might uracil be excluded from DNA but NOT RNA? A. Uracil is much more difficult to synthesize than thymine. B. Uracil binds adenine too strongly for replication. C. Cytosine degradation results in uracil. D. Uracil is used as a DNA synthesis activator.

12. Tumor suppressor genes are most likely to result in cancer A. loss of function mutations. B. gain of function mutations. C. proto-oncogene formation. D. proto-oncogene formation.

13. Which of the following is an ethical concern of gene sequencing? A. Gene sequencing is invasive, thus the potential health risks must be thoroughly explained. B. Gene sequencing impacts relatives, thus privacy concerns may be raised. C. Gene sequencing is very inaccurate, which increases anxiety related to findings. D. Gene sequencing can provide false-negative results, giving a false sense of security.

14. Which of the following is NOT a difference between heterochromatin and euchromatin? A. Euchromatin has areas that can be transcribed, whereas heterochromatin is silent. B. Heterochromatin is tightly packed, whereas euchromatin is C. Heterochromatin stains darkly, whereas euchromatin stains D. Heterochromatin is found in the nucleus, whereas euchromatin is in the cytoplasm.

15. During which phase of the cell cycle are DNA repair mechanisms

DNA and Biotechnology In This Chapter

6.1 DNA Structure Nucleosides and Nucleotides Purines and Pyrimidines Denaturation and Reannealing

6.2 Eukaryotic Chromosome Organization Heterochromatin and Euchromatin Telomeres and Centromeres

6.3 DNA Replication Strand Separation and Origins of Replication Synthesis of Daughter Strands Replicating the Ends of Chromosomes

6.4 DNA Repair Oncogenes and Tumor Suppressor Genes Proofreading and Mismatch Repair Nucleotide and Base Excision Repair

6.5

Recombinant DNA and Biotechnology DNA Cloning and Restriction Enzymes DNA Libraries and cDNA Applications of DNA Technology Safety and Ethics The content in this chapter should be relevant to about 14% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories: 1B: Transmission of genetic information from the gene to the protein 5D: Structure, function, and reactivity of biologically-relevant molecules How do all of the cells of our body know what job to do? The cells that make up the human body have nucleic acids that instruct the cell on how to function. The nucleic acid deoxyribonucleic acid (DNA) stores the information in our cells and selectively shares that information when appropriate. DNA is a molecule that can be passed from generation to generation. DNA can be replicated in a carefully regulated process designed to keep the genome safe from degradation and free from errors. Seemingly small changes in the genetic code can result in life-threatening and even life- incompatible alterations to protein structure and function. In this chapter, the unique structure of DNA will be discussed, along with replication and repair processes. The primary focus will be on eukaryotic processes, but there will be some review of prokaryotic genetics to help us better understand the molecular basis of life. Much of the advancement of medicine in the past two decades has been due to our increased understanding of molecular genetics, which has led to the creation of an entire biotechnology industry centered around genomics and the utilization of nucleic acids for various diagnostic tests and therapeutic interventions. We will also take a look at some of these important principles in this chapter.

### 6.1 DNA Structure

After Chapter 6.1, you will be able to:

- Identify the structures of, and distinguish the differences between, nucleotides and
- Recognize the key features and rules of purine and pyrimidine structure and pairing

Recall the structural differences between DNA and RNA molecules There are two chemically distinct forms of nucleic acids within eukaryotic cells. Deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) are polymers, each with distinct roles, that together create the molecules integral to life in all living organisms. DNA is the focus of this chapter and RNA will be discussed in more detail in Chapter 7 of MCAT Biochemistry Review. The bulk of DNA is found in chromosomes in

the nucleus of eukaryotic cells, although some is also present in mitochondria and

**Nucleosides and Nucleotides** DNA is a macromolecule and it is essential to understand how this molecule is constructed. DNA is a polydeoxyribonucleotide that is composed of many monodeoxyribonucleotides linked together. The nomenclature of nucleic acids can be complicated, so the terms have been defined here: Nucleosides are composed of a five-carbon sugar (pentose) bonded to a nitrogenous base and are formed by covalently linking the base to C-1' of the sugar, as shown in Figure 6.1. Note that the carbon atoms in the sugar are labeled with a prime symbol to distinguish them from the carbon atoms in the nitrogenous base.

**Figure 6.1 Examples of Nucleosides** Nucleotides are formed when one or more phosphate groups are attached to C-5' of a nucleoside. Often these molecules are named according to the number of phosphates present. Adenosine di- and triphosphate (ADP and ATP), for example, gain their names from the number of phosphate groups attached to the nucleoside adenosine. These are high-energy compounds because of the energy associated with the repulsion between closely associated negative charges on the phosphate groups, as shown in Figure 6.2.

**Nucleotides are the building blocks of DNA.** **Figure 6.2 High-Energy Bonds in Adenosine Triphosphate, a Nucleotide** In Chapter 3 of MCAT General Chemistry Review, we learned that bond breaking is usually endothermic and bond making is usually exothermic. ATP offers a biologically relevant—and MCAT tested—exception to this rule. Due to all the negative charges in close proximity, removing the terminal phosphate from ATP actually releases energy, which powers our

**Nucleic acids are classified according to the pentose they contain, as shown in Figure 6.3.** If the pentose is ribose, the nucleic acid is RNA; if the pentose is deoxyribose (ribose with the 2' OH group replaced by H), then it is

**Figure 6.3 Ribose and Deoxyribose** Ribose has an OH group at C-2; deoxyribose has an H. The nomenclature for the common bases, nucleosides, and nucleotides is shown in Table 6.1. Note that there is no thymidine listed (only deoxythymidine) because thymine appears almost exclusively in DNA.

**Table 6.1 Nomenclature of Important Bases, Nucleosides, and Nucleotides** Names of nucleosides and nucleotides attached to deoxyribose are shown in parentheses. The

backbone of DNA is composed of alternating sugar and phosphate groups; it determines the directionality of the DNA and is always read from 5' to 3'. It is formed as nucleotides are joined by 3'-5' phosphodiester bonds. That is, a phosphate group links the 3' carbon of one sugar to the 5' phosphate group of the next incoming sugar in the chain. Phosphates carry a negative charge; thus, DNA and RNA strands have an overall negative charge. Each strand of DNA has distinct 5' and 3' ends, creating polarity within the backbone, as shown in Figure 6.4. The 5' end of DNA, for instance, will have a phosphate group bonded to C-5' of the sugar, while the 3' end has a free OH on C-3' of the sugar. The base sequence of a nucleic acid strand is both written and read in the 5' to 3' direction. Thus, the DNA strand in Figure 6.4 must be written: 5'—ATG—3' (or simply ATG). DNA sequences can also be written in slightly different ways: Figure 6.4 DNA Strand Polarity DNA strands run antiparallel to one another; enzymes that replicate and transcribe DNA only work in the 5' to 3' direction. If written backwards, the ends must be labeled: 3'—GTA—5' The position of phosphates may be shown: pApTpG "d" may be used as shorthand for deoxyribose: dAdTdG On the MCAT, always check nucleic acids for polarity. One of the easiest ways to generate incorrect answers is to simply reverse the reading frame: 3'—GATTACA—5' is not the same DNA is generally double-stranded (dsDNA) and RNA is generally single-stranded (ssRNA). Exceptions to this rule may be seen, especially in viruses, as described in Chapter 1 of MCAT Biology Review. Purines and Pyrimidines There are two families of nitrogen-containing bases found in nucleotides: purines and pyrimidines. The bases described below, and shown in Figure 6.5, represent the common bases in eukaryotes; however, it should be noted that exceptions may be seen in tRNA and in some prokaryotes and viruses. Purines contain two rings in their structure. The two purines found in nucleic acids are adenine (A) and guanine (G); both are found in DNA and RNA. Pyrimidines contain only one ring in their structure. The three pyrimidines are cytosine (C), thymine (T), and uracil (U); while cytosine is found in both DNA and RNA, thymine is only found in DNA and uracil is only found in RNA. Figure 6.5 Bases Commonly Found in Nucleic Acids To remember the types and structures of these two classes of nitrogenous bases, remember to CUT the PYe

(as C, U, and T are pyrimidines). You can also note that pie has one ring of crust, and pyrimidines have only one ring in their structure. You can also remember P<sub>U</sub>R<sub>E</sub> A<sub>S</sub> G<sub>O</sub>L<sub>D</sub> (as A and G are purines); think of gold wedding rings. It takes two gold rings at a wedding, just like purines have two rings in their structure. Purines and pyrimidines are examples of biological aromatic heterocycles. In chemistry, the term aromatic describes any unusually stable ring system that adheres to the following four specific rules: 1. The compound is cyclic. 2. The compound is planar. 3. The compound is conjugated (has alternating single and multiple bonds, or lone pairs, creating at least one unhybridized p-orbital for each atom in the ring). 4. The compound has  $4n + 2$  (where  $n$  is any integer)  $\pi$  electrons. This is called Hückel's rule. The most common example of an aromatic compound is benzene, but many different structures obey these rules. In an aromatic compound, the extra stability is due to the delocalized  $\pi$  electrons, which can travel throughout the entire compound using available molecular orbitals. All six of the carbon atoms in benzene are  $sp^2$ -hybridized, and each of the six orbitals overlaps equally with its two neighbors. As a result, the delocalized electrons form two  $\pi$  electron clouds (one above and one below the plane of the ring), as shown in Figure 6.6. This delocalization is characteristic of all aromatic molecules, and because of this, aromatic molecules are fairly unreactive. Figure 6.6 Delocalization of  $\pi$  Electrons in Benzene

Heterocycles are ring structures that contain at least two different elements in the ring. As shown in Figure 6.5 earlier, both purines and pyrimidines contain nitrogen in their aromatic rings. Nucleic acids are thus imbued with exceptional stability. This helps to explain the utility of nucleotides as the molecule for storing genetic information. Putting this information together, we can start looking at the Watson-Crick model of DNA structure. In 1953, James Watson and Francis Crick presented one of the landmark findings of modern biology and medicine: the three-dimensional structure of DNA. With X-ray patterns of DNA produced by Rosalind Franklin laying the necessary foundation for their work, Watson and Crick were able to deduce the double-helical nature of DNA and propose specific base-pairing that would be the basis of a copying mechanism. In the double helix, two linear polynucleotide chains of



DNA are wound together in a spiral orientation along a common axis. The key features of the model—some of which have already been mentioned—are: The two strands of DNA are antiparallel; that is, the strands are oriented in opposite directions. When one strand has polarity 5' to 3' down the page, the other strand has 5' to 3' polarity up the page. The sugar-phosphate backbone is on the outside of the helix with the nitrogenous bases on the inside. There are specific base-pairing rules, often referred to as complementary base-pairing, as shown in Figure 6.7. An adenine (A) is always base-paired with a thymine (T) via two hydrogen bonds. A guanine (G) always pairs with cytosine (C) via three hydrogen bonds. The three hydrogen bonds make the G-C base pair interaction stronger. These hydrogen bonds, and the hydrophobic interactions between bases, provide stability to the double helix structure. Thus, the base sequence on one strand defines the base sequence on the other strand.

**Base-Pairing in DNA** Because of the specific base-pairing, the amount of A equals the amount of T, and the amount of G equals the amount of C. Thus, total purines will be equal to total pyrimidines overall. These properties are known as Chargaff's rules. When writing a complementary strand of DNA, it is important to not only remember the base-pairing rules but to also keep track of the 5' and 3' ends. Remember that the sequences need to be both complementary and antiparallel. For example, 5'—ATCG—3' will be complementary to 3'—CGAT—5'. Using Chargaff's rules: In double-stranded DNA, purines = pyrimidines: %A = %T %G = %C If a sample of DNA has 10% G, what is the % of T? 10% G = 10% C, thus %G + %C = 20% %A + %T = 80%, thus %T = 40%.

The double helix of most DNA is a right-handed helix, forming what is called B-DNA, as shown in Figure 6.8. The helix in B-DNA makes a turn every 3.4 nm and contains about 10 bases within that span. Major and minor grooves can be identified between the interlocking strands and are often the site of protein binding. Another form of DNA is called Z-DNA for its zigzag appearance; it is a left-handed helix that has a turn every 4.6 nm and contains 12 bases within each turn. A high GC-content or a high salt concentration may contribute to the formation of this form of DNA. No biological activity has been attributed to Z-DNA partly because it is unstable and difficult to research. Figure 6.8 The

B-DNA Double Helix Denaturation and Reannealing During processes such as replication and transcription, it is necessary to gain access to the DNA. The double helical nature of DNA can be denatured by conditions that disrupt hydrogen bonding and base-pairing, resulting in the “melting” of the double helix into two single strands that have separated from each other. Notably, none of the covalent links between the nucleotides in the backbone of the DNA break during this process. Heat, alkaline pH, and chemicals like formaldehyde and urea are commonly used to denature. Denatured, single-stranded DNA can be reannealed (brought back together) if the denaturing condition is slowly removed. If a solution of heat- denatured DNA is slowly cooled, for example, then the two complementary strands can become paired again, as shown in Figure 6.9.

**Figure 6.9 Denaturation and Reannealing of DNA** Such annealing of complementary DNA strands is also an important step in many laboratory processes, such as polymerase chain reactions (PCR) and in the detection of specific DNA sequences. In these techniques, a well- characterized probe DNA (DNA with known sequence) is added to a mixture of target DNA sequences. When probe DNA binds to target DNA sequences, this may provide evidence of the presence of a gene of interest. This binding process is called hybridization and is described in further detail later in this chapter.

**MCAT CONCEPT CHECK 6.1** Before you move on, assess your understanding of the material with these questions. 1. What is the difference between a nucleoside and a nucleotide? 2. What are the base-pairing rules according to the Watson–Crick model? 3. What are the three major structural differences between DNA and RNA? 4. How does the aromaticity of purines and pyrimidines underscore their genetic 5. If a strand of RNA contained 15% cytosine, 15% adenine, 35% guanine, and 35% uracil, would this violate Chargaff's rules? Why or why not?

**6.2 Eukaryotic Chromosome Organization** After Chapter 6.2, you will be able to: Recall the names and the role of the five histone proteins Differentiate between the major characteristics of heterochromatin and euchromatin Describe the traits of telomeres and centromeres There are over 6 billion bases of DNA in each human cell. It is important for the cell to organize these bases effectively. These bases must be replicated during the cell cycle and also utilized in gene

expression for normal cellular functions. In humans, DNA is divided up among the 46 chromosomes found in the nucleus of the cell. The supercoiling of the DNA double helix does provide some compaction, but much more is necessary. The DNA that makes up a chromosome is wound around a group of small basic proteins called histones, forming chromatin. There are five histone proteins found in eukaryotic cells. Two copies each of the histone proteins H2A, H2B, H3, and H4 form a histone core and about 200 base pairs of DNA are wrapped around this protein complex, forming a nucleosome, as shown in Figure 6.10. Under an electron microscope, the nucleosomes look like beads on a string. The last histone, H1, seals off the DNA as it enters and leaves the nucleosome, adding stability to the structure. Together, the nucleosomes create a much more organized and compacted DNA.

**Figure 6.10 Nucleosome Structure** Nucleosomes are composed of DNA wrapped around histone proteins. Histones are one example of nucleoproteins (proteins that associate with DNA). Most other nucleoproteins are acid-soluble and tend to stimulate processes such as transcription.

**Heterochromatin and Euchromatin** The chromosomes have a diffuse configuration during interphase of the cell cycle. The cell will undergo DNA replication during the S phase of interphase and having the DNA uncondensed and accessible makes the process more efficient. A small percentage of the chromatin remains compacted during interphase and is referred to as heterochromatin. Heterochromatin appears dark under light microscopy and is transcriptionally silent. Heterochromatin often consists of DNA with highly repetitive sequences. In contrast, the dispersed chromatin is called euchromatin, which appears light under light microscopy. Euchromatin contains genetically active DNA. Both heterochromatin and euchromatin can be seen in the nucleus in Figure 6.11.

**Figure 6.11 Euchromatin and Heterochromatin in an Interphase Nucleus** Heterochromatin is dark, dense, and silent. Euchromatin is light, uncondensed, and

**Telomeres and Centromeres** As described later in this chapter, DNA replication cannot extend all the way to the end of a chromosome. This will result in losing sequences and information with each round of replication. The solution for our cells is a simple repeating unit (TTAGGG) at the end of the DNA, forming a telomere. Some of

the sequence is lost in each round of replication and can be replaced by the enzyme telomerase. Telomerase is more highly expressed in rapidly dividing cells. Animal studies indicate that there are a set number of replications possible, and that the progressive shortening of telomeres contributes to aging. Telomeres also serve a second function: their high GC- content creates exceptionally strong strand attractions at the end of chromosomes to prevent unraveling; think of telomeres as “knotting off” the end of the chromosome. Centromeres, as their name suggests, are a region of DNA found in the center of chromosomes. They are often referred to as sites of constriction because they form noticeable indentations. This part of the chromosome is composed of heterochromatin, which is in turn composed of tandem repeat sequences that also contain high GC-content. During cell division, the two sister chromatids can therefore remain connected at the centromere until microtubules separate the chromatids during anaphase.

**BIOCHEMISTRY GUIDED EXAMPLE WITH EXPERT**

Cisplatin is an effective chemotherapeutic agent against a number of cancers, including notoriously difficult to treat head and neck cancers. Cisplatin acts by binding DNA, which then irreversibly binds repair complexes, preventing effective repair. Cisplatin exhibits two major drawbacks that limit its application in cancer therapy—severe side effects and the rapid development of drug resistance. They are mutually connected, as adverse side effects restrict the administration of high doses, while underdosing leads to development of resistance in the cancerous cells. For this reason, drugs that sensitize cancer cells towards cisplatin could increase its therapeutic efficacy.

**Topic:** cisplatin is a drug used in inhibits DNA repair has bad side effects and cancer cells can

**Purpose:** looking for a drug that makes cancer cells more

Four groups of mice were transfected with tumor cells by an intraperitoneal injection; 24 hours later they received 5 mg/kg cisplatin, 166 mg/kg butyrate, both cisplatin and butyrate, or a sham treatment. The life span of the mice is noted below in Table 1 along with the T/C ratio, which

**First experiment:** the life span of cancerous mice were is the ratio between the mean life spans of the treated animals (T) and the controls (C). To further investigate the mechanism by which butyrate acts, exponentially growing HeLa cells were

treated with 5 mM butyrate, 8  $\mu$ M cisplatin, or both. At 4 and 24 hours after treatment, total histone fraction was isolated and equal quantities of histones were subjected to SDS-PAGE, and subsequently to western blot with anti-acetylated histone antibody. Acetylation is a post-translational modification added to lysine groups on histone proteins. The acetylation levels are expressed as a percentage of the untreated control in Figure 1 below.

how does butyrate act? The histone were measured with  $10.8 \pm 2.0$   $14.0 \pm 4.5$   $12.0 \pm 3.5$   $19.0 \pm 3.4$  DV: life span  
Trend: cisplatin + longer life span IVs: treatment, time Trend: butyrate and cisplatin + butyrate  
higher levels of acetylation after 24 Adapted from Koprinarova, M., Markovska, P., Iliev, I., Anachkova, B., & Russev, G. (2010). Sodium butyrate enhances the cytotoxic effect of cisplatin by abrogating the cisplatin imposed

Given the fact that histones are enriched with surface-exposed basic amino acids, how does butyrate enhance the cytotoxic effect of cisplatin on tumor cells? The question stem asks us to explain the action of butyrate in conjunction with cisplatin, which means we need to dig into the experiment and results of the passage. The first paragraph tells us that cisplatin blocks DNA repair, and when targeting cancerous cells, cisplatin would likely cause cell death. Table 1 clearly shows that cisplatin alone doesn't increase the life span of mice with cancer, but coupling cisplatin with butyrate does. However, this result doesn't tell us how this paired treatment works (just that it does work), which means that we need to find this information in Figure 1. The treatments do not differ from the control after 4 hours, but butyrate and cisplatin + butyrate do increase the levels of histone acetylation. The passage tells us that histone acetylation is a post-translational addition of an acetyl group on to lysines. We know from the structure of amino acids that lysines are positively charged, so adding an acetyl group would mask the positive charge. We're also told that histones have many surface- exposed basic amino acids, and basic amino acids (like lysine and arginine) are positively charged at physiological pH. Let's also recall that when DNA is wrapped tightly around histone proteins, it is referred to as heterochromatin, which means the DNA is transcriptionally silent. Since DNA has a negative charge due to the phosphodiester backbone, acetylating the lysines on histones will remove some of the positive charge.

Without that positive charge binding the negatively charged DNA, the histones will no longer be held tightly to the DNA, meaning they will dissociate from the DNA. DNA that is not tightly bound to histones forms euchromatin, which is genetically active: those genes can now be transcribed and translated. The DNA will then also be accessible to cisplatin, which will bind and stop DNA repair complexes. A build up of unrepaired DNA often causes cells to die, usually through apoptotic mechanisms. In summary, butyrate causes DNA to separate from histones, allowing for cisplatin to bind and stop DNA repair complexes from fixing errors in the DNA, leading to eventual cell death.

MCAT CONCEPT CHECK 6.2 Before you move on, assess your understanding of the material with these questions.

1. What are the five histone proteins in eukaryotic cells? Which one is not part of the histone core around which DNA wraps to form chromatin?
2. Compare and contrast heterochromatin and euchromatin based on the following:
  - Density of chromatin packing
  - Appearance under light microscopy
3. What property of telomeres and centromeres allows them to stay tightly raveled, even when the rest of DNA is uncondensed?

6.3 DNA Replication After Chapter 6.3, you will be able to:

- List the names and functions of the major enzymes of DNA synthesis in prokaryotes
- Differentiate between synthesis of the leading and lagging strands
- Explain the role of telomerase and the function of the telomere

The DNA is an organism's "blueprint" that provides not only the ability to sustain activities of life but also insight into our evolutionary past. The process of DNA replication is highly regulated to ensure as close to 100 percent perfection when making a copy of our genome as possible. DNA replication is necessary for the reproduction of a species and for any

Strand Separation and Origins of Replication The human genome has about 3 billion base pairs packed into multiple chromosomes. The replisome or replication complex is a set of specialized proteins that assist the DNA polymerases. To begin the process of replication, DNA unwinds at points called origins of replication. The generation of new DNA proceeds in both directions, creating replication forks on both sides of the origin, as shown in Figure 6.12.

Figure 6.12 Origins of Replication Replication forks form on both sides of the origin, increasing the efficiency of replication. The bacterial chromosome is a closed,

double-stranded circular DNA molecule with a single origin of replication. Thus, there are two replication forks that move away from each other in opposite directions around the circle. The two replication forks eventually meet, resulting in the production of two identical circular molecules of DNA. Eukaryotic replication must copy many more bases compared to prokaryotic and is a slower process. In order to duplicate all of the chromosomes efficiently, each eukaryotic chromosome contains one linear molecule of double-stranded DNA having multiple origins of replication. As the replication forks move toward each other and sister chromatids are created, the chromatids will remain connected at the centromere. The differences between prokaryotic and eukaryotic replication patterns are shown in Figure 6.13 DNA Replication in Prokaryotes and Eukaryotes

Any antibiotic ending with -floxacin (ciprofloxacin, moxifloxacin, and so on) is called a fluoroquinolone and targets the prokaryotic topoisomerase DNA gyrase. This stops bacterial replication and slows the infection. Fluoroquinolones are routinely used for pneumonia and certain infections of the genitourinary system. Helicase is the enzyme responsible for unwinding the DNA, generating two single-stranded template strands ahead of the polymerase. Once opened, the unpaired strands of DNA are very sticky, in a molecular sense. The free purines and pyrimidines seek out other molecules with which to hydrogen bond. Proteins are therefore required to hold the strands apart: single-stranded DNA-binding proteins will bind to the unraveled strand, preventing both the reassociation of the DNA strands and the degradation of DNA by nucleases. As the helicase unwinds the DNA, it will cause positive supercoiling that strains the DNA helix. Supercoiling is a wrapping of DNA on itself as its helical structure is pushed ever further toward the telomeres during replication; picture an old-fashioned telephone cord that's become tangled on itself. To alleviate this torsional stress and reduce the risk of strand breakage, DNA topoisomerases introduce negative supercoils. They do so by working ahead of helicase, nicking one or both strands, allowing relaxation of the torsional pressure, and then resealing the cut. During replication, these parental strands will serve as templates for the generation of new daughter strands. The replication process is termed semiconservative

because one parental strand is retained in each of the two resulting identical double-stranded DNA molecules, as shown in Figure 6.14 Semiconservative Replication. A new double helix is made of one old parent strand and one new daughter strand. Synthesis of Daughter Strands DNA polymerases are responsible for reading the DNA template, or parental strand, and synthesizing the new daughter strand. The DNA polymerase can read the template strand in a 3' to 5' direction while synthesizing the complementary strand in the 5' to 3' direction. This will result in a new double helix of DNA that has the required antiparallel orientation. Due to this directionality of the DNA polymerase, certain constraints arise. Remember that the two separated parental strands of the helix are also antiparallel to each other. Thus, at each replication fork, one strand is oriented in the correct direction for DNA polymerase; the other strand is not. With the exception of DNA polymerase's reading direction (and a few untested endonucleases), everything in molecular biology is 5' to 3'. DNA polymerase reads 3' to 5', but the following processes occur 5' to 3': RNA translation (reading of codons). The leading strand in each replication fork is the strand that is copied in a continuous fashion, in the same direction as the advancing replication fork. This parental strand will be read 3' to 5' and its complement will be synthesized in a 5' to 3' manner, as discussed above. The lagging strand is the strand that is copied in a direction opposite the direction of the replication fork. On this side of the replication fork, the parental strand has 5' to 3' polarity. DNA polymerase cannot simply read and synthesize on this strand. How does it solve this problem? Because DNA polymerase can only synthesize in the 5' to 3' direction from a 3' to 5' template, small strands called Okazaki fragments are produced. As the replication fork continues to move forward, it clears additional space that DNA polymerase must fill in. Each time DNA polymerase completes an Okazaki fragment, it turns around to find another gap that needs to be filled. The process of DNA replication is shown in Figure 6.15. The first step in the replication of DNA is actually to lay down an RNA primer. DNA cannot be synthesized de novo; that is, it needs another molecule to "hook on" to. RNA, on the other hand, can be directly paired with the parent strand. Thus, primase synthesizes a short primer (roughly 10 nucleotides) in the 5' to 3'



direction to start replication on each strand. These short RNA sequences are constantly being added to the lagging strand because each Okazaki fragment must start with a new primer. In contrast, the leading strand requires only one, in theory (in reality, there are usually a few primers on the leading strand). DNA polymerase III (prokaryotes) or DNA polymerases  $\alpha$ ,  $\delta$ , and  $\epsilon$  (eukaryotes) will then begin synthesizing the daughter strands of DNA in the 5' to 3' manner. The incoming nucleotides are 5' deoxyribonucleotide triphosphates: dATP, dCTP, dGTP, and dTTP. As the new phosphodiester bond is made, a free pyrophosphate (PPi) is released.

**Figure 6.15 Enzymes of DNA Replication** This process involves the action of DNA helicase, gyrase, polymerase, and ligase to create two identical molecules. The RNA must eventually be removed to maintain integrity of the genome. This is accomplished by the enzyme DNA polymerase I (prokaryotes) or RNase H (eukaryotes). Then, DNA polymerase I (prokaryotes) or DNA polymerase  $\delta$  (eukaryotes) adds DNA nucleotides where the RNA primer had been. DNA ligase seals the ends of the DNA molecules together, creating one continuous strand of DNA. While prokaryotic DNA synthesis has been worked out in great detail, and eukaryotic synthesis is considered to be very similar, there are a few differences in the enzymes involved. There are five "classic" DNA polymerases in eukaryotic cells, which are designated with the Greek letters  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ , and  $\epsilon$ . Further research has revealed more polymerases named  $\zeta$  through  $\mu$ , but these are outside the scope of the MCAT.

**Table 6.2** Steps and Proteins Involved in DNA Replication

Step in Replication	Protein(s)
Origin of replication	One per chromosome
Unwinding of DNA double helix	Stabilization of unwound template
Synthesis of RNA primers	Synthesis of DNA
	DNA polymerase III $\alpha$ , $\delta$ , and $\epsilon$
Removal of RNA primers	DNA polymerase I (5' 3' exonuclease) RNase H (5' 3')
Replacement of RNA with DNA	DNA polymerase I
DNA polymerase $\delta$	Joining of Okazaki fragments
Removal of positive supercoils ahead of advancing replication forks	Synthesis of telomeres
	DNA polymerases $\alpha$ , $\delta$ , and $\epsilon$ work together to synthesize both the leading and lagging strands;

DNA polymerase  $\delta$  also fills in the gaps left behind when RNA primers are removed. DNA polymerase  $\gamma$  replicates mitochondrial DNA. DNA polymerases  $\beta$  and  $\epsilon$  are important to the process of DNA repair. DNA polymerases  $\delta$  and  $\epsilon$  are assisted by the PCNA protein, which assembles into a trimer to form the sliding clamp. The clamp helps to strengthen the interaction between these DNA polymerases and the DNA template.

### Replicating the Ends of Chromosomes

While DNA polymerase does an excellent job of synthesizing DNA, it unfortunately cannot complete synthesis of the 5' end of the strand. Thus, each time DNA synthesis is carried out, the chromosome becomes a little shorter. To lengthen the time that cells can replicate and synthesize DNA before necessary genes are damaged, chromosomes contain telomeres. As described earlier, telomeres are located at the very tips of the chromosome and consist of repetitive sequences with a high GC-content. This repetition means that telomeres can be slightly degraded between replication cycles without loss of function.

### MCAT CONCEPT CHECK 6.3

Before you move on, assess your understanding of the material with these questions.

1. For each of the enzymes listed below, list the function of the enzyme and if it is found in prokaryotes, eukaryotes, or both.
  - DNA polymerase III
  - DNA polymerase  $\alpha$
  - DNA polymerase I
2. Between the leading strand and lagging strand, which is more prone to mutations?
3. What is the function of a telomere?

### 6.4 DNA Repair

After Chapter 6.4, you will be able to:

- Describe the major DNA repair processes, including proofreading, mismatch repair, and excision repair.
- Recognize the key components and locations of each DNA repair process, including both mismatch and excision processes.
- Identify major traits of oncogenes and tumor suppressor genes.

The structure of DNA can be damaged in a number of ways such as exposure to chemicals or radiation. DNA is very susceptible to damage and if the damage is not corrected, it will subsequently be copied and passed on to daughter cells. Damage can include breaking of the DNA backbone, structural or spontaneous alterations of bases, or incorporation of the incorrect base during replication. Any defect in the genetic code can cause an increased risk of cancer, so the cell has multiple processes in place to catch and correct genetic errors. This helps maintain the integrity and stability of the genome from cell to cell, and from generation to generation.

to generation. Oncogenes and Tumor Suppressor Genes Certain genes, when mutated, can lead to cancer. Cancer cells proliferate excessively because they are able to divide without stimulation from other cells and are no longer subject to the normal controls on cell proliferation. By definition, cancer cells are able to migrate by local invasion or metastasis, a migration to distant tissues by the bloodstream or lymphatic system. Over time, cancer cells tend to accumulate mutations. Mutated genes that cause cancer are termed oncogenes. Oncogenes primarily encode cell cycle-related proteins. Before these genes are mutated, they are often referred to as proto-oncogenes. The first gene in this category to be discovered was src (named after sarcoma, a category of connective tissue cancers). The abnormal alleles encode proteins that are more active than normal proteins, promoting rapid cell cycle advancement. Typically, a mutation in only one copy is sufficient to promote tumor growth and is therefore considered dominant. While the outcome of oncogenes and mutated tumor suppressor genes is the same (cancer), the actual cause is different. Oncogenes promote the cell cycle while mutated tumor suppressors can no longer slow the cell cycle. Oncogenes are like stepping on the gas pedal; mutated tumor suppressors are like cutting the brakes. Tumor suppressor genes, like p53 or Rb (retinoblastoma), encode proteins that inhibit the cell cycle or participate in DNA repair processes. They normally function to stop tumor progression, and are sometimes called antioncogenes. Mutations of these genes result in the loss of tumor suppression activity, and therefore promote cancer. Inactivation of both alleles is necessary for the loss of function because, in most cases, even one copy of the normal protein can function to inhibit tumor formation. In this example, multiple mutations or "hits" are required.

Proofreading and Mismatch Repair DNA polymerase moves along a single strand of DNA, building the complementary strand as it goes. While DNA polymerase is almost 100 percent accurate, it does occasionally make errors. During synthesis, the two double-stranded DNA molecules will pass through a part of the DNA polymerase enzyme for proofreading. When the complementary strands have incorrectly paired bases, the hydrogen bonds between the strands can be unstable, and this lack of stability is detected as the DNA passes through this

part of the polymerase. The incorrect base is excised and can be replaced with the correct one, as shown in Figure 6.16. If both the parent and daughter strands are simply DNA, how does the enzyme discriminate which is the template strand, and which is the incorrectly paired daughter strand? It looks at the level of methylation: the template strand has existed in the cell for a longer period of time, and therefore is more heavily methylated. Methylation also plays a role in the transcriptional activity of DNA, as described in Chapter 7 of MCAT Biochemistry Review. This system is very efficient, correcting most of the errors put into the sequence during replication. DNA ligase, which closes the gaps between Okazaki fragments, lacks proofreading ability. Thus, the likelihood of mutations in the lagging strand is considerably higher than the leading strand.

**Figure 6.16 Proofreading by DNA Polymerase**

Cells also have machinery in the G2 phase of the cell cycle for mismatch repair; these enzymes are encoded by genes MSH2 and MLH1, which detect and remove errors introduced in replication that were missed during the S phase of the cell cycle. These enzymes are homologues of MutS and MutL in prokaryotes, which serve a similar function.

**Nucleotide and Base Excision Repair**

Most of the repair mechanisms involve proteins that recognize damage or a lesion, remove the damage, and then use the complementary strand as a template to fill in the gap. Our cell machinery recognizes two specific types of DNA damage in the G1 and G2 cell cycle phases and fixes them through nucleotide excision repair or base excision repair.

**Nucleotide Excision Repair**

Ultraviolet light induces the formation of dimers between adjacent thymine residues in DNA. The formation of thymine dimers interferes with DNA replication and normal gene expression, and distorts the shape of the double helix. Thymine dimers are eliminated from DNA by a nucleotide excision repair (NER) mechanism, which is a cut-and-patch process, as shown in Figure 6.17. First, specific proteins scan the DNA molecule and recognize the lesion because of a bulge in the strand. An excision endonuclease then makes nicks in the phosphodiester backbone of the damaged strand on both sides of the thymine dimer and removes the defective oligonucleotide. DNA polymerase can then fill in the gap by synthesizing DNA in the 5' to 3' direction, using the undamaged strand as a template. Finally,

the nick in the strand is sealed by DNA ligase. Figure 6.17 Thymine Dimer Formation and Nucleotide Excision Repair Base Excision Repair Alterations to bases can occur with other cellular insults. For example, thermal energy can be absorbed by DNA and may lead to cytosine deamination. This is the loss of an amino group from cytosine and results in the conversion of cytosine to uracil. Uracil should not be found in a DNA molecule and is thus easily detected as an error; however, detection systems exist for small, non-helix-distorting mutations in other bases as well. These are repaired by base excision repair. First, the affected base is recognized and removed by a glycosylase enzyme, leaving behind an apurinic/apyrimidinic (AP) site, also called an abasic site. The AP site is recognized by an AP endonuclease that removes the damaged sequence from the DNA. DNA polymerase and DNA ligase can then fill in the gap and seal the strand, as described above. MCAT CONCEPT CHECK

6.4 Before you move on, assess your understanding of the material with these questions. 1. What is the difference between an oncogene and a tumor suppressor gene? 2. How does DNA polymerase recognize which strand is the template strand once the daughter strand is synthesized? 3. For each of the repair mechanisms below, in which phase of the cell cycle does the repair mechanism function? What are the key enzymes or genes specifically associated with each mechanism? Phase of Cell Nucleotide excision repair Base excision repair 4. What is the key structural difference in the types of lesions corrected by nucleotide excision repair vs. those corrected by base excision repair? 6.5 Recombinant DNA and Biotechnology After Chapter 6.5, you will be able to: Predict the most effective DNA library technique for a given laboratory application Recall the inputs and outputs of biotechnology techniques, including PCR, Southern blotting, and sequencing Describe the differences between transgenic mice and knockout mice Now that we have reviewed the basics of DNA structure and function, we can discuss how this knowledge has been harnessed for a variety of research and treatment innovations. Recombinant DNA technology allows a DNA fragment from any source to be multiplied by either gene cloning or polymerase chain reaction (PCR). This provides a means of analyzing and altering genes and proteins. It also provides the reagents necessary for genetic

testing, such as carrier detection (detecting hetero-zygote status for a particular disease) and prenatal diagnosis of genetic diseases; it is also useful for gene therapy. Additionally, this technology can provide a source of a specific protein, such as recombinant human insulin, in almost unlimited quantities. The process of creating recombinant DNA (by gene cloning) and its benefits are shown in Figure 6.18.

**Figure 6.18 Cloning Recombinant DNA** Cloning allows production of recombinant proteins, or identification and characterization of DNA by increasing its volume and purity.

**DNA Cloning and Restriction Enzymes** DNA cloning is a technique that can produce large amounts of a desired sequence. Often, the DNA to be cloned is present in a small quantity and is part of a heterogeneous mixture containing other DNA sequences. The goal is to produce a large quantity of homogeneous DNA for other applications. Cloning requires that the investigator ligate the DNA of interest into a piece of nucleic acid referred to as a vector, forming a recombinant vector. Vectors are usually bacterial or viral plasmids that can be transferred to a host bacterium after insertion of the DNA of interest. The bacteria are then grown in colonies, and a colony containing the recombinant vector is isolated. This can be accomplished by ensuring that the recombinant vector also includes a gene for antibiotic resistance; antibiotics can then kill off all of the colonies that do not contain the recombinant vector. The resulting colony can then be grown in large quantities. Depending on the investigator's goal, the bacteria can then be made to express the gene of interest (generating large quantities of recombinant protein), or can be lysed to reisolate the replicated recombinant vectors (which can be processed by restriction enzymes to release the cloned DNA from the vector).

**Restriction enzymes (restriction endonucleases)** are enzymes that recognize specific double-stranded DNA sequences. These sequences are palindromic, meaning that the 5' to 3' sequence of one strand is identical to the 5' to 3' sequence of the other strand (in antiparallel orientation). Restriction enzymes are isolated from bacteria, which are their natural source. In bacteria, they act as part of a restriction and modification system that protects the bacteria from infection by DNA viruses. Once a specific sequence has been identified, the restriction enzyme can cut through the

backbones of the double helix. Thousands of restriction enzymes have been studied and many are commercially available to laboratories, allowing us to process DNA in very specific ways. Some restriction enzymes produce offset cuts, yielding sticky ends on the fragments, as shown in Figure 6.19. Sticky ends are advantageous in facilitating the recombination of a restriction fragment with the vector DNA. The vector of choice can also be cut with the same restriction enzyme, allowing the fragments to be inserted directly into Figure 6.19 A Restriction Enzyme (EcoRI) Creating Sticky Ends Restriction enzymes cut at palindromic sequences, such as GAATTC. DNA vectors contain at least one sequence, if not many, recognized by restriction enzymes. A vector also requires an origin of replication and at least one gene for antibiotic resistance to allow for selection of colonies with recombinant plasmids, as described above. The formation of a recombinant plasmid is shown in Figure 6.20. Figure 6.20 Formation of a Recombinant Plasmid Vector ori: origin of replication; ampr: gene for resistance to ampicillin (an antibiotic) DNA Libraries and cDNA DNA cloning can be used to produce DNA libraries. DNA libraries are large collections of known DNA sequences; in sum, these sequences could equate to the genome of an organism. To make a DNA library, DNA fragments, often digested randomly, are cloned into vectors and can be utilized for further study. Libraries can consist of either genomic DNA or cDNA. Genomic libraries contain large fragments of DNA, and include both coding (exon) and noncoding (intron) regions of the genome. cDNA (complementary DNA) libraries are constructed by reverse-transcribing processed mRNA, as shown in Figure 6.21. As such, cDNA lacks noncoding regions, such as introns, and only includes the genes that are expressed in the tissue from which the mRNA was isolated. For that reason, these libraries are sometimes called expression libraries. While genomic libraries contain the entire genome of an organism, genes may by chance be split into multiple vectors. Therefore, only cDNA libraries can be used to reliably sequence specific genes and identify disease-causing mutations, produce recombinant proteins (such as insulin, clotting factors, or vaccines), or produce transgenic animals. Several of these applications are discussed in more detail in subsequent sections of this chapter. Table 6.3 contrasts some of

the characteristics of genomic and cDNA libraries. Figure 6.21 Cloning Expressed Genes by Producing cDNA Table 6.3 Comparison of Genomic and cDNA (Expression) Libraries

Source of DNA	Enzymes to make library	Contains nonexpressed sequences	Cloned genes are complete sequences	Cloned genes contain introns	Promoter and enhancer sequences	Yes, but not necessarily in same Gene	Can be expressed in cloning host	Can be used for gene therapy or constructing transgenic animals
Genomic		Yes	No	Yes	Yes	Yes	Yes	Yes
cDNA		No	Yes	No	No	No	No	No

Another tool often used by researchers is called hybridization. Hybridization is the joining of complementary base pair sequences. This can be DNA–DNA recognition or DNA–RNA recognition. This technique uses two single-stranded sequences and is a vital part of polymerase chain reaction and Southern blotting. Polymerase Chain Reaction Polymerase chain reaction (PCR) is an automated process that can produce millions of copies of a DNA sequence without amplifying the DNA in bacteria. PCR is used to identify criminal suspects, familial relationships, and disease-causing bacteria and viruses. Knowing the sequences that flank the desired region of DNA allows for the amplification of the sequence in between. A PCR reaction requires primers that are complementary to the DNA that flanks the region of interest, nucleotides (dATP, dTTP, dCTP, and dGTP), and DNA polymerase. The primer has high GC content (40–60% is optimal), as the additional hydrogen bonds between G and C confer stability. The reaction also needs heat to cause the DNA double helix to melt apart (denature). Unfortunately, the DNA polymerase found in the human body does not work at high temperatures. Thus, the DNA polymerase from *Thermus aquaticus*, a bacteria that thrives in the hot springs of Yellowstone National Park at 70°C, is used instead. During PCR, the DNA of interest is denatured, replicated, and then cooled to allow reannealing of the daughter strands with the parent strands. This process is repeated several times, doubling the amount of DNA with each cycle, until enough copies of the DNA sequence are available for further testing. PCR provides a great example of the temperature dependence of enzymes. While human DNA polymerase denatures at the high temperatures required in PCR, the DNA polymerase from *T. aquaticus* functions optimally at these temperatures. Refer to Chapter 2 of MCAT Biochemistry Review for more on the link between temperature and



enzyme activity. Gel Electrophoresis and Southern Blotting Gel electrophoresis is a technique used to separate macromolecules, such as DNA and proteins, by size and charge. Electrophoresis of proteins was discussed in detail in Chapter 3 of MCAT Biochemistry Review, but DNA can be separated in a similar way. All molecules of DNA are negatively charged because of the phosphate groups in the backbone of the molecule, so all DNA strands will migrate toward the anode of an electrochemical cell. The preferred gel for DNA electrophoresis is agarose gel, and—just like proteins in polyacrylamide gel—the longer the DNA strand, the slower it will migrate in the gel. Gel electrophoresis is often used while performing a Southern blot. A Southern blot is used to detect the presence and quantity of various DNA strands in a sample. DNA is cut by restriction enzymes and then separated by gel electrophoresis. The DNA fragments are then carefully transferred to a membrane, retaining their separation. The membrane is then probed with many copies of a single-stranded DNA sequence. The probe will bind to its complementary sequence and form double-stranded DNA. Probes are labeled with radioisotopes or indicator proteins, both of which can be used to indicate the presence of a desired sequence. DNA sequencing has revolutionized the world that we live in. The applications of this technique are far-reaching, from the medical field to criminal legal system. A basic sequencing reaction contains the main players from replication, including template DNA, primers, an appropriate DNA polymerase, and all four deoxyribonucleotide triphosphates. In addition, a modified base called a dideoxyribonucleotide is added in lower concentrations. Dideoxyribonucleotides (ddATP, ddCTP, ddGTP, and ddTTP) contain a hydrogen at C-3', rather than a hydroxyl group; thus, once one of these modified bases has been incorporated, the polymerase can no longer add to the chain. Eventually the sample will contain many fragments (as many as the number of nucleotides in the desired sequence), each one of which terminates with one of the modified bases. These fragments are then separated by size using gel electrophoresis. The last base for each fragment can be read, and because gel electrophoresis separates the strands by size, the bases can easily be read in order. The Human Genome Project, initiated in 1991, involved the

identification of all 3 billion base pairs of the human DNA sequence. The first draft of this project was completed in 2000. This project demonstrated that although humans appear to be quite different from each other, the sequence of our DNA is, in reality, highly conserved. On average, two unrelated individuals still share over 99.9% of their DNA sequences.

**Applications of DNA Technology**

In addition to its utility as a research tool, DNA biotechnology has led to a number of therapeutic breakthroughs, ranging from gene therapy—described in this section—to development of personalized chemotherapeutic regimens in cancer by genotyping the tumor cells. DNA technology is also used in industry, including the development of genetically modified foods that are enriched with specific nutrients and testing of the environment for risk assessment and cleanup procedures. As mentioned previously, DNA technology also plays a key role in forensic pathology and crime scene investigation. This is likely only the beginning, as biotechnology continues to be an active area of research.

Gene therapy now offers potential cures for individuals with inherited diseases. Gene therapy is intended for diseases in which a given gene is mutated or inactive, giving rise to pathology. By transferring a normal copy of the gene into the affected tissues, the pathology should be fixed, essentially curing the individual. For instance, about half of children with severe combined immunodeficiency (SCID) have a mutation in the gene encoding the  $\gamma$  chain common to several of the interleukin receptors. By placing a working copy of the gene for the  $\gamma$  chain into a virus, one can transmit the functional gene into human cells. The first successful case of gene therapy was for SCID (caused by a different mutation) in 1990. For gene replacement therapy to be a realistic possibility, efficient gene delivery vectors must be used to transfer the cloned gene into the target cells' DNA. Because viruses naturally infect cells to insert their own genetic material, most gene delivery vectors in use are modified viruses. A portion of the viral genome is replaced with the cloned gene such that the virus can infect but not complete its replication cycle, as shown in Figure 6.22. Randomly integrated DNA poses a risk of integrating near and activating a host oncogene. Among the children treated for SCID, a small number have developed leukemias (cancers of white blood cells).

Figure 6.22 Retroviral

Gene Therapy The example given here uses a retrovirus, but other viruses may also be used for gene therapy.

Transgenic and Knockout Mice Once DNA has been isolated, it can be introduced into eukaryotic cells. Transgenic mice are altered at their germ line by introducing a cloned gene into fertilized ova or into embryonic stem cells. The cloned gene that is introduced is referred to as a transgene. If the transgene is a disease-producing allele, the transgenic mice can be used to study the disease process from early embryonic development through adulthood. A similar approach can be used to produce knockout mice, in which a gene has been intentionally deleted (knocked out). These mice provide valuable models in which to study human diseases. There are different approaches to developing transgenic mice. A cloned gene may be microinjected into the nucleus of a newly fertilized ovum. Rarely, the gene may subsequently incorporate into the nuclear DNA of the zygote. The ovum is implanted into a surrogate, and, if successful, the resulting offspring will contain the transgene in all of their cells, including their germ line cells (gametes). Consequently, the transgene will also be passed to their offspring. The transgene coexists in the animals with their own copies of the gene, which have not been deleted. This approach is useful for studying dominant gene effects but is less useful as a model for recessive disease because the number of copies of the gene that insert into the genome cannot be controlled; the transgenic mice may each contain a different number of copies of the transgene. This method is demonstrated in Figure 6.23.

Figure 6.23 Creation of a Transgenic Mouse Embryonic stem cell lines can also be used for developing transgenic mice. Advantages of using stem cell lines are that the cloned genes can be introduced in cultures, and that one can select for cells with the transgene successfully inserted. The altered stem cells are injected into developing blastocysts and implanted into surrogates. The blastocyst itself is thus composed of two types of stem cells: the ones containing the transgene and the original blastocyst cells that lack the transgene. The resulting offspring is a chimera, meaning that it has patches of cells, including germ cells, derived from each of the two lineages. This is evident if the two cell lineages (transgenic cells and host blastocyst) come from mice with different coat colors. The chimeras

will have patchy coats of two colors, allowing them to be easily identified. These chimeras can then be bred to produce mice that are heterozygous for the transgene and mice that are homozygous for the transgene. The story of Jesse Gelsinger is one particularly harrowing example of the problems that biotechnology can create. Diagnosed with mild ornithine transcarbamylase (OTC) deficiency, a defect of the urea cycle, Gelsinger volunteered for a clinical trial of gene therapy. During the trial (which was also fraught with questionable consent practices), Gelsinger died from a massive immune response to the viral vector, leading to multiple organ failure and brain death. He was 18 years old.

### Safety and Ethics

The different procedures and techniques that have been reviewed provide great insight for researchers in many different fields of study. However, it is also important to acknowledge the potential risks associated with these technologies. Safety concerns such as increased resistance in viruses and bacteria can impact both humans and the environment in which we live. Ethical dilemmas arise: Is it ethical to test for life-threatening genetic diseases and potentially terminate a pregnancy based on the results? What about testing for eye or hair color? What are the ethical questions around choosing human test subjects? If a disease-causing gene were found in one individual of a family, does this need to be communicated to other relatives at risk, potentially violating principles of privacy? Is it permissible to carry out potentially risky therapies in individuals whose illnesses makes them unable to communicate? The medical community and bioethicists at large continue to wrestle with this question: How much should we meddle with our own genetic makeup?

### MCAT CONCEPT CHECK 6.5

Before you move on, assess your understanding of the material with these questions.

1. When creating a DNA library, what are some of the advantages of genomic libraries? What about cDNA libraries?
2. What does PCR accomplish for a researcher? What about Southern blotting?
3. During DNA sequencing, why does the DNA polymer stop growing once a dideoxynucleotide is added?
4. What is the difference between a transgenic and a knockout mouse?

In this chapter, the DNA molecule was discussed. The importance of this molecule as an archive in the cell was highlighted. The unique structure of the DNA double helix and complementary base-pairing are integral to

DNA molecules' ability to replicate and pass information from cell to cell and from generation to generation. Replication of DNA is a complex process involving many enzymes and proteins that are highly coordinated to ensure efficiency. The discoveries of DNA structure and function aid us in understanding how cellular processes take place but also provide us with many tools to exploit in the laboratory. DNA is one of the most heavily tested concepts on the MCAT. This makes sense because not only has our understanding of the molecule increased exponentially over the last few decades, but also our ability to manipulate DNA. This has led to the creation of an entire industry of biotechnology that will assuredly grow during your career as a medical student and physician. In the next chapter, we turn to DNA's counterpart, RNA. We'll explore how the genes discussed in this chapter can actually turn into functional proteins through the key processes of transcription and translation. You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources!

Deoxyribonucleic acid (DNA) is a macromolecule that stores genetic information in all living organisms. Nucleosides contain a five-carbon sugar bonded to a nitrogenous base; nucleotides are nucleosides with one to three phosphate groups. Nucleotides in DNA contain deoxyribose; in RNA, they contain ribose. Nucleotides are abbreviated by letter: adenine (A), cytosine (C), guanine (G), thymine (T), and uracil (U). DNA is organized according to the Watson-Crick model. The backbone is composed of alternating sugar and phosphate groups, and is always read 5' to 3'. There are two strands with antiparallel polarity, wound into a double helix. Purines (A and G) always pair with pyrimidines (C, U, and T). In DNA, A pairs with T (via two hydrogen bonds) and C pairs with G (via three hydrogen bonds). RNA does not contain thymine, but contains uracil instead; thus, in RNA, A pairs with U (via two hydrogen bonds). Purines and pyrimidines are biological aromatic heterocycles. Aromatic compounds are cyclic, planar, and conjugated, and contain  $4n + 2 \pi$  electrons (where  $n$  is any integer; Hückel's rule). Heterocycles are ring structures that contain at least two different elements in the ring. Chargaff's rules state that purines and pyrimidines are equal in number in a DNA molecule, and that because of base-pairing, the amount of adenine equals the amount of thymine, and the amount of cytosine equals the amount of guanine.

guanine. Most DNA is B-DNA, forming a right-handed helix. Low concentrations of Z-DNA, with a zigzag shape, may be seen with high GC-content or high salt concentration. DNA strands can be pulled apart (denatured) and brought back together (reannealed). Heat, alkaline pH, and chemicals like formaldehyde and urea can cause denaturation of DNA; removal of these conditions may result in reannealing of the strands.

### Eukaryotic Chromosome Organization

DNA is organized into 46 chromosomes in human cells. In eukaryotes, DNA is wound around histone proteins (H2A, H2B, H3, and H4) to form nucleosomes, which may be stabilized by another histone protein (H1). As a whole, DNA and its associated histones make up chromatin in the nucleus. Heterochromatin is dense, transcriptionally silent DNA that appears dark under light microscopy. Euchromatin is less dense, transcriptionally active DNA that appears light under light microscopy. Telomeres are the ends of chromosomes. They contain high GC-content to prevent unraveling of the DNA. During replication, telomeres are slightly shortened, although this can be (partially) reversed by the enzyme telomerase. Centromeres are located in the middle of chromosomes and hold sister chromatids together until they are separated during anaphase in mitosis. They also contain a high GC-content to maintain a strong bond between chromatids. The replisome (replication complex) is a set of specialized proteins that assist the DNA polymerases. To replicate DNA, it is first unwound at an origin of replication by helicases. This produces two replication forks on either side of the origin. Prokaryotes have a circular chromosome that contains only one origin of replication. Eukaryotes have linear chromosomes that contain many origins of replication. Unwound strands are kept from reannealing or being degraded by single-stranded DNA-binding proteins. Supercoiling causes torsional strain on the DNA molecule, which can be released by DNA topoisomerases, which create nicks in the DNA. DNA replication is semiconservative: one old parent strand and one new daughter strand is incorporated into each of the two new DNA molecules. DNA cannot be synthesized without an adjacent nucleotide to hook onto, so a small RNA primer is put down by primase. DNA polymerase III (prokaryotes) or DNA polymerases  $\alpha$ ,  $\delta$ , and  $\epsilon$  (eukaryotes) can then synthesize a new strand of DNA; they read the template DNA 3' to 5' and synthesize the new

strand 5' to 3'. The leading strand requires only one primer and can then be synthesized continuously in its entirety. The lagging strand requires many primers and is synthesized in discrete sections called Okazaki fragments. RNA primers can later be removed by DNA polymerase I (prokaryotes) or RNase H (eukaryotes), and filled in with DNA by DNA polymerase I (prokaryotes) or DNA polymerase  $\delta$  (eukaryotes). DNA ligase can then fuse the DNA strands together to create one continuous strand.

Oncogenes develop from mutations of proto-oncogenes, and promote cell cycling. They may lead to cancer, which is defined by unchecked cell proliferation with the ability to spread by local invasion or metastasize (migrate to distant sites via the bloodstream or lymphatic system). Tumor suppressor genes code for proteins that reduce cell cycling or promote DNA repair; mutations of tumor suppressor genes can also lead to cancer. During replication, DNA polymerase proofreads its work and excises incorrectly matched bases. The daughter strand is identified by its lack of methylation and corrected accordingly. Mismatch repair also occurs during the G2 phase of the cell cycle, using the genes MSH2 and MLH1. Nucleotide excision repair fixes helix-deforming lesions of DNA (such as thymine dimers) via a cut-and-patch process that requires an endonuclease. Base excision repair fixes nondeforming lesions of the DNA helix (such as cytosine deamination) by removing the base, leaving an apurinic/apyrimidinic (AP) site. An AP endonuclease then removes the damaged sequence, which can be filled in with the correct bases.

Recombinant DNA and Biotechnology

Recombinant DNA is DNA composed of nucleotides from two different sources. DNA cloning introduces a fragment of DNA into a vector plasmid. A restriction enzyme (restriction endonuclease) cuts both the plasmid and the fragment, which are left with sticky ends. Once the fragment binds to the plasmid, it can be introduced into a bacterial cell and permitted to replicate, generating many copies of the fragment. Vectors contain an origin of replication, the fragment of interest, and at least one gene for antibiotic resistance (to permit for selection of that colony after replication). Once replicated, the bacterial cells can be used to create a protein of interest, or can be lysed to allow for isolation of the fragment of interest from the vector. DNA libraries are large collections of known DNA sequences. Genomic libraries contain large

fragments of DNA, including both coding and noncoding regions of the genome. They cannot be used to make recombinant proteins or for gene therapy. cDNA libraries (expression libraries) contain smaller fragments of DNA, and only include the exons of genes expressed by the sample tissue. They can be used to make recombinant proteins or for gene Hybridization is the joining of complementary base pair sequences. Polymerase chain reaction (PCR) is an automated process by which millions of copies of a DNA sequence can be created from a very small sample by hybridization. DNA molecules can be separated by size using agarose gel Southern blotting can be used to detect the presence and quantity of various DNA strands in a sample. After electrophoresis, the sample is transferred to a membrane that can be probed with single-stranded DNA molecules to look for a sequence of interest. DNA sequencing uses dideoxyribonucleotides, which terminate the DNA chain because they lack a 3' OH group. The resulting fragments can be separated by gel electrophoresis, and the sequence can be read directly from the gel. Gene therapy is a method of curing genetic deficiencies by introducing a functional gene with a viral vector. Transgenic mice are created by integrating a gene of interest into the germ line or embryonic stem cells of a developing mouse. Organisms that contain cells from two different lineages (such as mice formed by integration of transgenic embryonic stem cells into a normal mouse blastocyst) are called chimeras. Transgenic mice can be mated to select for the transgene. Knockout mice are created by deleting a gene of interest. Biotechnology brings up a number of safety and ethical issues, including pathogen resistance and the ethics of choosing individuals for specific traits.

Answers to Concept Checks

1. Nucleosides contain a five-carbon sugar (pentose) and nitrogenous base. Nucleotides are composed of a nucleoside plus one to three
2. A pairs with T (in DNA) or U (in RNA), using two hydrogen bonds. C pairs with G, using three hydrogen bonds.
3. DNA contains deoxyribose, while RNA contains ribose. DNA contains thymine, while RNA contains uracil. Usually, DNA is double-stranded, while RNA is single-stranded.
4. The aromaticity of nucleic acids makes these compounds very stable and unreactive. Stability is important for storing genetic information and avoiding spontaneous mutations.
5. This does not violate Chargaff's rules. RNA is



single-stranded, and thus the complementarity seen in DNA does not hold true. For single-stranded RNA, %C does not necessarily equal %G; %A does not necessarily equal %U. 1. The five histone proteins are H1, H2A, H2B, H3, and H4. H1 is the only one not in the histone core. Density of chromatin packing Not dense (uncondensed) Appearance under light microscopy 3. High GC-content increases hydrogen bonding, making the association between DNA strands very strong at telomeres and centromeres. Unwinds DNA double helix Prevents reannealing of DNA double helix during replication Places ~10-nucleotide RNA primer to begin DNA replication DNA polymerase III Adds nucleotides to growing DNA polymerase  $\alpha$  Adds nucleotides to growing DNA polymerase I Fills in gaps left behind after RNA Excises RNA primer Joins DNA strands (especially between Okazaki fragments) Reduces torsional strain from positive supercoils by introducing nicks in DNA strand 2. The lagging strand is more prone to mutations because it must constantly start and stop the process of DNA replication. Additionally, it contains many more RNA primers, all of which must be removed and filled in with DNA. 3. Telomeres are the ends of eukaryotic chromosomes and contain repetitive sequences of noncoding DNA. These protect the chromosome from losing important genes from the incomplete replication of the 5' end of the DNA strand. 1. Oncogenes (or, more properly, proto-oncogenes) code for cell cycle– promoting proteins; when mutated, a proto-oncogene becomes an oncogene, promoting rapid cell cycling. Tumor suppressor genes code for repair or cell cycle–inhibiting proteins; when mutated, the cell cycle is allowed to proceed unchecked. Oncogenes are like stepping on the gas pedal, mutated tumor suppressor genes are like cutting the brakes. 2. The parent strand is more heavily methylated, whereas the daughter strand is barely methylated at all. This allows DNA polymerase to distinguish between the two strands during proofreading. Phase of Cell MSH2, MLH1(MutS and MutL in Nucleotide excision repair Base excision repair Glycosylase, AP endonuclease 4. Nucleotide excision repair corrects lesions that are large enough to distort the double helix; base excision repair corrects lesions that are small enough not to distort the double helix. 1. Genomic libraries include all of the DNA in an organism's genome, including noncoding

regions. This may be useful for studying DNA in introns, centromeres, or telomeres. cDNA libraries only include expressed genes from a given tissue, but can be used to express recombinant proteins or to perform gene therapy. 2. PCR increases the number of copies of a given DNA sequence and can be used for a sample containing very few copies of the DNA sequence. Southern blotting is useful when searching for a particular DNA sequence because it separates DNA fragments by length and then probes for a sequence of interest. 3. Dideoxynucleotides lack the 3' OH group that is required for DNA strand elongation. Thus, once a dideoxynucleotide is added to a growing DNA molecule, no more nucleotides can be added because dideoxynucleotides have no 3' OH group with which to form a 4. Transgenic mice have a gene introduced into their germ line or embryonic stem cells to look at the effects of that gene; they are therefore best suited for studying the effects of dominant alleles. Knockout mice are those in which a gene of interest has been removed, rather than added. Science Mastery Assessment Nucleotides bond together to form polynucleotides. The 3' hydroxyl group of one nucleotide's sugar joins the 5' hydroxyl group of the adjacent nucleotide's sugar by a phosphodiester bond. Hydrogen bonding, (A), is important for holding complementary strands together, but does not play a role in the bonds formed between adjacent nucleotides on a single strand. Because we are looking for the false statement, we have to read each choice to eliminate those that are true or find one that is overtly false. Let's quickly review the main differences between DNA and RNA. In cells, DNA is double-stranded, with a deoxyribose sugar and the nitrogenous bases A, T, C, and G. RNA, on the other hand, is usually single-stranded, with a ribose sugar and the bases A, U, C, and G. (D) is false because both DNA replication and RNA synthesis proceed in a 5' to 3' direction. The melting temperature of DNA is the temperature at which a DNA double helix separates into two single strands (denatures). To do this, the hydrogen bonds linking the base pairs must be broken. Cytosine binds to guanine with three hydrogen bonds, whereas adenine binds to thymine with two hydrogen bonds. The amount of heat needed to disrupt the bonding is proportional to the number of bonds. Thus, the higher the GC-content in a DNA segment, the higher the

melting point. Aromatic rings must contain conjugated  $\pi$  electrons, which require alternating single and multiple bonds, or lone pairs. In carbohydrate ring structures, only single bonds are present, thus preventing aromaticity. Nucleic acids contain aromatic heterocycles, while proteins will generally contain at least one aromatic amino acid (tryptophan, phenylalanine, or tyrosine). For a compound to be aromatic, it must be cyclic, planar, conjugated, and contain  $4n + 2 \pi$  electrons, where  $n$  is any integer. Conjugation requires that every atom in the ring have at least one unhybridized p-orbital. While most examples of aromatic compounds have alternating single and double bonds, compounds can be aromatic if they contain triple bonds as well; this would still permit at least one unhybridized p-orbital. During DNA replication, the strands are separated by DNA helicase. At the replication fork, primase, (A), creates a primer for the initiation of replication, which is followed by DNA polymerase. On the lagging strand, Okazaki fragments form and are joined by DNA ligase, (B). After the chromosome has been processed, the ends, called telomeres, are replicated with the assistance of the enzyme telomerase, (D). RNA polymerase I is located in the nucleolus and synthesizes rRNA. cDNA (complementary DNA) is formed from a processed mRNA strand by reverse transcription. cDNA is used in DNA libraries and contains only the exons of genes that are transcriptionally active in the sample tissue. The polymerase chain reaction is used to clone a sequence of DNA using a DNA sample, a primer, free nucleotides, and enzymes. The polymerase from *Thermus aquaticus* is used because the reaction is regulated by thermal cycling, which would denature human enzymes. Endonucleases are enzymes that cut DNA. They are used by the cell for DNA repair. They are also used by scientists during DNA analysis, as restriction enzymes are endonucleases. Restriction enzymes are used to cleave DNA before electrophoresis and Southern blotting, and to introduce a gene of interest into a viral vector for gene therapy. Prokaryotic DNA is circular and lacks histone proteins, and thus does not form nucleosomes. Both prokaryotic and eukaryotic DNA are replicated by DNA polymerases, although these polymerases differ in identity. Eukaryotic DNA is organized into chromatin, which can condense to form linear chromosomes; only prokaryotes have circular chromosomes. Only

eukaryotic DNA has telomeres. One common DNA mutation is the transition from cytosine to uracil in the presence of heat. DNA repair enzymes recognize uracil and correct this error by excising the base and inserting cytosine. RNA exists only transiently in the cell, such that cytosine degradation is insignificant. Were uracil to be used in DNA under normal circumstances, it would be impossible to tell if a base should be uracil or if it is a damaged cytosine. Oncogenes are most likely to result in cancer through activation, (B), while tumor suppressor genes are most likely to result in cancer through inactivation, (A). One of the primary ethical concerns related to gene sequencing is the issue of consent and privacy. Because genetic screening provides information on direct relatives, there are potential violations of privacy in communicating this information to family members who may be at risk. There are not significant physical risks, eliminating (A), and gene sequencing is fairly accurate, eliminating (C) and (D). Euchromatin has a classic “beads on a string” appearance that stains lightly, while heterochromatin is tightly packed and stains darkly. Heterochromatin is primarily composed of inactive genes or untranslated regions, while euchromatin is able to be expressed. All chromatin is found in the nucleus, not the cytoplasm. Mismatch repair mechanisms are active during S phase (proofreading) and G2 phase (MSH2 and MLH1), eliminating (B) and (C). Nucleotide and base excision repair mechanisms are most active during the G1 and G2 phases, also eliminating (A). These mechanisms exist during interphase because they are aimed at preventing propagation of the error into daughter cells during M phase (mitosis). Consult your online resources for additional practice. Biochemistry Chapter 4 Carbohydrate Structure and Function Biochemistry Chapter 7 RNA and the Genetic Code Biology Chapter 1 Biology Chapter 2 Biology Chapter 3 Embryogenesis and Development Biology Chapter 12 Genetics and Evolution RNA and the Genetic Code Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what’s important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help

ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate.

**How to Use This Assessment**

If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one.

If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect.

If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. What role does peptidyl transferase play in protein synthesis?

A. It transports the initiator aminoacyl-tRNA complex. B. It helps the ribosome to advance three nucleotides along the mRNA in the 5' to 3' direction. C. It holds the protein in its tertiary structure. D. It catalyzes the formation of a peptide bond.

2. A mutation in which of the following components of the lac operon would lead to a significant reduction in the expression of lactase (one of the structural genes)?

A. Regulatory gene D. Structural genes

3. Topoisomerases are enzymes involved in:

A. DNA replication and transcription. B. posttranscriptional processing. C. RNA synthesis and translation. D. posttranslational processing.

4. Val-tRNA<sup>Val</sup> is the tRNA that carries valine to the ribosome during translation. Which of the following sequences gives an appropriate anticodon for this tRNA? (Note: Refer to Figure 7.5 for a genetic code table.)

5. Enhancers are transcriptional regulatory sequences that function by enhancing the activity of:

A. RNA polymerase at a single promoter site. B. RNA

polymerase at multiple promoter sites. C. spliceosomes and lariat formation in the ribosome. D. transcription factors that bind to the promoter but not to RNA

6. In the genetic code of human nuclear DNA, one of the codons specifying the amino acid tyrosine is UAC. If one nucleotide is changed and the codon is mutated to UAG, what type of mutation A. Silent mutation B. Missense mutation C. Nonsense mutation D. Frameshift mutation

7. Which of the following is NOT used by eukaryotes to increase the transcription of a gene? A. Gene duplication B. Histone acetylation C. DNA methylation

8. When trypsin converts chymotrypsinogen to chymotrypsin, some molecules of chymotrypsin bind to a repressor, which in turn binds to an operator region and prevents further transcription of trypsin. This is most similar to which of the following operons? A. trp operon during lack of tryptophan B. trp operon during abundance of tryptophan C. lac operon during lack of lactose D. lac operon during abundance of lactose

9. Which of the following RNA molecules or proteins is NOT found in the spliceosome during intron excision?

10. A 4-year-old toddler with cystic fibrosis (CF) is seen by his physician for an upper respiratory infection. Prior genetic testing has shown that there has been a deletion of three base pairs in exon 10 of the CFTR gene that affects codons 507 and 508. The nucleotide sequence in this region for normal and mutant alleles is shown below (X denotes the missing nucleotide):

Normal gene (coding strand)	Mutant gene (coding strand)
5'-GAG-XXX-GAG-3'	5'-GAG-GAG-3'

What effect will this mutation have on the amino acid sequence of the protein encoded by the CFTR gene? (Note: Refer to Figure 7.5 for a genetic code table.) A. Deletion of a phenylalanine residue with no change in the C-terminus B. Deletion of a leucine residue with no change in the C-terminus C. Deletion of a phenylalanine residue with a change in the C-terminus D. Deletion of a leucine residue with a change in the C-terminus

11. A gene encodes a protein with 150 amino acids. There is one intron of 1000 base pairs (bp), a 5'-untranslated region of 100 bp, and a 3'-untranslated region of 200 bp. In the final mRNA, about how many bases lie between the start AUG codon and final stop codon?

12. Peptidyl transferase connects the carboxylate group of one amino acid to the amino group of an incoming amino acid. What type of linkage is created in this peptide bond?

13. A eukaryotic cell has been found to exhibit a truncation mutation that

creates an inactive RNA polymerase I enzyme. Which type of RNA will be affected by this inactivation? 14. You have just sequenced a piece of DNA that reads as follows: What would the base sequence of the mRNA transcribed from this DNA be? 15. Double-stranded RNA cannot be translated by the ribosome and is marked for degradation in the cell. Which of the following strands of RNA would prevent mature mRNA in the cytoplasm from being translated? A. Identical mRNA to the one produced B. Antisense mRNA to the one produced C. mRNA with thymine substituted for uracil D. Sense mRNA to the one produced

RNA and the Genetic Code In This Chapter 7.1 The Genetic Code Types of RNA Mechanism of Transcription Mechanism of Translation 7.4 Control of Gene Expression in Prokaryotes 7.5 Control of Gene Expression in Eukaryotes Regulation of Chromatin Structure The content in this chapter should be relevant to about 9% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories: 1B: Transmission of genetic information from the gene to the protein 5D: Structure, function, and reactivity of biologically-relevant molecules

Hepatitis C virus (HCV) continues to be a major cause of cirrhosis and liver failure in the United States. Usually associated with intravenous drug use, hepatitis C causes ongoing damage and inflammation in the liver, leading to the formation of scar tissue that replaces the normal cells of the organ. Over time, this buildup of scar tissue makes the liver unable to keep up with the metabolic demands of the body, and liver failure ensues. To fight this virus, infected hepatocytes release interferon, a peptide signal that—as the name suggests—interferes with viral replication. Because viruses must hijack the host cell's machinery to replicate, one way the body can limit the spread of the virus is by shutting off the processes of transcription and translation. Interferon not only curtails these processes in virally infected cells, but also induces the production of RNase L, which cleaves RNA in cells to further reduce the ability of the virus to replicate. Coupled with other immune defenses, interferon thus serves as an efficient mechanism to protect the body from viral pathogens. Even in normal, healthy cells, the first step in expressing genetic information is transcription of the information in the base sequence of a double-stranded DNA molecule to form a

single-stranded molecule of RNA. The second step is translating that nucleotide sequence into a protein. Not every cell, though, expresses every gene product, and control of gene expression leads to the differentiation of the totipotent zygote into all of the tissues of the body. In this chapter, we will discuss the process through which proteins are produced along with the controls that modulate each step of the path.

### 7.1 The Genetic Code

After Chapter 7.1, you will be able to:

- Differentiate between three different types of RNA: mRNA, tRNA, and rRNA
- Transcribe a DNA sequence like "GAATTCG" into its mRNA conjugate
- Define the concepts of wobble and degeneracy
- Identify the translation outcomes of key codons, including AUG, UAG, UAA, and
- Predict the likely impact of different mutation types on the resulting peptide

An organism must be able to store and preserve its genetic information, pass that information along to future generations, and express that information as it carries out all the processes of life. We know that DNA and RNA share the same language: they both code using nitrogenous bases. Proteins, however, are composed of amino acids, which constitute a different language altogether. Therefore, we use the genetic code to translate this genetic information into proteins. While nucleotides play a crucial role in maintaining our genetic identity from generation to generation, it is the proteins they encode that help organisms develop and perform the necessary functions of life. The major steps involved in the transfer of genetic information are illustrated in the central dogma of molecular biology, as shown in Figure 7.1.

Classically, a gene is a unit of DNA that encodes a specific protein or RNA molecule, and through transcription and translation, that gene can be expressed. Although this sequence is now complicated by our increased knowledge of the ways in which genes and nucleic acids may be expressed, it is still useful as a general working definition of the processes of DNA replication, transcription, and translation. We have already discussed DNA synthesis, but will continue learning more about gene expression in the rest of this chapter.

### Figure 7.1 The Central Dogma of Molecular Biology

The relationship between the sequence found in double-stranded DNA, single-stranded RNA, and protein is illustrated in Figure 7.2 for a prototypical gene. Messenger RNA is synthesized in the 5' 3' direction and is complementary



and antiparallel to the DNA template strand. The ribosome translates the mRNA in the 5' 3' direction, as it synthesizes the protein from the amino terminus (N-terminus) to the carboxy terminus (C-terminus).

**Figure 7.2 Flow of Genetic Information from DNA to Protein**

**Types of RNA**

There are three main types of RNA found in cells: mRNA, tRNA, and rRNA. Each of the main types is described below, but regulatory and specialized forms of RNA are also described later in the chapter.

**mRNA is the messenger of genetic information.** DNA codes for proteins but cannot perform any of the important enzymatic reactions that proteins are responsible for in cells. mRNA takes the information from the DNA to the ribosomes, where creation of the primary protein begins.

**Messenger RNA (mRNA)** Messenger RNA (mRNA) carries the information specifying the amino acid sequence of the protein to the ribosome. mRNA is transcribed from template DNA strands by RNA polymerase enzymes in the nucleus of cells. Then, mRNA may undergo a host of posttranscriptional modifications prior to its release from the nucleus. mRNA is the only type of RNA that contains information that is translated into protein; to do so, it is read in three- nucleotide segments termed codons. In eukaryotes, mRNA is monocistronic, meaning that each mRNA molecule translates into only one protein product. Thus, in eukaryotes, the cell has a different mRNA molecule for each of the thousands of different proteins made by that cell. In prokaryotes, mRNA may be polycistronic, and starting the process of translation at different locations in the mRNA can result in different proteins. The process of creating mature mRNA will be discussed in the next section of this chapter.

**Transfer RNA (tRNA)** Transfer RNA (tRNA) is responsible for converting the language of nucleic acids to the language of amino acids and peptides. Each tRNA molecule contains a folded strand of RNA that includes a three-nucleotide anticodon, as shown in Figure 7.3. This anticodon recognizes and pairs with the appropriate codon on an mRNA molecule while in the ribosome. There are 20 amino acids in eukaryotic proteins, each of which is represented by at least one codon. To become part of a nascent polypeptide in the ribosome, amino acids are connected to a specific tRNA molecule; such tRNA molecules are said to be charged or activated with an amino acid, as shown in Figure 7.4. Mature tRNA is found in the cytoplasm.

**Figure 7.3 The Structure of**

tRNA Figure 7.4 Activation of Amino Acid for Protein Synthesis Each type of amino acid is activated by a different aminoacyl-tRNA synthetase that requires two high-energy bonds from ATP, implying that the attachment of the amino acid is an energy rich bond. The aminoacyl-tRNA synthetase transfers the activated amino acid to the 3' end of the correct tRNA. Each tRNA has a CCA nucleotide sequence where the amino acid binds. The high-energy aminoacyl-tRNA bond will be used to supply the energy needed to create a peptide bond during translation. Ribosomal RNA (rRNA) Ribosomal RNA (rRNA) is synthesized in the nucleolus and functions as an integral part of the ribosomal machinery used during protein assembly in the cytoplasm. Many rRNA molecules function as ribozymes; that is, enzymes made of RNA molecules instead of peptides. rRNA helps catalyze the formation of peptide bonds and is also important in splicing out its own introns within the nucleus. The complex structure of the ribosome is described later in this chapter. If a gene sequence is a "sentence" describing a protein, then its basic unit is a three-letter "word" known as the codon, which is translated into an amino acid. Genetic code tables, such as the one in Figure 7.5, serve as an easy way to determine the amino acid that is translated from each mRNA codon. Each codon consists of three bases; thus, there are 64 codons. Note how all codons are written in the 5' 3' direction, and the code is unambiguous, in that each codon is specific for one and only one amino acid. Figure 7.5 The Genetic Code Each codon represents only one amino acid; however, most amino acids are represented by multiple codons. Note that 61 of the codons code for one of the 20 amino acids, while three codons encode for the termination of translation. This code is universal across species (although there are some exceptions in the mitochondria that are not necessary to know for the MCAT). During translation, the codon of the mRNA is recognized by a complementary anticodon on a transfer RNA (tRNA). The anticodon sequence allows the tRNA to pair with the codon in the mRNA. Because base-pairing is involved, the orientation of this interaction will be antiparallel. For example, the aminoacyl tRNA Ile-tRNA<sup>Ile</sup> has an anticodon sequence 5'—GAU—3', allowing it to pair with the isoleucine codon 5'—AUC—3', as seen in Figure 7.6. Figure 7.6 Base Pairing of an Aminoacyl-tRNA with a Codon in

mRNA Every preprocessed eukaryotic protein starts with the exact same amino acid: methionine. Because every protein begins with methionine, the codon for methionine (AUG) is considered the start codon for translation of the mRNA into protein. There are also three codons that encode for termination of protein translation; there are no charged tRNA molecules that recognize these codons, which leads to the release of the protein from the ribosome. The three stop codons are UGA, UAA, and UAG. UAA—U Are Annoying UGA—U Go Away UAG—U Are Gone Degeneracy and Wobble The genetic code is degenerate because more than one codon can specify a single amino acid. In fact, all amino acids, except for methionine and tryptophan, are encoded by multiple codons. Referring back to Figure 7.5, we can see that for the amino acids with multiple codons, the first two bases are usually the same, and the third base in the codon is variable. We refer to this variable third base in the codon as the wobble position. Wobble is an evolutionary development designed to protect against mutations in the coding regions of our DNA. Mutations in the wobble position tend to be called silent or degenerate, which means there is no effect on the expression of the amino acid and therefore no adverse effects on the polypeptide sequence. The amino acid glycine, for example, requires that only the first two nucleotides of the codon be GG. The third nucleotide could be A, C, G, or U, and the amino acid composition of the protein would remain the same. The degeneracy of the genetic code allows for mutations in DNA that do not always result in altered protein structure or function. Usually, a mutation within an intron will also not change the protein sequence because introns are cleaved out of the mRNA transcript prior to translation.

Missense and Nonsense Mutations If a mutation occurs and it affects one of the nucleotides in a codon, it is known as a point mutation. Although we've already discussed the silent point mutation in the wobble position, other point mutations can have a severe detrimental effect depending on where the mutation occurs in the genome. Because these point mutations can affect the primary amino acid sequence of the protein, they are called expressed mutations. Expressed point mutations fall into two categories: missense and nonsense. Missense mutation—a mutation where one amino acid substitutes for another Nonsense mutation—a mutation

where the codon now encodes for a premature stop codon (also known as a truncation mutation) The three nucleotides of a codon are referred to as the reading frame. Point mutations occur when one nucleotide is changed, but a frameshift mutation occurs when some number of nucleotides are added to or deleted from the mRNA sequence. Insertion or deletion of nucleotides will shift the reading frame, usually resulting in changes in the amino acid sequence or premature truncation of the protein. The effects of frameshift mutations are typically more serious than point mutations, although it is heavily dependent on where within the DNA sequence the mutation actually occurred. A synopsis of the different types of mutations can be found in Figure 7.7

**Some Common Types of Mutations in DNA**

Cystic fibrosis is most commonly caused by a frameshift mutation: a deletion at codon 508 in the polypeptide chain of the CFTR chloride channel gene. The subsequent loss of a phenylalanine residue at this position results in a defective chloride ion channel. This altered protein never reaches the cell membrane, leading to blocked passage of salt and water into and out of cells. As a result of this blockage, cells that line the passageways of the lungs, pancreas, and other organs produce an abnormally thick, sticky mucus that traps bacteria, increasing the likelihood of infection in patients.

**MCAT CONCEPT CHECK 7.1** Before you move on, assess your understanding of the material with these questions.

1. What are the roles of the three main types of RNA?
2. The three-base sequences listed below are DNA sequences. Using Figure 7.5, which amino acid is encoded by each of these sequences, after transcription and
3. Which mRNA codon is the start codon, and what amino acid does it code for? Which mRNA codons are the stop codons? Start codon: \_\_\_\_\_; codes for: \_\_\_\_\_ Stop codons: \_\_\_\_\_
4. What is wobble, and what role does it serve?
5. For each of the mutations listed below, what changes in DNA sequence are observed, and what effect do they have on the encoded peptide?

Type of Mutation	Change in DNA Sequence	Effect on Encoded Protein	Type of Mutation	Change in DNA Sequence	Effect on Encoded Protein

After Chapter 7.2, you will be able to:

- Explain how each of the eukaryotic RNA polymerases (I, II, and III) impacts
- Identify where RNA polymerase would bind to start transcription on a DNA strand
- Determine the

mRNA that results from a given hnRNA molecule: Although DNA contains the actual coding sequence for a protein, the machinery to generate that protein is located in the cytoplasm. DNA cannot leave the nucleus, as it will be quickly degraded, so it must use RNA to transmit genetic information. The creation of mRNA from a DNA template is known as transcription, and while mRNA is the only type of RNA that carries information from DNA directly, there are many other types of RNA that exist, two of which will play important roles during protein translation: transfer RNA (tRNA) and ribosomal RNA (rRNA).

### Mechanism of Transcription

Transcription produces a copy of only one of the two strands of DNA. During initiation of transcription, several enzymes, including helicase and topoisomerase, are involved in unwinding the double-stranded DNA and preventing formation of supercoils, as described in Chapter 6 of MCAT Biochemistry Review. This step is important in allowing the transcriptional machinery access to the DNA and the particular gene of interest. Transcription results in a single strand of mRNA, synthesized from one of the two nucleotide strands of DNA called the template strand (or the antisense strand). The newly synthesized mRNA strand is both antiparallel and complementary to the DNA template strand. When we transcribe information, we use the same language to write it down (like in court, when the judge asks the court reporter to read back the transcript—the reporter speaks the same language as written). Translation is exactly what it says: we are changing the language. RNA translation changes the language from nucleotides to amino acids. RNA is synthesized by a DNA-dependent RNA polymerase; RNA polymerase locates genes by searching for specialized DNA regions known as promoter regions. In eukaryotes, RNA polymerase II is the main player in transcribing mRNA, and its binding site in the promoter region is known as the TATA box, named for its high concentration of thymine and adenine bases. Transcription factors help the RNA polymerase locate and bind to this promoter region of the DNA, helping to establish where transcription will start. Unlike DNA polymerase III, which we reviewed during DNA replication, RNA polymerase does not require a primer to start generating a

In eukaryotes, there are three types of RNA polymerases, but only one is involved in the transcription of mRNA: RNA

polymerase I is located in the nucleolus and synthesizes rRNA RNA polymerase II is located in the nucleus and synthesizes hnRNA (pre-processed mRNA) and some small nuclear RNA (snRNA) RNA polymerase III is located in the nucleus and synthesizes tRNA and some rRNA Transcription is subject to the 5' 3' rule, just like DNA synthesis. Synthesis of nucleic acids always occurs in the 5' 3' direction. RNA polymerase travels along the template strand in the 3' 5' direction, which allows for the construction of transcribed mRNA in the 5' 3' direction. Unlike DNA polymerase, RNA polymerase does not proofread its work, so the synthesized transcript will not be edited. The coding strand (or sense strand) of DNA is not used as a template during transcription. Because the coding strand is also complementary to the template strand, it is identical to the mRNA transcript except that all the thymine nucleotides in DNA have been replaced with uracil in the mRNA molecule. In the vicinity of a gene, a numbering system is used to identify the location of important bases in the DNA strand, as shown in Figure 7.8. The first base transcribed from DNA to RNA is defined as the +1 base of that gene region. Bases to the left of this start point (upstream, or toward the 5' end) are given negative numbers: -1, -2, -3, and so on. Bases to the right (downstream, or toward the 3' end) are denoted with positive numbers: +2, +3, +4, and so on. Thus, no nucleotide in the gene is numbered 0. The TATA box, where RNA polymerase II binds, usually falls around -25. Figure 7.8 Transcription of DNA to hnRNA Transcription will continue along the DNA coding region until the RNA polymerase reaches a termination sequence or stop signal, which results in the termination of transcription. The DNA double helix then re-forms, and the primary transcript formed is termed heterogeneous nuclear RNA (hnRNA). mRNA is derived from hnRNA via posttranscriptional modifications, as described below. The MCAT commonly tests post-transcriptional processing: 3' poly-A tail Before the hnRNA can leave the nucleus and be translated to protein, it must undergo three specific processes to allow it to interact with the ribosome and survive the conditions of the cytoplasm, as demonstrated in Figure 7.9. You can think of the nucleus as the happy home of the cell; the DNA strands are the caregivers, and the hnRNA is their child. The child must mature in order to survive. Figure 7.9 Processing

Eukaryotic hnRNA to Form mRNA Introns stay in the nucleus; exons will exit the nucleus as part of the mRNA. Splicing: Introns and Exons Maturation of the hnRNA includes splicing of the transcript to remove noncoding sequences (introns) and ligate coding sequences (exons) together. Splicing is accomplished by the spliceosome. In the spliceosome, small nuclear RNA (snRNA) molecules couple with proteins known as small nuclear ribonucleoproteins (also known as snRNPs, or “snurps”). The snRNP/snRNA complex recognizes both the 5′ and 3′ splice sites of the introns. These noncoding sequences are excised in the form of a lariat (lasso-shaped structure) and then degraded. The evolutionary function of introns in eukaryotic cells is not currently well- understood; however, scientists hypothesize that introns play an important role in the regulation of cellular gene expression levels and in maintaining the size of our genome. The existence of introns has also been hypothesized to allow for rapid protein evolution. Many eukaryotic proteins share peptide sequences in common, suggesting that the genes encoding for these particular peptides may employ a modular function; that is, they contain standard sequences that can be swapped in and out, depending on the needs of the cell. At the 5′ end of the hnRNA molecule, a 7-methylguanylate triphosphate cap is added. The cap is actually added during the process of transcription and is recognized by the ribosome as the binding site. It also protects the mRNA from degradation in the cytoplasm. 3′ Poly-A Tail A polyadenosyl (poly-A) tail is added to the 3′ end of the mRNA transcript and protects the message against rapid degradation. It is composed of adenine bases. Think of the poly-A tail as a fuse for a “time bomb” for the mRNA transcript: as soon as the mRNA leaves the nucleus, it will start to get degraded from its 3′ end. The longer the poly-A tail, the more time the mRNA will be able to survive before being digested in the cytoplasm. The poly-A tail also assists with export of the mature mRNA from the nucleus. At this point, when only the exons remain and the cap and tail have been added, the cell has created the mature mRNA that can now be transported into the cytoplasm for protein translation. Untranslated regions of the mRNA (UTRs) will still exist at the 5′ and 3′ edges of the transcript because the ribosome initiates translation at the start codon (AUG) and will end at a stop codon (UAA, UGA, UAG). Mutations

in splice sites can lead to abnormal proteins. For example, mutations that interfere with proper splicing of  $\beta$ -globulin mRNA are responsible for some cases of  $\beta$ -thalassemia, a group of blood disorders that hinder the production and efficacy of hemoglobin in the blood. Splice site mutations are one of the few mutations in noncoding DNA that may still have an effect on the translated protein. For some genes in eukaryotic cells, however, the primary transcript of hnRNA may be spliced together in different ways to produce multiple variants of proteins encoded by the same original gene. This process is known as alternative splicing, and it is illustrated in Figure 7.10. By utilizing alternative splicing, an organism can make many more different proteins from a limited number of genes. For reference, humans are estimated to make at least 100,000 proteins, but the number of human genes is only about 20,000–25,000. Don't worry about memorizing these numbers, though; they are constantly changing with new research. Alternative splicing is also known to function in the regulation of gene expression, in addition to generating protein diversity.

Figure 7.10 Alternative Splicing of Eukaryotic hnRNA to Produce Different

MCAT CONCEPT CHECK 7.2 Before you move on, assess your understanding of the material with these questions.

1. What is the role of each eukaryotic RNA polymerase? RNA polymerase I: RNA polymerase II: RNA polymerase III:
2. When starting transcription, where does RNA polymerase bind?
3. What are the three major posttranscriptional modifications that turn hnRNA into
4. What is alternative splicing, and what does it accomplish?

After Chapter 7.3, you will be able to:

- Describe the steps of translation: initiation, elongation, and termination
- Distinguish different types of posttranslational modifications, such as phosphorylation and glycosylation
- Explain the role of the functional sites in a ribosome: Once the mRNA transcript is created and processed, it can exit the nucleus through nuclear pores. Once in the cytoplasm, mRNA finds a ribosome to begin the process of translation—converting the mRNA transcript into a functional protein. Translation is a complex process that requires mRNA, tRNA, ribosomes, amino acids, and energy in the form of GTP. As mentioned earlier, the anticodon of the tRNA binds to the codon on the mature mRNA in the ribosome. The ribosome is composed of proteins and rRNA. In



both prokaryotes and eukaryotes, there are large and small subunits; the subunits only bind together during protein synthesis. The structure of the ribosome dictates its main function, which is to bring the mRNA message together with the charged aminoacyl-tRNA complex to generate the protein. There are three binding sites in the ribosome for tRNA: the A site (aminoacyl), P site (peptidyl), and E site (exit). These are described further in the section on translation below.

**Terminology and 5' 3' DNA** DNA = replication: new DNA synthesized in 5' 3' direction DNA RNA = transcription: new RNA synthesized in 5' 3' direction (template is read 3' 5') RNA protein = translation: mRNA read in 5' 3' direction

Eukaryotic ribosomes contain four strands of rRNA, designated the 28S, 18S, 5.8S, and the 5S rRNAs; the "S" values indicate the size of the strand. The genes for some of the rRNAs (28S, 18S, and 5.8S rRNAs) used to construct the ribosome are found in the nucleolus. RNA polymerase I transcribes the 28S, 18S, and 5.8S rRNAs as a single unit within the nucleolus, which results in a 45S ribosomal precursor RNA. This 45S pre- rRNA is processed to become the 18S rRNA of the 40S (small) ribosomal subunit and the 28S and 5.8S rRNAs of the 60S (large) ribosomal subunit. RNA polymerase III transcribes the 5S rRNA, which is also found in the 60S ribosomal subunit; this process takes place outside of the nucleolus. The ribosomal subunits created are the 60S and 40S subunits; these subunits join during protein synthesis to form the whole 80S ribosome. The fact that prokaryotic and eukaryotic ribosomes have slightly different structures is no small fact. This difference allows us to target antibiotics, like macrolides (azithromycin, erythromycin), tetracyclines (doxycycline), vancomycin, and others to bacterial cells with fewer side effects to humans. In comparison with eukaryotes, prokaryotes have 50S and 30S large and small subunits, which assemble to create the complete 70S ribosome. Note that the "S" value is determined experimentally by studying the behavior of particles in a ultracentrifuge; thus, the numbers of each subunit and each rRNA are not additive because they are based on size and shape, not size alone. The structure of eukaryotic and prokaryotic ribosomes are shown in Figure 7.11

**The Composition of Prokaryotic and Eukaryotic Ribosomes**

**Mechanism of Translation** Translation occurs in the cytoplasm in prokaryotes and eukaryotes. In

prokaryotes, the ribosomes start translating before the mRNA is complete; in eukaryotes, however, transcription and translation occur at separate times and in separate locations within the cell. The process of translation occurs in three stages, as shown in Figure 7.12: initiation, elongation, and termination. Specialized factors for initiation (initiation factors, IF), elongation (elongation factors, EF), and termination (release factors, RF), as well as GTP are required for each step.

**Figure 7.12. Steps in Translation**

The small ribosomal subunit binds to the mRNA. In prokaryotes, the small subunit binds to the Shine–Dalgarno sequence in the 5′ untranslated region of the mRNA. In eukaryotes, the small subunit binds to the 5′ cap structure. The charged initiator tRNA binds to the AUG start codon through base-pairing with its anticodon within the P site of the ribosome. The initial amino acid in prokaryotes is N-formylmethionine (fMet); in eukaryotes, it's methionine. The large subunit then binds to the small subunit, forming the completed initiation complex. This is assisted by initiation factors (IF) that are not permanently associated with the ribosome.

Elongation is a three-step cycle that is repeated for each amino acid added to the protein after the initiator methionine. During elongation, the ribosome moves in the 5′ to 3′ direction along the mRNA, synthesizing the protein from its amino (N-) to carboxyl (C-) terminus. The ribosome contains three very important binding sites: The A site holds the incoming aminoacyl-tRNA complex. This is the next amino acid that is being added to the growing chain, and is determined by the mRNA codon within the A site. The P site holds the tRNA that carries the growing polypeptide chain. It is also where the first amino acid (methionine) binds because it is starting the polypeptide chain. A peptide bond is formed as the polypeptide is passed from the tRNA in the P site to the tRNA in the A site. This requires peptidyl transferase, an enzyme that is part of the large subunit. GTP is used for energy during the formation of this bond.

The E site (not shown in Figure 7.12) is where the now inactivated (uncharged) tRNA pauses transiently before exiting the ribosome. As the now-uncharged tRNA enters the E site, it quickly unbinds from the mRNA and is ready to be recharged. Order of sites in the ribosome during translation: APE.

Elongation factors (EF) assist by locating and recruiting aminoacyl-tRNA along with GTP, while

helping to remove GDP once the energy has been Some eukaryotic proteins contain signal sequences, which designate a particular destination for the protein, as shown in Figure 7.13. For peptides that will be secreted, such as hormones and digestive enzymes, a signal sequence directs the ribosome to move to the endoplasmic reticulum (ER), so that the protein can be translated directly into the lumen of the rough ER. From there, the protein can be sent to the Golgi apparatus and be secreted from a vesicle via exocytosis. Other signal sequences direct proteins to the nucleus, lysosomes, or cell membrane.

**Figure 7.13 Synthesis of Secretory, Membrane, and Lysosomal Proteins**

When any of the three stop codons moves into the A site, a protein called release factor (RF) binds to the termination codon, causing a water molecule to be added to the polypeptide chain. The addition of this water molecule allows peptidyl transferase and termination factors to hydrolyze the completed polypeptide chain from the final tRNA. The polypeptide chain will then be released from the tRNA in the P site, and the two ribosomal subunits will dissociate. The nascent polypeptide chain is subject to posttranslational modifications before it will become a functioning protein, similar to how hnRNA is modified prior to being released from the nucleus. One essential step for the final synthesis of the protein is proper folding. There is a specialized class of proteins called chaperones, the main function of which is to assist in the

Many proteins are also modified by cleavage events. A common example of this is insulin, which needs to be cleaved from a larger, inactive peptide to achieve its active form. In peptides with signal sequences, the signal sequence must be cleaved if the protein is to enter the organelle and accomplish its function. In peptides with quaternary structure, subunits come together to form the functional protein. A classic example is hemoglobin, which is composed of two alpha chains and two beta chains. Other biomolecules may be added to the peptide via the following processes: Posttranslational modifications are often important for proper protein functioning. For example, several clotting factors, including prothrombin, require posttranslational carboxylation of some of their glutamic acid residues in order to function properly. Vitamin K is required as a cofactor for these reactions; thus, vitamin K deficiency may result in a

Phosphorylation—addition of a phosphate group ( $\text{PO}_4^{2-}$ ) by protein kinases to activate or deactivate proteins; phosphorylation in eukaryotes is most commonly seen with serine, threonine, and tyrosine. Carboxylation—addition of carboxylic acid groups, usually to serve as calcium-binding sites. Glycosylation—addition of oligosaccharides as proteins pass through the ER and Golgi apparatus to determine cellular destination. Prenylation—addition of lipid groups to certain membrane-bound proteins.

**BIOCHEMISTRY GUIDED EXAMPLE WITH EXPERT**

**Profilins (Pfn)** are a family of actin-monomer binding proteins that strongly inhibit spontaneous elongation of pointed ends of actin filaments, but promote barbed-ended elongation through the addition of ATP-bound monomeric actin. Since actin polymerization is a fundamental component of many physiological properties, the goal of this study is to elucidate the regulation of Pfn1 (the most abundant isoform of Pfn in mammals) by phosphorylation.

**Intro to topic: Pfn regulation of Pfn1**

Pfn1 is known to be phosphorylated on tyrosine and serine residues. Using sequence analysis software, threonine-89 was also identified as a possible phosphorylation site by protein kinase A (PKA). To examine the role of threonine-89 in Pfn1 expression, two Pfn1 constructs were created—T89D and T89A. Human embryonic kidney cells (HEK-293) expressing indicated green fluorescent protein-fused Pfn1 (GFP Pfn1) constructs (GFP Pfn1 T89D, T89A, and wild-type) were lysed with either non-denaturing (containing 1% NP-40) or denaturing (containing 1% NP-40, 2% SDS as a mild denaturant for one buffer, and the other with 6 M urea as a strong denaturant in addition) extraction buffers. Misfolded proteins are generally insoluble unless some denaturant is present. HEK-293 lysates were subject to a western blot, where lysates were immunoblotted with anti-tubulin antibody as a loading control, anti-GFP antibody, and anti-Pfn1 antibody specific for endogenous Pfn1. T89D and T89A mutants made to analyze role of Pfn1.

Cells expressing the 3 constructs were broken apart with one of 3 types of solutions: non-, mild, or strong denaturing. Ignore the results for tubulin; it's just a loading control. This will show if any of the constructs are phosphorylated. This will show the Pfn1 that's already expressed in the cells. Lots of info here, so focus on what's changing: the GFP row shows the most change so it's probably the most accurate.

Adapted from Gau, D., Veon, W., Zeng, X., Yates, N., Shroff, S. G., Koes, D. R.,

& Roy, P. (2016). Threonine 89 is an important residue of profilin-1 that is phosphorylatable by protein kinase A. What is the purpose of mutating the potential phosphorylation site to aspartic acid and alanine, respectively? What is the implication for expression of Since the question is asking for a reason behind the experimental design, our focus should be on understanding the way the experiment was designed. The passage is focused on clarifying how phosphorylation regulates Pfn1. We know from our content background that phosphorylation of an amino acid (specifically serine, threonine, and tyrosine) will turn a polar amino acid into one that is negatively charged. If we didn't remember that, we could also infer it by thinking about the charge on a phosphate group, which is highly negative. We have enough information to answer the first question. Mutating a threonine phosphorylation site to aspartic acid (which is negatively charged) would mimic the site being constantly phosphorylated, while mutating to alanine would mimic the site being constantly dephosphorylated, since alanine residues cannot be One possible phosphorylation site, T89, was identified, and three GFP constructs were made—one mimicking phosphorylation (T89D, lanes 1–3), one eliminating phosphorylation (T89A, lanes 4–6), and one unmodified (lanes 7–9). The GFP tag allows the experimenters to see whether the GFP-fused construct is being expressed (whether the protein is being made). We're told this experimental procedure is a western blot, a technique in which a specific antibody of interest will bind to proteins that were separated on a gel. In western blots, a band appears when the antibody successfully binds to protein. The rows above the gel image display experimental conditions for each of the lanes. All lanes have 1% NP-40, which we're told is non-denaturing. We should recall that the word denaturing means that a substance changes the 3-D structure of a protein. So, non-denaturing means that NP-40 won't change the shape of the protein by itself. The lanes with 2% SDS are in mild denaturing conditions, and the lanes with 2% SDS and 6 M urea are in strong denaturing conditions. Continuing by that same definition, we know that strong denaturing conditions will unfold and solubilize all proteins, greatly changing their 3-D structure. If we look at the row probing for GFP, we see that there is no band for non- and

mild denaturing conditions, but there is a faint band under strong denaturing conditions for only the T89D construct. We can see that the lanes for both the wild type and T89A, regardless of condition, are mostly the same. Finally, recall that phosphorylation is a post-translational event, so a change in the phosphorylation state of the protein would occur after Pfn1 has been translated, and wouldn't work to affect its expression. Therefore, we can conclude that mutating the threonine residue can mimic the effect of constantly phosphorylated or dephosphorylated Pfn. Second, since we only see a GFP band when T89D is in the presence of a strong denaturant, phosphorylation of Pfn1 may cause the protein to fold in a way that makes it insoluble, thereby targeting the protein for degradation. Follow-up studies are required to verify the exact mechanism of action by which this occurs. Therefore, because T89D represents the "always phosphorylated" version of Pfn1, and T89D only appears on the gel in strongly denaturing conditions, we can conclude that Pfn1, when phosphorylated, isn't available/expressed. We can thus conclude that phosphorylation of Pfn1 can potentially be used to down-regulate the availability of Pfn1 for usage with actin MCAT CONCEPT CHECK 7.3

Before you move on, assess your understanding of the material with these questions. 1. What are the three steps of translation? 2. What are the roles of each site in the ribosome? 3. What are the major posttranslational modifications that occur in proteins? 7.4 Control of Gene Expression

After Chapter 7.4, you will be able to: Recognize the transcriptional controls on key operons such as the lac and trp Differentiate between positive and negative control systems Explain the role of the different sections of a standard operon An organism's DNA encodes all of the RNA and protein molecules required to construct its cells. Yet organisms are able to differentially express their genes to make cell-specific products necessary for cellular development at specific times. In the next section, we'll look at these processes in eukaryotic cells; for now, we'll focus on the regulatory processes governing gene expression in prokaryotes—rules that are necessary in determining which subset of genes are selectively expressed or silenced in the prokaryotic cell. The simplest example of an on-off switch that regulates gene expression levels in prokaryotes was discovered in *E. coli*, which regulates the

expression of many genes according to food sources that are available in the environment. For example, five genes in *E. coli* encode for enzymes that manufacture the amino acid tryptophan, and these are arranged in a cluster on the chromosome. By sharing a single common promoter region on the DNA sequence, these genes are transcribed as a group. This type of structure is called an operon—a cluster of genes transcribed as a single mRNA; this particular cluster in *E. coli* is known as the *trp* operon. Operons are incredibly common in the prokaryotic cell. The Jacob–Monod model is used to describe the structure and function of operons. In this model, operons contain structural genes, an operator site, a promoter site, and a regulator gene, as shown in Figure 7.14. The structural gene codes for the protein of interest. Upstream of the structural gene is the operator site, a nontranscribable region of DNA that is capable of binding a repressor protein. Further upstream is the promoter site, which is similar in function to promoters in eukaryotes: it provides a place for RNA polymerase to bind. Furthest upstream is the regulator gene, which codes for a protein known as the repressor. There are two types of operons: inducible systems and repressible systems. Figure 7.14 Inducible Systems Allow for gene transcription only when an inducer is present to bind the otherwise present repressor protein. Operons include both inducible and repressible systems, and offer a simple on–off switch for gene control in prokaryotes. In inducible systems, the repressor is bonded tightly to the operator system and thereby acts as a roadblock. RNA polymerase is unable to get from the promoter to the structural gene because the repressor is in the way. Such systems—in which the binding of a protein reduces transcriptional activity—are called negative control mechanisms. To remove that block, an inducer must bind the repressor protein so that RNA polymerase can move down the gene, as shown in Figure 7.14. Inducible systems operate on a principle analogous to competitive inhibition for enzyme activity: as the concentration of the inducer increases, it will pull more copies of the repressor off of the operator region, freeing up those genes for transcription. This system is useful because it allows gene products to be produced only when they are needed. Negative control—The binding of a protein to DNA stops transcription. Positive

control—The binding of a protein to DNA increases transcription. Inducible system—The system is normally “off” but can be made to turn “on,” given a Repressible system—The system is normally “on” but can be made to turn “off,” given a Any combination of control and system are possible; the lac operon is a negative inducible system whereas the trp operon is a negative repressible system. A classic example of an inducible system is the lac operon, which contains the gene for lactase, as demonstrated in Figure 7.15. Bacteria can digest lactose, but it is more energetically expensive than digesting glucose. Therefore, bacteria only want to use this option if lactose is high and glucose is low. The lac operon is induced by the presence of lactose; thus, these genes are only transcribed when it is useful to the cell. Figure 7.15 The lac Operon An example of an inducible system The lac operon is assisted by binding of the catabolite activator protein (CAP). CAP is a transcriptional activator used by E. coli when glucose levels are low to signal that alternative carbon sources should be used. Falling levels of glucose cause an increase in the signaling molecule cyclic AMP (cAMP), which binds to CAP. This induces a conformational change in CAP that allows it to bind the promoter region of the operon, further increasing transcription of the lactase gene. Such systems—in which the binding of a molecule increases transcription of a gene—are called positive control Repressible systems allow constant production of a protein product. In contrast to the inducible system, the repressor made by the regulator gene is inactive until it binds to a corepressor. This complex then binds the operator site to prevent further transcription, as shown in Figure 7.16. Repressible systems tend to serve as negative feedback; often, the final structural product can serve as a corepressor. Thus, as its levels increase, it can bind the repressor, and the complex will attach to the operator region to prevent further transcription of the same gene. Figure 7.16 Repressible Systems Continually allow gene transcription unless a corepressor binds to the repressor to stop transcription The trp operon, described above, operates in this way as a negative repressible system. When tryptophan is high in the local environment, it acts as a corepressor. The binding of two molecules of tryptophan to the repressor causes the repressor to bind to the operator site. Thus, the cell turns off its



machinery to synthesize its own tryptophan, which is an energetically expensive process because of its easy availability in the MCAT CONCEPT CHECK 7.4 Before you move on, assess your understanding of the material with these questions. 1. What type of operon is the trp operon? The lac operon? 2. From 5' to 3', what are the components of the operon, and what are their roles? 3. What is a positive control system? What is a negative control system? Positive control system: Negative control system: 7.5 Control of Gene Expression in After Chapter 7.5, you will be able to: Identify the different mechanisms that can be used to regulate or amplify the expression of a gene Predict how histone and DNA modification will affect the ratio of heterochromatin to Genomic expression in eukaryotes is considerably more complex than in prokaryotes, and you will need to know those differences for Test Day. Regulation of gene expression is an essential feature that helps in maintaining the overall functionality of cells. In addition to basic transcriptional enzymes, however, there are a host of other regulatory proteins that play a prominent role in controlling gene expression levels in Transcription factors are transcription-activating proteins that search the DNA looking for specific DNA-binding motifs. Transcription factors tend to have two recognizable domains: a DNA-binding domain and an activation domain. The DNA-binding domain binds to a specific nucleotide sequence in the promoter region or to a DNA response element (a sequence of DNA that binds only to specific transcription factors) to help in the recruitment of transcriptional machinery. The activation domain allows for the binding of several transcription factors and other important regulatory proteins, such as RNA polymerase and histone acetylases, which function in the remodeling of the chromatin structure. The DNA regulatory base sequences (such as promoters, enhancers, and response elements) are known as cis regulators because they are in the same vicinity as the gene they control. Transcription factors, however, have to be produced and translocated back to the nucleus; thus they are called trans regulators because they travel through the cell to their point of action. Once the transcription complex is formed, basal (or low-level) transcription can begin and maintain moderate, but adequate, levels of the protein encoded by this gene in the cell.

There are times, however, when the expression must be increased, or amplified, in response to specific signals such as hormones, growth factors, and other intracellular conditions. Eukaryotic cells accomplish this through enhancers and gene duplication. Response elements outside the normal promoter regions can be recognized by specific transcription factors to enhance transcription levels. Several response elements may be grouped together to form an enhancer, which allows for the control of one gene's expression by multiple signals. Figure 7.17 demonstrates a eukaryotic example of an enhancer. Signal molecules, such as cyclic AMP (cAMP), cortisol, and estrogen, bind to specific receptors. For the examples given, these receptors are cyclic AMP response element-binding protein (CREB), the glucocorticoid (cortisol) receptor, and the estrogen receptor, respectively; all are transcription factors that bind to their respective response elements within the enhancer. Other proteins are involved in this process, but are outside the scope of the MCAT. Note that the large distance between the enhancer and promoter regions for a given gene means that DNA often must bend into a hairpin loop to bring these elements together spatially. Figure 7.17 Stimulation of Transcription by an Enhancer and Its Associated Enhancer regions in the DNA can be up to 1000 base pairs away from the gene they regulate and can even be located within an intron, or noncoding region, of the gene. They differ from upstream promoter elements in their locations because upstream promoter elements must be within 25 bases of the start of a gene. By utilizing enhancer regions, genes have an increased likelihood to be amplified because of the variety of signals that can increase Cells can also increase the expression of a gene product by duplicating the relevant gene. Genes can be duplicated in series on the same chromosome, yielding many copies in a row of the same genetic information. Genes can also be duplicated in parallel by opening the gene with helicases and permitting DNA replication only of that gene; cells can continue replicating the gene until hundreds of copies of the gene exist in parallel on the same Regulation of Chromatin Structure In eukaryotic cells, DNA is packaged in the nucleus as chromatin, which requires chromatin remodeling to allow transcription factors and the transcriptional machinery easier access to the DNA.

Heterochromatin is tightly coiled DNA that appears dark under the microscope; its tight coiling makes it inaccessible to the transcription machinery, so these genes are inactive. Euchromatin, on the other hand, is looser and appears light under the microscope; the transcription machinery can access the genes of interest, so these genes are active. Remodeling of the chromatin structures regulates gene expression levels in the cell. Transcription factors that bind to the DNA can recruit other coactivators such as histone acetylases. These proteins are involved in chromatin remodeling, as shown in Figure 7.18, because they acetylate lysine residues found in the amino terminal tail regions of histone proteins. Acetylation of histone proteins decreases the positive charge on lysine residues and weakens the interaction of the histone with DNA, resulting in an open chromatin conformation that allows for easier access of the transcriptional machinery to the DNA. Figure 7.18 Chromatin Remodeling by Acetylation Increases space between histones, allowing better access to DNA for transcription factors Specific patterns of histone acetylation can lead to increased gene expression levels. On the other hand, gene silencing can occur just as easily with chromatin remodeling. Histone deacetylases are proteins that function to remove acetyl groups from histones, which results in a closed chromatin conformation and overall decrease in gene expression levels in the cell. DNA methylation is also involved in chromatin remodeling and regulation of gene expression levels in the cell. DNA methylases add methyl groups to cytosine and adenine nucleotides; methylation of genes is often linked with the silencing of gene expression. During development, methylation plays an important role in silencing genes that no longer need to be activated. Heterochromatin regions of the DNA are much more heavily methylated, hindering access of the transcriptional machinery to the DNA. MCAT

**CONCEPT CHECK 7.5** Before you move on, assess your understanding of the material with these questions. 1. In an enhancer, what are the differences between signal molecules, transcription factors, and response elements? 2. By what histone and DNA modifications can genes be silenced in eukaryotic cells? Would these processes increase the proportion of heterochromatin or euchromatin? To carry out the functions of life, we must produce around

100,000 different proteins using our 20,000–25,000 available genes. Every protein in the biosphere is produced through the central dogma of molecular biology, as genes in DNA are transcribed into mRNA and then translated into a functional protein. This is a complex, highly regulated process in both prokaryotes and eukaryotes, and questions on transcription and translation, and their regulation, are frequent on the MCAT. The last two chapters focused on the important roles played by many organelles in the cell, including the nucleus, nucleolus, ribosome, rough endoplasmic reticulum, and Golgi apparatus. After secreted proteins such as hormones and digestive enzymes are produced, they make their way to the plasma membrane for exocytosis. It is this last stop that we'll examine in the next chapter: the structure, function, and biochemistry of biological You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources!

**The Genetic Code** The central dogma states that DNA is transcribed to RNA, which is translated to protein. A degenerate code allows multiple codons to encode for the same

**Initiation (start) codon:** AUG **Termination (stop) codons:** UAA, UGA, UAG **Redundancy and wobble** (third base in the codon) allows mutations to occur without effects in the protein. **Point mutations** can cause: **Silent mutations** with no effect on protein synthesis. **Nonsense (truncation) mutations** that produce a premature stop **Missense mutations** that produce a codon that codes for a different **Frameshift mutations** result from nucleotide addition or deletion, and change the reading frame of subsequent codons. RNA is structurally similar to DNA except: **Substitution of a ribose sugar for deoxyribose** **Substitution of uracil for thymine** It is single-stranded instead of double-stranded There are three types of RNA with separate jobs in transcription: **Messenger RNA (mRNA)** carries the message from DNA in the nucleus via transcription of the gene; it travels into the cytoplasm to **Transfer RNA (tRNA)** brings in amino acids and recognizes the codon on the mRNA using its anticodon. **Ribosomal RNA (rRNA)** makes up the ribosome and is **Helicase** unwinds the DNA double helix. **RNA polymerase II** binds to the TATA box within the promoter region of the gene (25 base pairs upstream from first transcribed **hnRNA** is synthesized from the DNA template (antisense) strand.

Posttranscriptional modifications include: A 7-methylguanylate triphosphate cap is added to the 5' end. A polyadenosyl (poly-A) tail is added to the 3' end. Splicing is done by snRNA and snRNPs in the spliceosome; introns are removed in a lariat structure, and exons are ligated together. Prokaryotic cells can increase the variability of gene products from one transcript through polycistronic genes (in which starting transcription in different sites within the gene leads to different Eukaryotic cells can increase variability of gene products through alternative splicing (combining different exons in a modular fashion to acquire different gene products). tRNA translates the codon into the correct amino acid. Ribosomes are the factories where translation (protein synthesis) There are three stages of translation. Initiation in prokaryotes occurs when the 30S ribosome attaches to the Shine-Dalgarno sequence and scans for a start codon; it lays down N-formylmethionine in the P site of the ribosome. Initiation in eukaryotes occurs when the 40S ribosome attaches to the 5' cap and scans for a start codon; it lays down methionine in the P site of the ribosome. Elongation involves the addition of a new aminoacyl-tRNA into the A site of the ribosome and transfer of the growing polypeptide chain from the tRNA in the P site to the tRNA in the A site. The now uncharged tRNA pauses in the E site before exiting the Termination occurs when the codon in the A site is a stop codon; a release factor places a water molecule on the polypeptide chain and thus releases the protein. Initiation, elongation, and release factors help with each step in recruitment and assembly/disassembly of the ribosome. Posttranslational modifications include: Folding by chaperones Formation of quaternary structure Cleavage of proteins or signal sequences Covalent addition of other biomolecules (phosphorylation, carboxylation, glycosylation, prenylation) Control of Gene Expression in Prokaryotes The Jacob-Monod model of repressors and activators explains how Operons are inducible or repressible clusters of genes transcribed as a single mRNA. Inducible systems (such as the lac operon) are bonded to a repressor under normal conditions; they can be turned on by an inducer pulling the repressor from the operator site. Repressible systems (such as the trp operon) are transcribed under normal conditions; they can be turned off by a corepressor coupling with the repressor and the

binding of this complex to the operator

### Control of Gene Expression in Eukaryotes

Transcription factors search for promoter and enhancer regions in Promoters are within 25 base pairs of the transcription start site. Enhancers are more than 25 base pairs away from the transcription

### Modification of chromatin structure affects the ability of transcriptional enzymes to access the DNA through histone acetylation (increases accessibility) or DNA methylation (decreases

### Answers to Concept Checks

1. mRNA carries information from DNA by traveling from the nucleus (where it is transcribed) to the cytoplasm (where it is translated). tRNA translates nucleic acids to amino acids by pairing its anticodon with mRNA codons; it is charged with an amino acid, which can be added to the growing peptide chain. rRNA forms much of the structural and catalytic component of the ribosome, and acts as a ribozyme to create peptide bonds between amino acids.
2. • GAT: mRNA codon = AUC; Isoleucine (Ile) ATT: mRNA codon = AAU; Asparagine (Asn) CGC: mRNA codon = GCG; Alanine (Ala) CCA: mRNA codon = UGG; Tryptophan (Trp)
3. The start codon is AUG, which codes for methionine; the stop codons are UAA, UGA, and UAG.
4. Wobble refers to the fact that the third base in a codon often plays no role in determining which amino acid is translated from that codon. For example, any codon starting with "CC" codes for proline, regardless of which base is in the third (wobble) position. This is protective because mutations in the wobble position will not have any effect on the protein translated from that gene.

### Change in DNA Sequence Effect on Encoded Protein

Substitution of bases in the wobble position, introns, or No change observed

Substitution of one base, creating an mRNA codon that matches a different amino acid One amino acid is changed in the protein; variable effects on function depending on

Substitution of one base, creating a stop codon Early truncation of protein; variable effects on function, but usually more severe than missense mutations

Insertion or deletion of bases, creating a shift in the reading frame of the mRNA Change in most amino acids after the site of insertion or deletion; usually the most severe of the types listed here
- 1. RNA polymerase I synthesizes most rRNA. RNA polymerase II synthesizes mRNA (hnRNA) and snRNA. RNA polymerase III synthesizes tRNA and some rRNA.
- 2. RNA polymerase II binds to the TATA box, which is

located within the promoter region of a relevant gene, at about 25. 3. The major posttranscriptional modifications are: Splicing: removal of introns, joining of exons; uses snRNA and snRNPs in the spliceosome to create a lariat, which is then degraded; exons are ligated together 5' cap: addition of a 7-methylguanylate triphosphate cap to the 5' end of the transcript 3' poly-A tail: addition of adenosine bases to the 3' end to protect 4. Alternative splicing is the ability of some genes to use various combinations of exons to create multiple proteins from one hnRNA transcript. This increases protein diversity and allows a species to maximize the number of proteins it can create from a limited number of 1. Initiation, elongation, and termination 2. A site: binds incoming aminoacyl-tRNA using codon-anticodon P site: holds growing polypeptide until peptidyl transferase forms peptide bond and polypeptide is handed to A site E site: transiently holds uncharged tRNA as it exits the ribosome 3. Posttranslational modifications include proper folding by chaperones, formation of quaternary structure, cleavage of proteins or signal sequences, and addition of other biomolecules (phosphorylation, carboxylation, glycosylation, prenylation). 1. The trp operon is a negative repressible system; the lac operon is a negative inducible system. Transcribed to form repressor protein Site of RNA polymerase binding (similar to promoters in eukaryotes) Binding site for repressor protein The gene of interest; its transcription is dependent on the repressor being absent from the operator site 3. Positive control systems require the binding of a protein to the operator site to increase transcription. Negative control systems require the binding of a protein to the operator site to decrease transcription. 1. Signal molecules include steroid hormones and second messengers, which bind to their receptors in the nucleus. These receptors are transcription factors that use their DNA-binding domain to attach to a particular sequence in DNA called a response element. Once bonded to the response element, these transcription factors can then promote increased expression of the relevant gene. 2. Histone deacetylation and DNA methylation will both downregulate the transcription of a gene. These processes allow the relevant DNA to be clumped more tightly, increasing the proportion of heterochromatin. Science Mastery Assessment Peptidyl

transferase is an enzyme that catalyzes the formation of a peptide bond between the incoming amino acid in the A site and the growing polypeptide chain in the P site. Initiation and elongation factors help transport charged tRNA molecules into the ribosome and advance the ribosome down the mRNA transcript, as in (A) and (B). Chaperones maintain a protein's three-dimensional shape as it is formed, as in (C). The promoter functions as a recruitment site for RNA polymerase and is required for gene expression. A mutation in this region would hinder RNA polymerase recruitment, resulting in a decrease in gene expression. These observations support (C) as the correct answer. By contrast, mutations in the operator and regulatory genes would render the repressor less able to block transcription, leading to the opposite effect, i.e. an increase in lactase expression. This result eliminates both (A) and (B). Finally, mutations in the structural genes could lead to the production of a nonfunctional enzyme, but are unlikely to affect gene expression, eliminating (D).

Topoisomerases, such as prokaryotic DNA gyrase, are involved in DNA replication and mRNA synthesis (transcription). DNA gyrase is a type of topoisomerase that enhances the action of helicase enzymes by the introduction of negative supercoils into the DNA molecule. These negative supercoils facilitate DNA replication by keeping the strands separated and

There are four different codons for valine: GUU, GUC, GUA, and GUG. Through base-pairing, we can determine that the proper anticodon must end with "AC." Remember that the codon and anticodon are antiparallel to each other, and that nucleic acids are always written 5' 3' on the MCAT. Therefore, we are looking for an answer that ends with "AC" (rather than starting with "CA").

Specific transcription factors bind to a specific DNA sequence, such as an enhancer, and to RNA polymerase at a single promoter sequence. They enable the RNA polymerase to transcribe the specific gene for that enhancer

UAG is one of the three known stop codons, so changing tyrosine to a stop codon must be a nonsense (or truncation) mutation. In this question, the correct answer is the answer that is not associated with increased transcription.

DNA methylation, (C), is associated with silencing of gene expression. Regions of DNA with poor gene expression, called heterochromatin, are heavily methylated. These modifications



significantly decrease the ability of RNA polymerase to access DNA. The example given is a sample of repression due to the abundance of a corepressor. In other words, this is a repressible system that is currently blocking transcription. For the trp operon, an abundance of tryptophan in the environment allows for the repressor to bind tryptophan and then to the operator site. This blocks transcription of the genes required to synthesize tryptophan within the cell. The system described is a repressible system; the lac operon is an inducible system, in which an inducer binds to the repressor, thus permitting transcription. shRNA (short hairpin RNA) is a useful biotechnology tool used in RNA interference. It is not, however, produced in the nucleus for use in the spliceosome. It targets mRNA to be degraded in the cytoplasm; it is not utilized in splicing of the hnRNA (heterogeneous nuclear RNA). snRNA (small nuclear RNA) and snRNPs (small nuclear ribonucleoproteins), however, do bind to the hnRNA to induce splicing. In this table, we are given the sequence of the sense (coding) DNA strand. This will be identical to the mRNA transcript, except all thymine nucleotides will be replaced with uracil. With the deletion of these three bases, codon 507 changes from AUC to AUU in the transcript; these both code for isoleucine due to wobble. However, codon 508 (UUU in the transcript) has been lost. UUU codes for phenylalanine. The C-terminus sequence will remain unchanged because the deletion of three bases (exactly one codon) will not throw off the reading frame. For reference, the mutant reading frames would be: (Note: refer back to Figure 7.5 for a table of the genetic code) The intron will not be a part of the final, processed mRNA, and the untranslated regions of the mRNA will not be turned into amino acids. Translation will begin with codon 1 (which would be AUG). Because there are 150 amino acids, we can surmise that there will be 151 codons. Each codon will use 3 nucleotides, so  $150 \times 3 = 450$  because codon 151 will be the Peptidyl transferase connects the incoming amino terminal to the previous carboxyl terminal; the only functional group listed here with a carbonyl and amino group is the amide. Peptide bonds are thus amide linkages, and the correct answer is (B). RNA polymerase I in eukaryotes is found in the nucleolus and is in charge of transcribing most of the rRNA for use during ribosomal creation. RNA polymerase II is responsible for hnRNA and

snRNA. RNA polymerase III is responsible for tRNA and the 5S rRNA. To answer this question correctly, we must remember that mRNA will be antiparallel to DNA. Our answer should be 5' to 3' mRNA, with the 5' end complementary to the 3' end of the DNA that is being transcribed. Thus, the mRNA transcribed from this strand will be 5'—GGAUGUCUCAAGA— 3'. mRNA contains uracil, rather than thymine. The mRNA produced has the same structure as the sense strand of DNA (with uracils instead of thymines). Because bonding of nucleic acids is always complementary but antiparallel, the antisense strand of mRNA would be the one that binds to the produced mRNA, creating double-stranded RNA that is then degraded once found in the cytoplasm. Consult your online resources for additional practice. Biochemistry Chapter 1 Amino Acids, Peptides, and Proteins Biochemistry Chapter 2 Biochemistry Chapter 6 DNA and Biotechnology Biology Chapter 1 Biology Chapter 3 Embryogenesis and Development Biology Chapter 12 Genetics and Evolution Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate.

**How to Use This Assessment** If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one. If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect. If you answer 12–15 questions correctly: Spend less

than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. A student is trying to determine the type of membrane transport occurring in a cell. The student finds that the molecule to be transported is very large and polar, and when transported across the membrane, no energy is required. Which of the following is the most likely mechanism of transport? A. Active transport B. Simple diffusion C. Facilitated diffusion

2. A researcher treats a solution containing animal cells with ouabain, a poisonous substance that interferes with the sodium–potassium ATPase embedded in the cell membrane, and the cell lyses as a result. Which of the following statements best describes ouabain's effects? A. Treatment with ouabain results in high levels of extracellular B. Treatment with ouabain results in high levels of extracellular potassium and sodium. C. Treatment with ouabain increases intracellular concentrations D. Treatment with ouabain decreases intracellular concentrations

3. Resting membrane potential depends on: I. the differential distribution of ions across the membrane. II. active transport processes. III. selective permeability of the phospholipid bilayer. A. I only B. I and III only C. II and III only D. I, II, and III

4. Which of the following is NOT a function of the cell membrane? A. Cytoskeletal attachment B. Protein synthesis C. Transport regulation D. Second messenger reservoir

5. The dynamic properties of molecules in the cell membrane are most rapid in: A. phospholipids moving within the plane of the membrane. B. phospholipids moving between the layers of the membrane. C. proteins moving within the plane of the membrane. D. proteins exiting the cell through exocytosis.

6. Which lipid type is LEAST likely to contribute to membrane A. Unsaturated glycerophospholipids B. trans glycerophospholipids D. Unsaturated sphingolipids

7. A membrane receptor is most likely to be a(n): A. embedded protein with catalytic activity. B. transmembrane protein with sequestration activity. C. membrane-associated protein with sequestration activity. D. transmembrane protein with catalytic activity.

8. Which of the

following is NOT a cell-cell junction in animals? B. Gap junctions D. Tight junctions 9. Which of the following is true of diffusion and osmosis? A. Diffusion and osmosis rely on the concentration gradient of only the compound of interest. B. Diffusion and osmosis rely on the concentration gradient of all compounds in a cell. C. Diffusion and osmosis will proceed in the same direction if there is only one solute. D. Diffusion and osmosis cannot occur simultaneously. 10. The bulk movement of liquid into a cell through vesicular infoldings is known as: 11. Which of the following is LEAST likely to be the resting membrane potential of a cell? A. 70 mV B. 55 mV C. 0 mV D. +35 mV 12. How does the inner mitochondrial membrane differ from the outer A. The inner mitochondrial membrane is more permeable and B. The inner mitochondrial membrane is less permeable and C. The inner mitochondrial membrane is more permeable and D. The inner mitochondrial membrane is less permeable and has 13. For most cells, the extracellular calcium concentration is around 10,000 times higher than the intracellular calcium concentration. What is the membrane potential established by this A. 123 mV B. 61.5 mV C. +61.5 mV D. +123 mV 14. Which of the following statements conflicts with the fluid mosaic A. The cell membrane is static in structure. B. Membrane components can be derived from multiple C. Hydrophobic interactions stabilize the lipid bilayer. D. Proteins are asymmetrically distributed within the cell 15. Which of the following is a sphingolipid? In

This Chapter 8.1 Fluid Mosaic Model General Membrane Structure and Function 8.2 Membrane Components 8.3 Membrane Transport Endocytosis and Exocytosis 8.4 Specialized Membranes The content in this chapter should be relevant to about 10% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories: 2A: Assemblies of molecules, cells, and groups of cells within single cellular and multicellular organisms 3A: Structure and functions of the nervous and endocrine systems, and ways in which these systems coordinate the Biological membranes are a stunning combination of opposites and contrasts. They are exceptionally thin, structurally bland, and relatively straightforward to describe. Yet, they define the borders of cells, tissues, and organelles; carry out a significant number of the biological functions within cells; and are an

unending source of scientific inquiry and discovery. The most commonly tested biological membrane on the MCAT is the plasma membrane. At first, the plasma membrane seems like it's only a shell—just a barrier that defines the cell. But the plasma membrane plays roles in signaling, entry of nutrients and expulsion of waste, cell recognition, transport of materials between tissues, and even electronic functions. Cell membranes have both a stretchy, flexible component (phospholipids) and an abundance of stabilizing molecules (cholesterol and protein) to make sure that everything remains intact. In this chapter, we will examine the general function, composition, and transport properties of biological membranes. We will conclude by taking a look at a few specialized cell membranes within the body, in addition to specific membrane properties.

### 8.1 Fluid Mosaic Model

After Chapter 8.1, you will be able to:

- Describe the functions of flippases and lipid rafts
- Order a given list of membrane components from least to most abundant

The cell (plasma) membrane is often described as a semipermeable phospholipid bilayer. This phrase alone describes both the function and structure of the cell membrane: as a semipermeable barrier, it chooses which particles can enter and leave the cell at any point in time. This selectivity is mediated not only by the various channels and carriers that poke holes in the membrane, but also by the membrane itself. Composed primarily of two layers of phospholipids, the cell membrane permits fat-soluble compounds to cross easily, while larger and water-soluble compounds must seek alternative entry. The cell membrane is illustrated in Figure 8.1; the theory that underlies the structure and function of the cell membrane is referred to as the fluid mosaic.

### Figure 8.1 Cell Membrane

The cell membrane is a phospholipid bilayer that regulates movement of solutes into and out of the cell.

### General Membrane Structure and Function

The phospholipid bilayer also includes proteins and distinct signaling areas within lipid rafts. Carbohydrates associated with membrane-bound proteins create a glycoprotein coat. The cell wall of plants, bacteria, and fungi contain higher levels of carbohydrates. The main function of the cell membrane is to protect the interior of the cell from the external environment. Cellular membranes selectively regulate traffic into and out of the cell and are involved in both intracellular and intercellular

communication and transport. Cell membranes also contain proteins embedded within the lipid bilayer that act as cellular receptors during signal transduction. These proteins play an important role in regulating and maintaining overall cellular The cell membrane functions as a stable semisolid barrier between the cytoplasm and the environment, but it is in a constant state of flux on the molecular level. Phospholipids move rapidly in the plane of the membrane through simple diffusion. This can be seen when fusing two membranes that have been tagged with different labels; the tags will migrate with their associated lipids until both types are rapidly intermixed. Lipid rafts are collections of similar lipids with or without associated proteins that serve as attachment points for other biomolecules; these rafts often serve roles in signaling. Both lipid rafts and proteins also travel within the plane of the membrane, but more slowly. Lipids can also move between the membrane layers, but this is energetically unfavorable because the polar head group of the phospholipid must be forced through the nonpolar tail region in the interior of the membrane. Specialized enzymes called flippases assist in the transition or “flip” between layers. Dynamic changes in the concentrations of various membrane proteins are mediated by gene regulation, endocytotic activity, and protein insertion. Many cells, particularly those involved in biosignaling processes, can up- or downregulate the number of specific cellular receptors on their surface in order to meet cellular requirements. Many antidepressants increase levels of neurotransmitters in the brain, but the effects take longer to appear than the changes in neurochemistry. The reason for this delay is that the nervous system must still upregulate its postsynaptic receptors to respond to the new levels of neurotransmitter.

MCAT CONCEPT CHECK 8.1 Before you move on, assess your understanding of the material with these questions.

1. Describe the role of flippases and lipid rafts in biological membranes.
2. List the following membrane components in order from most plentiful to least plentiful: carbohydrates, lipids, proteins, nucleic acids.

8.2 Membrane Components After Chapter 8.2, you will be able to:

- Describe the role of cholesterol in cell membranes
- Define the three classes of membrane proteins: transmembrane, embedded, and membrane-associated
- Differentiate between gap junctions, tight junctions, desmosomes, and

hemidesmosomes Identify level of saturation, as well as the hydrophilic and hydrophobic portions of a phospholipid: While the fluid mosaic model outlines the general composition of the membrane, the MCAT expects us to have a stronger grasp of the specifics, especially as it pertains to lipids and proteins. The cell membrane is composed predominantly of lipids with some associated proteins and carbohydrates. At times, the cell membrane as a whole will be referred to as a phospholipid bilayer, as it is the primary component of this barrier around the cell. Within the cell membrane, there are a large number of phospholipids with very few free fatty acids. In addition, steroid molecules and cholesterol, which lend fluidity to the membrane, and waxes, which provide membrane stability, help to maintain the structural integrity of the cell. While the structural details of these lipids were discussed in detail in Chapter 5 of MCAT Biochemistry Review, we will briefly describe their key points here. Trans fats, which result from the partial hydrogenation of some unsaturated fatty acids, have been banned from certain stores and cities because of their health risks. Part of the health concern is due to their ability to lower membrane fluidity, in addition to the tendency of trans fats to accumulate and form plaques in blood vessels. Fatty Acids and Triacylglycerols Fatty acids are carboxylic acids that contain a hydrocarbon chain and terminal carboxyl group. Triacylglycerols, also referred to as triglycerides, are storage lipids involved in human metabolic processes. They contain three fatty acid chains esterified to a glycerol molecule. Fatty acid chains can be saturated or unsaturated. Unsaturated fatty acids are regarded as “healthier” fats because they tend to have one or more double bonds and exist in liquid form at room temperature; in the plasma membrane, these characteristics impart fluidity to the membrane. Humans can only synthesize a few of the unsaturated fatty acids; the rest come from essential fatty acids in the diet that are transported as triacylglycerols from the intestine inside chylomicrons. Two important essential fatty acids for humans are  $\alpha$ -linolenic acid and linoleic acid. Saturated fatty acids are the main components of animal fats and tend to exist as solids at room temperature. Saturated fats are found in processed foods and are considered less healthy. When incorporated into phospholipid membranes, saturated fatty acids decrease

the overall membrane fluidity. By substituting one of the fatty acid chains of triacylglycerol with a phosphate group, a polar head group joins the nonpolar tails, forming a glycerophospholipid, commonly called a phospholipid. Phospholipids spontaneously assemble into micelles (small monolayer vesicles) or liposomes (bilayered vesicles) due to hydrophobic interactions. Glycerophospholipids are used for membrane synthesis and can produce a hydrophilic surface layer on lipoproteins such as very-low-density lipoprotein (VLDL), a lipid transporter. In addition, phospholipids are the primary component of cell membranes. Phospholipids serve not only structural roles, but can also serve as second messengers in signal transduction. The phosphate group also provides an attachment point for water-soluble groups, such as choline (phosphatidylcholine, also known as lecithin) or inositol (phosphatidylinositol). A comparison of triacylglycerols and glycerophospholipids is shown in Figure 8.2.

**Figure 8.2 Triacylglycerol and Glycerophospholipid (Phosphatidylinositol)**

The ratio of certain sphingolipids to glycerophospholipids can help to identify particular membranes within the cell, but memorizing this information is unnecessary for Test Day. Where small details like this are important, they will be provided in a passage. Sphingolipids are also important constituents of cell membranes. Although sphingolipids do not contain glycerol, they are similar in structure to glycerophospholipids, in that they contain a hydrophilic region and two fatty acid-derived hydrophobic tails. The various classes of sphingolipids shown in Figure 8.3 differ primarily in the identity of their hydrophilic regions. Classes of sphingolipids and their hydrophilic groups include ceramide, sphingomyelins, cerebroside, and gangliosides.

**Figure 8.3 Types of Sphingolipids**

Sphingolipids are sequentially modified to form each of the biologically necessary molecules in the class.

**Cholesterol and Steroids**

Cholesterol is associated with a number of negative health effects and receives a lot of negative press; however, it is also a very important molecule in our cells. Cholesterol not only regulates membrane fluidity, but it is also necessary in the synthesis of all steroids, which are derived from cholesterol. The structure of cholesterol is similar to that of phospholipids in that cholesterol contains both a hydrophilic and hydrophobic region. Membrane stability is derived from



interactions with both the hydrophilic and hydrophobic regions that make up the phospholipid bilayer. While cholesterol stabilizes adjacent phospholipids, it also occupies space between them. This prevents the formation of crystal structures in the membrane, increasing fluidity at lower temperatures. At high temperatures, cholesterol has the opposite effect: by limiting movement of phospholipids within the bilayer, it decreases fluidity and helps hold the membrane intact. By mass, cholesterol composes about 20 percent of the cell membrane; by mole fraction, it makes up about half. This large ratio of cholesterol to phospholipid ensures that the membrane remains fluid. Waxes are a class of lipids that are extremely hydrophobic and are rarely found in the cell membranes of animals, but are sometimes found in the cell membranes of plants. A wax is composed of a long-chain fatty acid and a long-chain alcohol, which contribute to the high melting point of these substances. When present within the cell membrane, waxes can provide both stability and rigidity within the nonpolar tail region only. Most waxes serve an extracellular function in protection or waterproofing. The fluid mosaic model also accounts for the presence of three types of membrane proteins, as shown in Figure 8.4. Transmembrane proteins pass completely through the lipid bilayer. Embedded proteins, on the other hand, are associated with only the interior (cytoplasmic) or exterior (extracellular) surface of the cell membrane. Together, transmembrane and embedded proteins are considered integral proteins because of their association with the interior of the plasma membrane, which is usually assisted by one or more membrane-associated domains that are partially hydrophobic. Membrane-associated (peripheral) proteins may be bound through electrostatic interactions with the lipid bilayer, especially at lipid rafts, or to other transmembrane or embedded proteins, like the G proteins found in G protein-coupled receptors. Transporters, channels, and receptors are generally transmembrane proteins. Figure 8.4 Plasma Membrane Proteins Carbohydrates are generally attached to protein molecules on the extracellular surface of cells. Because carbohydrates are generally hydrophilic, interactions between glycoproteins and water can form a coat around the cell, as shown in Figure 8.5. In addition, carbohydrates can act as signaling and

recognition molecules. For example, blood group (ABO) antigens on red blood cells are sphingolipids that differ only in their carbohydrate sequence. Our immune systems and some pathogens take advantage of these membrane carbohydrates and membrane proteins to target

**Figure 8.5 Extracellular Membrane-Associated Carbohydrates** *Staphylococcus aureus* bacteria embedded in bands of extracellular polysaccharides and glycolipids, forming a biofilm

Biosignaling is a major function of the cell membrane. Receptors and signal cascades are covered in more detail in Chapter 3 of MCAT Biochemistry Review. Some of the transporters for facilitated diffusion and active transport can be activated or deactivated by membrane receptors, which tend to be transmembrane proteins. For example, ligand-gated ion channels are membrane receptors that open a channel in response to the binding of a specific ligand. Other membrane receptors participate in biosignaling; for example, G protein-coupled receptors are involved in several different signal transduction cascades. Membrane receptors are generally proteins, although there are some carbohydrate and lipid receptors, especially in viruses. Cells within tissues can form a cohesive layer via intercellular junctions. These junctions provide direct pathways of communication between neighboring cells or between cells and the extracellular matrix. Cell-cell junctions are generally comprised of cell adhesion molecules (CAM), which are proteins that allow cells to recognize each other and contribute to proper cell differentiation and development. Gap junctions allow for direct cell-cell communication and are often found in small bunches together. Gap junctions are also called connexons and are formed by the alignment and interaction of pores composed of six molecules of connexin, as shown in Figure 8.6. They permit movement of water and some solutes directly between cells. Proteins are generally not transferred through gap junctions.

**Figure 8.6 Gap Junction** A connexon (gap junction) is composed of six monomers of connexin and permits travel of solutes between cells. Tight junctions form a watertight seal, preventing paracellular transport of water and solutes. Tight junctions are found in the lining of renal tubules, where they restrict passage of solutes and water without cellular control. Nephrons are discussed in Chapter 10 of MCAT Biology Review. Tight junctions prevent solutes from

leaking into the space between cells via a paracellular route. Tight junctions are found in epithelial cells and function as a physical link between the cells as they form a single layer of tissue. Tight junctions can limit permeability enough to create a transepithelial voltage difference based on differing concentrations of ions on either side of the epithelium. To be effective, tight junctions must form a continuous band around the cell; otherwise, fluid could leak through spaces between tight junctions. Desmosomes bind adjacent cells by anchoring to their cytoskeletons. Desmosomes are formed by interactions between transmembrane proteins associated with intermediate filaments inside adjacent cells, as shown in Figure 8.7. Desmosomes are primarily found at the interface between two layers of epithelial tissue. Hemidesmosomes have a similar function, but their main function is to attach epithelial cells to underlying structures, especially the basement membrane. Figure 8.7 Desmosomes Between Adjacent Cells

MCAT CONCEPT CHECK 8.2 Before you move on, assess your understanding of the material with these questions.

1. In the following phospholipid, determine whether the fatty acids are saturated or unsaturated and label their hydrophobic and hydrophilic regions.
2. How does cholesterol play a role in the fluidity and stability of the plasma membrane?
3. What are the three classes of membrane proteins? How are they each most likely to function?
4. Contrast gap junctions and tight junctions.

BIOCHEMISTRY GUIDED EXAMPLE WITH EXPERT THINKING Transplantation of pancreatic islets into patients who have Type 1 diabetes is hampered by inflammatory reactions at the transplantation site leading to dysfunction and death of insulin producing beta-cells. Recently, it was discovered that co-transplantation of neural crest stem cells (NCSCs) together with islet cells may improve transplantation outcomes. However, it could not be determined whether protection was obtained by the release of soluble factors, or whether direct cell-cell contact was required. Another investigation was conducted to describe the in vitro interaction between NCSCs and insulin-producing beta- TC6 cells that may mediate protection against cytokine-induced producing cells causes inflammation, leading to failure of transplant Possible solution: using NCSCs with transplant, but not sure how it works Goal of study: figure out how NCSCs interact

with pancreatic cells to protect NCSCs were plated on laminin-coated plates or 0.4 micrometer cell inserts and after three days, beta-TC6 cells were added. The inserts allow for passage of soluble factors, but not direct cell-to-cell contact. After 48 hours, cytokines IL-1 $\beta$  and IFN- $\beta$  were added. Finally, 48 hours later, cells were labeled with propidium iodide, trypsinized, and analyzed for cell death by flow. Lots of sequential steps in the experimental setup, which may be important for understanding the figure. There's a specific order in which cells are plated, as cytometry. The experiment was repeated except that beta-TC6 cells were plated first, then NCSCs were added after 48 hours. Results plotted below are means for five independent \*\* denotes  $p < 0.01$  well as whether inserts were IV: order in which cell type plated, ECM or insert used, cytokine omitted or added DV: cell death Trend: significant difference between beta-cell alone and beta-cell with NCSC (no Adapted from Ngamjariyawat, A., Turpaev, K., Vasylovska, S., Kozlova, E. N., & Welsh, N. (2013). Co-culture of neural crest stem cells (NCSC) and insulin producing beta-TC6 cells results in cadherin junctions and protection Based on this experiment, are NCSCs protecting beta islet cells from cytokine-induced cell death through direct contact, or through indirect Since the question requires data from the figure, we need to have a solid understanding of the results. The experimental question is asking whether beta-cells require direct contact with NCSCs, or whether the NCSCs are secreting soluble factors that are mediating protection from cytokine-mediated cell death. We'll need to refer to the passage for more information on these phenomena and how they interact. In the introduction to the experiment we can see that we are learning about co-transplantation of NCSCs and beta- cells, and that the experiments are trying to determine why co-transplantation is more effective than transplanting beta-cells alone. The way this was tested in the experimental setup is through the usage of cell inserts, which we are told in paragraph 2 will allow for the passage of factors, but not cell-cell contact. The results on the left (first 6 bars) correspond to where NCSCs are plated first, then beta- cells are added with and without inserts. All 6 bars are roughly equal and the addition of cytokines do not seem to induce additional cell death, meaning these results cannot be used to make any conclusions

since the expected control response (beta-cells inducing cell death in the presence of cytokines) is not shown. Taking a look at the next six columns in the graph, we can see that these are the experiments with the beta-cells being plated first. NCSCs were added 48 hours later, either with or without insert. The graph tells us that in the presence of cytokines, beta-cells alone show a high percentage of cell death (the expected control response), but having the NCSCs without insert shows a significant drop in cell death. This effect goes away when the insert is reintroduced: beta-cells with the NCSC insert have a higher level of cell death, though it's unclear whether that difference is significant. Because the inserts obstruct cell-to-cell contact, we can conclude that direct contact between beta-cells and NCSCs is required for protection against cytokine-mediated cell death.

### 8.3 Membrane Transport

After Chapter 8.3, you will be able to:

- Explain the driving factors behind passive transport mechanisms
- Contrast symport and antiport mechanisms for active transport
- Relate osmotic pressure to the direction of osmosis

The cell membrane functions to control movement of substances into and out of the cell; however, it varies in its selectivity for different substances. Transport of small nonpolar molecules occurs rapidly through the cell membrane via diffusion, while ions and larger molecules require more specialized transport processes. The different membrane traffic processes are classified as either active or passive, and are driven by concentration gradients or intracellular energy stores. An important point to keep in mind is that all transmembrane movement is based on concentration gradients, which are an MCAT favorite; understanding concentration gradients will net you points on Test Day. Remember that the gradient will tell us whether this process will be passive or active. Transport processes can be classified as active or passive depending on their thermodynamics. Spontaneous processes that do not require energy (negative  $\Delta G$ ) proceed through passive transport, while those that are nonspontaneous and require energy (positive  $\Delta G$ ) proceed through active transport. Diffusion, facilitated diffusion, and osmosis generally increase in rate as temperature increases, while active transport may or may not be affected by temperature, depending on the enthalpy ( $\Delta H$ ) of the process. The primary thermodynamic motivator in

most passive transport is an increase in entropy ( $\Delta S$ ). Passive transport processes are those that do not require intracellular energy stores but rather utilize the concentration gradient to supply the energy for particles to move. The most basic of all membrane traffic processes is simple diffusion, in which substrates move down their concentration gradient directly across the membrane. Only particles that are freely permeable to the membrane are able to undergo simple diffusion. There is potential energy in a chemical gradient; some of this energy is dissipated as the gradient is utilized during simple diffusion. We can liken this process to a ball rolling down a hill: there is potential energy in the ball when it sits at the top of the hill, and as the ball spontaneously rolls down the hill, some of the energy is dissipated. Osmolarity explains why pure water should never be given intravenously for resuscitation. Red blood cells have an osmolarity around 300 mOsm, while pure water has an osmolarity of 0 mOsm. Water would rush into the red blood cells, causing them to burst. To avoid this, saline or dextrose-containing solutions are used. Osmosis is a specific kind of simple diffusion that concerns water; water will move from a region of lower solute concentration to one of higher solute concentration. That is, it will move from a region of higher water concentration (more dilute solution) down its gradient to a region of lower water concentration (more concentrated solution). Osmosis is important in several places, most notably when the solute itself is impermeable to the membrane. In such a case, water will move to try to bring solute concentrations to equimolarity, as shown in Figure 8.8. If the concentration of solutes inside the cell is higher than the surrounding solution, the solution is said to be hypotonic; such a solution will cause a cell to swell as water rushes in, sometimes to the point of bursting (lysing). A solution that is more concentrated than the cell is termed a hypertonic solution, and water will move out of the cell. If the solutions inside and outside are equimolar, they are said to be isotonic. A key point here is that isotonicity does not prevent movement; rather, it prevents the net movement of particles. Water molecules will continue to move; however, the cell will neither gain nor lose water overall. Figure 8.8 Osmosis Water moves from areas of low solute (high water) concentration to high solute (low water) concentration. To remember that water flows into a cell

placed in hypotonic solution, imagine the cell swelling to form a giant letter O. One method of quantifying the driving force behind osmosis is osmotic pressure. Osmotic pressure is a colligative property: a physical property of solutions that is dependent on the concentration of dissolved particles but not on the chemical identity of those dissolved particles. Other examples of colligative properties include vapor pressure depression (Raoult's Law), boiling point elevation, and freezing point depression. To illustrate osmotic pressure, consider a container separated into two compartments by a semipermeable membrane, just like the membranes in our cells. One compartment contains pure water, while the other contains water with dissolved solutes. The membrane allows water but not solutes to pass through. Because substances tend to flow, or diffuse, from higher to lower concentration (which results in an increase in entropy), water will diffuse from the compartment containing pure water into the compartment containing the water-solute mixture. This net flow will cause the water level in the compartment containing the solution to rise above the level in the compartment containing pure water, as shown in Figure 8.9. Figure 8.9 Change in Water Level Due to Osmotic Pressure Because the solute cannot pass through the membrane, the concentrations of solute in the two compartments can never be equal. However, the hydrostatic pressure exerted by the water level in the solute-containing compartment will eventually oppose the influx of water; thus, the water level will only rise to the point at which it exerts a sufficient pressure to counterbalance the tendency of water to flow across the membrane. This pressure, defined as the osmotic pressure ( $\Pi$ ) of the solution, is given by the formula: where  $M$  is the molarity of the solution,  $R$  is the ideal gas constant,  $T$  is the absolute temperature (in kelvins),  $i$  is the van't Hoff factor, which is simply the number of particles obtained from the molecule when in solution. For example, glucose remains one intact molecule, so  $i_{\text{glucose}} = 1$ ; sodium chloride becomes two ions ( $\text{Na}^+$  and  $\text{Cl}^-$ ), so  $i_{\text{NaCl}} = 2$ . The equation clearly shows that osmotic pressure is directly proportional to the molarity of the solution. Thus, osmotic pressure, like all colligative properties, depends only on the presence and number of particles in solution, but not their actual identity. In cells, the osmotic pressure is maintained against

the cell membrane, rather than the force of gravity. If the osmotic pressure created by the solutes within a cell exceeds the pressure that the cell membrane can withstand, the cell will lyse. Generally, osmotic pressure is best thought of as a “sucking” pressure, drawing water into the cell in proportion to the concentration of the solution. Unless otherwise specified, semipermeable membrane refers to a membrane governed by the same permeability rules as biological membranes: small, nonpolar, lipid-soluble particles (and water) can pass through freely, while large, polar, or charged particles cannot. Facilitated diffusion is simple diffusion for molecules that are impermeable to the membrane (large, polar, or charged); the energy barrier is too high for these molecules to cross freely. Facilitated diffusion requires integral membrane proteins to serve as transporters or channels for. The classic examples of facilitated diffusion involve a carrier or channel protein. Carriers are only open to one side of the cell membrane at any given point. This model is similar to a revolving door because the substrate binds to the transport protein (walks in), remains in the transporter during a conformational change (spins), and then finally dissociates from the substrate-binding site of the transporter (walks out). Binding of the substrate molecule to the transporter protein induces a conformational change; for a brief time, the carrier is in the occluded state, in which the carrier is not open to either side of the phospholipid bilayer. In addition to carriers, channels are also viable transporters for facilitated diffusion. Channels may be in an open or closed conformation. In their open conformation, channels are exposed to both sides of the cell membrane and act like a tunnel for the particles to diffuse through, thereby permitting much more rapid transport kinetics. The activity of the three main types of ion channels is discussed in Chapter 3 of MCAT Biochemistry Review. Active transport results in the net movement of a solute against its concentration gradient, just like rolling a ball uphill. Active transport always requires energy, but the source of this energy can vary. Primary active transport uses ATP or another energy molecule to directly power the transport of molecules across a membrane. Generally, primary active transport involves the use of a transmembrane ATPase. Secondary active transport, also known as coupled transport, also uses energy to transport particles



across the membrane; however, in contrast to primary active transport, there is no direct coupling to ATP hydrolysis. Instead, secondary active transport harnesses the energy released by one particle going down its electrochemical gradient to drive a different particle up its gradient. When both particles flow the same direction across the membrane, it is termed symport. When the particles flow in opposite directions, it is called antiport. Active transport is important in many tissues. For instance, primary active transport maintains the membrane potential of neurons in the nervous system. The kidneys use secondary active transport, usually driven by sodium, to reabsorb and secrete various solutes into and out of Figure 8.10 shows simple diffusion, facilitated diffusion, and active transport. Table 8.1 summarizes these types of movement as well as osmosis. Figure 8.10 Membrane Transport Processes The movement of solutes across the cell membrane is mediated by concentration gradients. Table 8.1 Membrane Transport Processes

	gradient of solute	High	Low	Low	High	High	Low	Low
High	No—this is a	No—this is a	No—this is a	passive	Yes—this is an active process; requires energy (glucose) or ions (Na <sup>+</sup> , Polar molecules or ions (Na <sup>+</sup> , Cl <sup>-</sup> , K <sup>+</sup> )	Endocytosis and Exocytosis	Endocytosis occurs when the cell membrane invaginates and engulfs material to bring it into the cell. The material is encased in a vesicle, which is important because cells will sometimes ingest toxic substances. Pinocytosis is the endocytosis of fluids and dissolved particles, whereas phagocytosis is the ingestion of large solids such as bacteria. Substrate binding to specific receptors embedded within the plasma membrane will initiate the process of endocytosis. Invagination will then be initiated and carried out by vesicle-coating proteins, most notably Exocytosis occurs when secretory vesicles fuse with the membrane, releasing material from inside the cell to the extracellular environment. Exocytosis is important in the nervous system and intercellular signaling. For instance, exocytosis of neurotransmitters from synaptic vesicles is a crucial aspect of neuron physiology. Both endo- and exocytosis are illustrated in Figure 8.11. Figure 8.11 Endocytosis and Exocytosis	MCAT CONCEPT CHECK 8.3

Before you move on, assess your understanding of the material with these questions. 1. What is the primary thermodynamic factor responsible for passive transport? 2. What is the

relationship between osmotic pressure and the direction of osmosis through a semipermeable membrane. 3. Compare the two types of active transport. What is the difference between symport and antiport?

### 8.4 Specialized Membranes

After Chapter 8.4, you will be able to:

- Identify the channels involved in maintenance of the resting membrane potential
- Calculate resting membrane potential using the Nernst equation
- Distinguish between the different regions of the mitochondrion

The membranes of most organelles are similar to the cell membrane in both composition and general characteristics; however, it is important to note that some membranes are specialized to accomplish specific functions. For instance, the sarcolemma of muscle cells must maintain a membrane potential for muscle contraction to occur. Membrane composition may also be altered slightly, especially in the case of mitochondria. The impermeability of the cell membrane to ions and the selectivity of ion channels both lead to an electrochemical gradient between the exterior and interior of cells. The difference in electrical potential across cell membranes is called the membrane potential,  $V_m$ . The resting potential for most cells is between -40 and -80 mV, although the potential can rise as high as +35 mV during depolarization of the cell. Maintaining membrane potential requires energy because ions may passively diffuse through the cell membrane over time using leak channels; therefore, an ion transporter or pump such as the sodium-potassium pump ( $\text{Na}^+/\text{K}^+$  ATPase) regulates the concentration of intracellular and extracellular sodium and potassium ions. Chloride ions also participate in establishing membrane potential. The Nernst equation can be used to determine the membrane potential from the intra- and extracellular concentrations of the various ions:  $E = \frac{RT}{zF} \ln \frac{[\text{ion}]_{\text{outside}}}{[\text{ion}]_{\text{inside}}}$  where  $R$  is the ideal gas constant,  $T$  is the temperature in kelvins,  $z$  is the charge of the ion, and  $F$  is the Faraday constant (96,485 mol e<sup>-</sup>). The simplification to 61.5 in the numerator assumes body temperature, 310 K. The Goldman-Hodgkin-Katz voltage equation flows from the Nernst equation, taking into account the relative contribution of each major ion to the membrane potential:  $V_m = \frac{61.5}{z} \log \left[ \frac{P_{\text{Na}^+} [\text{Na}^+]_{\text{outside}} + P_{\text{K}^+} [\text{K}^+]_{\text{outside}} + P_{\text{Cl}^-} [\text{Cl}^-]_{\text{inside}}}{P_{\text{Na}^+} [\text{Na}^+]_{\text{inside}} + P_{\text{K}^+} [\text{K}^+]_{\text{inside}} + P_{\text{Cl}^-} [\text{Cl}^-]_{\text{outside}}} \right]$  The cell membrane is often compared to a capacitor

because opposite charges are maintained on either side of the membrane. Capacitance is discussed in Chapter 6 of MCAT Physics and Math Review. where  $P$  represents the permeability for the relevant ion. Note that chloride is inverted relative to the other ions because it carries a negative charge. There is a steady-state resting relationship between ion diffusion and the  $\text{Na}^+/\text{K}^+$  ATPase. One of the main functions of the  $\text{Na}^+/\text{K}^+$  ATPase is to maintain a low concentration of sodium ions and high concentration of potassium ions intracellularly by pumping three sodium ions out for every two potassium ions pumped in. This movement of ions removes one positive charge from the intracellular space of the cell, which maintains the negative resting potential of the cell. As mentioned before, the cell membrane also contains leak channels that allow ions, such as  $\text{Na}^+$  and  $\text{K}^+$ , to passively diffuse into or out of the cell down their concentration gradients. Cell membranes are more permeable to  $\text{K}^+$  ions than  $\text{Na}^+$  ions at rest because there are more  $\text{K}^+$  leak channels than  $\text{Na}^+$  leak channels. The combination of  $\text{Na}^+/\text{K}^+$  ATPase activity and leak channels together maintain a stable resting membrane potential. Mitochondria are referred to as the “powerhouse” of the cell because of their ability to produce ATP by oxidative respiration. Mitochondria contain two membranes: the inner and outer Outer Mitochondrial Membrane The outer mitochondrial membrane is highly permeable due to many large pores that allow the passage of ions and small proteins. The outer membrane completely surrounds the inner mitochondrial membrane, with the presence of a small intermembrane space in between the two Inner Mitochondrial Membrane The inner mitochondrial membrane has a much more restricted permeability compared to the outer mitochondrial membrane. Structurally, the inner mitochondrial membrane contains numerous infoldings, known as cristae, which increase the available surface area for the integral proteins associated with the membrane. These proteins, discussed in Chapter 10 of MCAT Biochemistry Review, are involved in the electron transport chain and ATP synthesis. The inner membrane also encloses the mitochondrial matrix, where the citric acid cycle produces high- energy electron carriers used in the electron transport chain. The inner mitochondrial membrane contains a very high level

of cardiolipin and does not contain cholesterol. MCAT CONCEPT CHECK 8.4 Before you move on, assess your understanding of the material with these questions. 1. How is the resting membrane potential maintained? 2. Given the following data, calculate the resting membrane potential of this cell: 3. What distinguishes the inner mitochondrial membrane from other biological membranes? What is the pH gradient between the cytoplasm and the intermembrane space? Understanding biological membranes becomes increasingly important as you progress in your medical career. At this point, you should have a strong foundation of knowledge about the fluid mosaic model and how membranes exist dynamically. We've also covered the components of cell membranes, with a special emphasis on lipids and the phospholipid bilayer. We reviewed some basic physical properties of the cell, including cell-cell junctions. We also examined membrane transport, such as passive transport (simple diffusion, facilitated diffusion, and osmosis) and active transport, before briefly touching upon endocytosis and exocytosis. Finally, we reviewed specialized membranes within cells. Up to now, you have been exposed to each of the classes of molecules and some of their applications both experimentally and within the cell. This comprehensive review should provide you with a better understanding of what will be expected of you on Test Day and briefly introduce you to topics that you will learn more about in medical The first seven chapters of MCAT Biochemistry Review focused on various types of biomolecules, their structures, and their functions. In this chapter, we applied this knowledge of biomolecules to make sense of biological membranes. In the remaining four chapters, we'll turn our attention to the metabolic pathways by which the body builds, stores, and burns these biomolecules. You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources!

### Fluid Mosaic Model

The fluid mosaic model accounts for the presence of lipids, proteins, and carbohydrates in a dynamic, semisolid plasma membrane that surrounds cells. The plasma membrane contains proteins embedded within the phospholipid bilayer. The membrane is not static. Lipids move freely in the plane of the membrane and can assemble into lipid rafts. Flippases are specific membrane

proteins that maintain the bidirectional transport of lipids between the layers of the phospholipid bilayer in cells. Proteins and carbohydrates may also move within the membrane, but are slowed by their relatively large size. Lipids are the primary membrane component, both by mass and mole fraction. Triacylglycerols and free fatty acids act as phospholipid precursors and are found in low levels in the membrane. Glycerophospholipids replace one fatty acid with a phosphate group, which is often linked to other hydrophilic groups. Cholesterol is present in large amounts and contributes to membrane fluidity and Waxes are present in very small amounts, if at all; they are most prevalent in plants and function in waterproofing and defense. Proteins located within the cell membrane act as transporters, cell adhesion molecules, and Transmembrane proteins can have one or more hydrophobic domains and are most likely to function as receptors or channels. Embedded proteins are most likely part of a catalytic complex or involved in cellular Membrane-associated proteins may act as recognition molecules or enzymes. Carbohydrates can form a protective glycoprotein coat and also function in cell Extracellular ligands can bind to membrane receptors, which function as channels or enzymes in second messenger pathways. Cell-cell junctions regulate transport intracellularly and intercellularly. Gap junctions allow for the rapid exchange of ions and other small molecules between Tight junctions prevent paracellular transport, but do not provide intercellular Desmosomes and hemidesmosomes anchor layers of epithelial tissue together. Concentration gradients help to determine appropriate membrane transport mechanisms Osmotic pressure, a colligative property, is the pressure applied to a pure solvent to prevent osmosis and is used to express the concentration of the solution. It is often better conceptualized as a “sucking” pressure in which a solution is drawing water in, proportional to its concentration. Passive transport does not require energy because the molecule is moving down its concentration gradient or from an area with higher concentration to an area with lower Simple diffusion does not require a transporter. Small, nonpolar molecules passively move from an area of high concentration to an area of low concentration until equilibrium is achieved. Osmosis describes the diffusion of

water across a selectively permeable membrane. Facilitated diffusion uses transport proteins to move impermeable solutes across the cell. Active transport requires energy in the form of ATP or an existing favorable ion gradient. Active transport may be primary or secondary depending on the energy source. Secondary active transport can be further classified as symport or antiport. Endocytosis and exocytosis are methods of engulfing material into cells or releasing material to the exterior of cells, both via the cell membrane. Pinocytosis is the ingestion of liquid into the cell in vesicles formed from the cell membrane and phagocytosis is the ingestion of larger, solid molecules. The composition of cell membranes is fairly consistent; however, there are some cells that contain specialized membranes. Membrane potential is maintained by the sodium–potassium pump and leak channels. The electrical potential created by one ion can be calculated using the Nernst equation. The resting potential of a membrane at physiological temperature can be calculated using the Goldman–Hodgkin–Katz voltage equation, which is derived from the Nernst equation. The mitochondrial membrane differs from the cell membrane: The outer mitochondrial membrane is highly permeable to metabolic molecules and The inner mitochondrial membrane surrounds the mitochondrial matrix, where the citric acid cycle produces electrons used in the electron transport chain and where many other enzymes important in cellular respiration are located. The inner mitochondrial membrane also does not contain cholesterol.

Answers to Concept Checks

1. Flippases are responsible for the movement of phospholipids between the layers of the plasma membrane because it is otherwise energetically unfavorable. Lipid rafts are aggregates of specific lipids in the membrane that function as attachment points for other biomolecules and play roles in signaling.
2. Lipids, including phospholipids, cholesterol, and others, are most plentiful; proteins, including transmembrane proteins (channels and receptors), membrane-associated proteins, and embedded proteins, are next most plentiful; carbohydrates, including the glycoprotein coat and signaling molecules, are next; nucleic acids are essentially absent.

1. The hydrophilic region is at the top of this diagram. While you need not be able to recognize it, the head group is phosphatidylcholine in this example. The

hydrophobic region is at the bottom and is composed of two fatty acid tails. The tail on the left is saturated; the tail on the right is unsaturated, as evidenced by the kink in its chain. 2. Cholesterol moderates membrane fluidity by interfering with the crystal structure of the cell membrane and occupying space between phospholipid molecules at low temperatures, and by restricting excessive movement of phospholipids at high temperatures. Cholesterol also provides stability by cross-linking adjacent phospholipids through interactions at the polar head group and hydrophobic interactions at the nearby fatty acid tail. 3. Transmembrane proteins are most likely to serve as channels or receptors. Embedded membrane proteins are most likely to have catalytic activity linked to nearby enzymes. Membrane-associated (peripheral) proteins are most likely to be involved in signaling or are recognition molecules on the extracellular surface. 4. Gap junctions allow for the intercellular transport of materials and do not prevent paracellular transport of materials. Tight junctions are not used for intercellular transport but do prevent paracellular transport. Gap junctions are in discontinuous bunches around the cell, while tight junctions form bands around the cell. 1. The primary thermodynamic factor responsible for passive transport is entropy. 2. As osmotic pressure increases, more water will tend to flow into the compartment to decrease solute concentration. Osmotic pressure is often considered a "sucking" pressure because water will move toward the compartment with the highest osmotic pressure. 3. Primary active transport uses ATP as an energy source for the movement of molecules against their concentration gradient, while secondary active transport uses an electrochemical gradient to power the transport. Symport moves both particles in secondary active transport across the membrane in the same direction, while antiport moves particles across the cell membrane in opposite directions. 1. The membrane potential, which results from a difference in the number of positive and negative charges on either side of the membrane, is maintained primarily by the sodium–potassium pump, which moves three sodium ions out of the cell for every two potassium ions pumped in, and to a minor extent by leak channels that allow the passive transport of ions. The exact value is 64.0 mV 3. The inner mitochondrial membrane lacks

cholesterol, which differentiates it from most other biological membranes. There is no pH gradient between the cytoplasm and the intermembrane space because the outer mitochondrial membrane has such high permeability to biomolecules (the proton-motive force of the mitochondria is across the inner mitochondrial membrane, not the outer mitochondrial membrane).

Science Mastery Assessment Explanations We are asked to identify the type of transport that would allow a large, polar molecule to cross the membrane without any energy expenditure. This scenario describes facilitated diffusion, which  $V_m = 61.5 \log \left[ \frac{0.05 \times [14] + 1 \times [120] + 0 \times [120]}{120.7} \right] = 61.5 \log \left[ \frac{120.7}{120.7} \right] = 61.5 \log 1 = 0 \text{ mV}$  uses a transport protein (or channel) to facilitate the movement of large, polar molecules across the nonpolar, hydrophobic membrane. Facilitated diffusion, like simple diffusion, does not require energy.

This question requires an understanding of osmosis and the action of the sodium–potassium pump. When a cell is placed in a hypertonic solution (a solution having a higher solute concentration than the cell), fluid will diffuse out of the cell and result in cell shrinkage. When a cell is placed in hypotonic solution (a solution having a lower solute concentration than the cell), fluid will diffuse from the solution into the cell, causing the cell to expand and possibly lyse. The sodium–potassium pump moves three sodium ions out of the cell for every two potassium ions it lets into the cell. Therefore, inhibition of the sodium–potassium pump by ouabain will cause a net increase in the sodium concentration inside the cell and water will diffuse in, causing the cell to swell and then lyse. The polarization of the membrane at rest is the result of an uneven distribution of ions between the inside and outside of the cell. This difference is achieved through active pumping of ions (predominantly sodium and potassium) into and out of the cell and the selective permeability of the membrane, which allows only certain ions to cross. Ribosomes are the site of protein synthesis within a cell and are not coupled to the cell membrane. The cell membrane functions as a site for cytoskeletal attachment, (A), through proteins and lipid rafts. Transport regulation, (C), is accomplished through channels, transporters, and selective permeability, while the phospholipids act as a reagent for second messenger formation, (D). Movement of individual molecules in the cell



membrane will be affected by size and polarity, just as with diffusion. Lipids are much smaller than proteins in the plasma membrane and will move more quickly. Lipids will move fastest within the plane of the cell membrane because the polar head group does not need to pass through the hydrophobic tail region in the same way that it would if it were moving between the membrane layers. Compounds that contribute to membrane fluidity will lower the melting point or disrupt the crystal structure. Cholesterol, (C), and unsaturated lipids, (A) and (D), are known for these functions. trans glycerophospholipids tend to increase the melting point of the membrane and therefore decrease membrane fluidity. Membrane receptors must have both an extracellular and intracellular domain; therefore, they are considered transmembrane proteins. In order to initiate a second messenger cascade, they typically display enzymatic activity, although some may act strictly as channels. Plasmodesmata are cell-cell junctions that are found in plants, not animals. Gap junctions, tight junctions, desmosomes, and hemidesmosomes are all found in animals, particularly in epithelia. The movement of any molecule is dependent on multiple factors, including electric potential, membrane solubility, and concentration gradient. While the electric potential takes into account multiple molecules, the movement of any one solute or water by diffusion or osmosis is dependent only on the concentration gradient of that molecule. The endocytosis (bulk uptake through vesicle formation) of fluid is known as pinocytosis. Phagocytosis, (A), is the endocytotic intake of solids, while exocytosis, (C), is a method of releasing vesicular contents. Drinking, (D), does not apply on a cellular level. Cell membranes are most likely to have a resting membrane potential that is nonzero because the resting membrane potential creates a state that is capable of responding to stimuli. Signaling molecules and channels would not be as useful with a membrane potential of zero. The values given in the answer choices correspond to different stages of the action potential, but the key information is that a resting potential of 0 mV does not maintain gradients for later activity. The outer mitochondrial membrane is very permeable while the inner membrane is highly impermeable. The inner mitochondrial membrane is unique within the cell because it lacks The Nernst equation relates the intra- and extracellular

concentrations of an ion to the potential created by that gradient. At physiological temperature, it can be simplified to  $E = 61.5 \frac{RT}{zF} \log \frac{[\text{ion}]_{\text{outside}}}{[\text{ion}]_{\text{inside}}}$ . For calcium,  $z = +2$  ( $\text{Ca}^{2+}$ ) and the ratio of  $[\text{ion}]_{\text{outside}}$  to  $[\text{ion}]_{\text{inside}} = 104$ . Plugging in, we get:  $E = 61.5 \frac{RT}{zF} \log 104 = 61.5 \frac{RT}{zF} \times 4 = 123 \text{ mV}$

The fluid mosaic model accounts for a dynamic membrane. In this model, membrane components contain both fatty and carbohydrate-derived components, eliminating (B). Further, the membrane is stabilized by the hydrophobic interactions of both fatty acid tails and membrane proteins, which may be found on the cytosolic or extracellular side of the membrane, or may run directly through the membrane; thus, (C) and (D) are also eliminated. Gangliosides, along with ceramide, sphingomyelin, and cerebroside, are sphingolipids. Consult your online resources for additional practice.

Equations to Remember

(8.1) Osmotic pressure:  $\Pi = iMRT$

(8.2) Nernst equation:  $E = \frac{RT}{zF} \ln \frac{[\text{ion}]_{\text{outside}}}{[\text{ion}]_{\text{inside}}} = 61.5 \frac{RT}{zF} \log \frac{[\text{ion}]_{\text{outside}}}{[\text{ion}]_{\text{inside}}}$

(8.3) Goldman–Hodgkin–Katz voltage equation:  $V_m = 61.5 \log \left[ \frac{P_{\text{Na}^+} \times [\text{Na}^+]_{\text{outside}} + P_{\text{K}^+} \times [\text{K}^+]_{\text{outside}} + P_{\text{Cl}^-} \times [\text{Cl}^-]_{\text{inside}}}{P_{\text{Na}^+} \times [\text{Na}^+]_{\text{inside}} + P_{\text{K}^+} \times [\text{K}^+]_{\text{inside}} + P_{\text{Cl}^-} \times [\text{Cl}^-]_{\text{outside}}} \right]$

Biochemistry Chapter 3 Nonenzymatic Protein Function and Protein Analysis  
 Biochemistry Chapter 5 Lipid Structure and Function  
 Biology Chapter 1 Biology  
 Chapter 10 General Chemistry Chapter 9 Physics and Math Chapter 5 Carbohydrate Metabolism I: Gluconeogenesis, and the Pentose Phosphate Pathway

Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate.

How to Use This Assessment

If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes

throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one. If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect. If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. Which of the following transporters is used by cells in the liver to store excess glucose and by beta cells in the pancreas as a A. GLUT 1 B. GLUT 2 C. GLUT 3 D. GLUT 4
2. Which of the following organs does NOT require a constant supply of glucose from the blood for energy during a fast? A. Red blood cells
3. When insulin is released, it acts to increase the absorption of glucose into skeletal muscle predominantly through which of the A. GLUT 1 B. GLUT 2 C. GLUT 3 D. GLUT 4
4. After an overnight fast, which of the following enzymes would be expected to have little, if any, physiological activity? A. Malate dehydrogenase C.  $\alpha$ -Ketoglutarate dehydrogenase
5. Which of the following enzymes is NOT used to trap sugar in the
6. When fatty acid  $\beta$ -oxidation predominates in the liver, mitochondrial pyruvate is most likely to be: A. carboxylated to phosphoenolpyruvate for entry into B. oxidatively decarboxylated to acetyl-CoA for oxidation in the citric acid cycle. C. carboxylated to oxaloacetate for entry into gluconeogenesis. D. reduced to lactate in the process of fermentation.
7. A biopsy is done on a child with an enlarged liver and shows accumulation of glycogen granules with single glucose residues remaining at the branch points near the periphery of the granule. The most likely genetic defect is in the gene encoding: A.  $\alpha$ -1,4 phosphorylase (glycogen phosphorylase). B.  $\alpha$ -1,4: $\alpha$ -1,6 transferase (branching enzyme). C.  $\alpha$ -1,4: $\alpha$ -1,4 transferase (part of debranching enzyme D.  $\alpha$ -1,6 glucosidase (part of debranching enzyme complex).
8. An investigator is measuring the

activity of various enzymes involved in reactions of intermediary metabolism. One of the enzymes has greatly decreased activity compared to reference values. The buffer of the assay contains citrate. Which of the following enzymes will most likely be directly affected by the use of B. Isocitrate dehydrogenase D. Pyruvate carboxylase

9. After a brief period of intense exercise, the activity of muscle pyruvate dehydrogenase is greatly increased. This increased activity is most likely due to: A. decreased ADP. B. increased acetyl-CoA. C. increased NADH/NAD<sup>+</sup> ratio. D. increased pyruvate concentration.

10. The metabolism of which of the following sugars would be LEAST affected by the inhibition of the enzyme phosphofructokinase-1?

11. A patient is given antibiotics to treat a urinary tract infection and develops an episode of red blood cell lysis. Further studies show weakness of the plasma membrane and Heinz bodies (collections of oxidized hemoglobin). Which of the following enzymes is most likely defective in this patient? B. Glucose-6-phosphate dehydrogenase D. Pyruvate kinase

12. The unique enzymes of gluconeogenesis are used to circumvent specific irreversible steps of glycolysis. Which of the following correctly pairs an enzyme from glycolysis with its corresponding enzyme(s) used in gluconeogenesis? B. Pyruvate dehydrogenase/pyruvate carboxylase and D. Pyruvate kinase/glucose-6-phosphatase

13. After an overnight fast, which of the following processes would be expected to occur at an elevated rate compared with the well-fed D. Glycerol synthesis

14. Andersen disease is caused by a mutation in branching enzyme and is associated with cirrhosis. Scientists theorize the cause is likely an immune response against abnormal glycogen. Which of the following best describes the ratio of glycogen  $\alpha$ -1,4 to  $\alpha$ -1,6 linkages in individuals with this disorder? C. No difference D. Cannot determine

15. Each of the following catalyzes a rate-limiting step of a carbohydrate metabolism pathway EXCEPT: B. glycogen synthase. C. glucose-6-phosphate dehydrogenase.

Carbohydrate Metabolism I: Gluconeogenesis, and the Pentose Phosphate Pathway

In This Chapter

9.1 Glucose Transport

Important Enzymes of Glycolysis

Important Intermediates of Glycolysis

Glycolysis in Erythrocytes

9.3 Other Monosaccharides

9.4 Pyruvate Dehydrogenase

9.5 Glycogenesis and Glycogenolysis

Glycogen Storage Diseases

Important Enzymes of Gluconeogenesis

9.7 The

Pentose Phosphate Pathway Functions of NADPH The content in this chapter should be relevant to about 5% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories: 1D: Principles of bioenergetics and fuel molecule metabolism 5D: Structure, function, and reactivity of biologically-relevant molecules

Maintaining a constant blood glucose concentration around dL (5.6 mM) is of the utmost importance in the body: high blood sugar causes long-term damage to the retina, kidney, blood vessels, and nerves, while low blood sugar can cause autonomic disturbances, seizures, and even coma. Without the ability to take in glucose constantly, the body must find ways to store and release glucose as it is needed. And given the variety of food we eat on a daily basis, the body must find ways to use all of the various carbohydrates it takes in. There's a complex interplay between the neurological, endocrine, digestive, and excretory systems to maintain this blood glucose concentration, much of which is discussed in Chapter 12 of MCAT Biochemistry Review. In this chapter, we'll take a look at the metabolic pathways that involve glucose: the methods by which our bodies digest glucose and other monosaccharides, store and release glucose for energy, generate glucose from other biomolecules, and use glucose to create some of the coenzymes and substrates needed for biosynthesis. This chapter is the first of four that focus on metabolism in MCAT Biochemistry Review. Here, we focus on metabolic processes of glucose that do not require oxygen; in Chapter 10, we'll turn our focus to the processes that only occur under aerobic conditions. In Chapter 11, we'll explore the metabolism of lipids and amino acids. Finally, in Chapter 12, we'll bring all of metabolism together with a focus on bioenergetics and the regulation of

### 9.1 Glucose Transport

After Chapter 9.1, you will be able to:

- List the locations and functions of the GLUT 2 and GLUT 4 glucose transport
- Predict how increased blood glucose levels will impact GLUT 2 and GLUT 4 activity

Glucose entry into most cells is driven by concentration and is independent of sodium, unlike absorption from the digestive tract. Normal glucose concentration in peripheral blood is 5.6 mM (normal range: 4–6 mM). There are four glucose transporters, called GLUT 1 through GLUT 4. GLUT 2 and GLUT 4 are the most significant of these because they are located only in

specific cells and are highly regulated. The  $K_m$  is the concentration of substrate when an enzyme is active at half of its maximum velocity ( $v_{max}$ ). The lower the  $K_m$ , the higher the enzyme's affinity for the substrate. See Chapter 2 of MCAT Biochemistry Review for more on Michaelis-Menten enzyme kinetics. GLUT 2 is a low-affinity transporter in hepatocytes and pancreatic cells. After a meal, blood traveling through the hepatic portal vein from the intestine is rich in glucose. GLUT 2 captures the excess glucose primarily for storage. When the glucose concentration drops below the  $K_m$  for the transporter, much of the remainder bypasses the liver and enters the peripheral circulation. The  $K_m$  of GLUT 2 is quite high (15 mM). This means that the liver will pick up glucose in proportion to its concentration in the blood (first-order kinetics). In other words, the liver will pick up excess glucose and store it preferentially after a meal, when blood glucose levels are high. In the  $\beta$ -islet cells of the pancreas, GLUT 2, along with the glycolytic enzyme glucokinase, serves as the glucose sensor for insulin. GLUT 4 is in adipose tissue and muscle and responds to the glucose concentration in peripheral blood. The rate of glucose transport in these two tissues is increased by insulin, which stimulates the movement of additional GLUT 4 transporters to the membrane by a mechanism involving exocytosis, as shown in Figure 9.1. The  $K_m$  of GLUT 4 is close to the normal glucose levels in blood (5 mM). This means that the transporter is saturated when blood glucose levels are just a bit higher than normal. When a person has high blood sugar concentrations, these transporters will still permit only a constant rate of glucose influx because they will be saturated (zero-order kinetics). Then how can cells with GLUT 4 transporters increase their intake of glucose? By increasing the number of GLUT 4 transporters on their surface. Figure 9.1 Insulin Regulation of Glucose Transport in Muscle and Adipose Cells Diabetes mellitus is caused by a disruption of the insulin/GLUT 4 mechanism. In type 1 diabetes, insulin is absent and cannot stimulate the insulin receptor. In type 2 diabetes, the receptor becomes insensitive to insulin and fails to bring GLUT 4 transporters to the cell surface. In both cases, blood glucose rises, leading to immediate symptoms (increased urination, increased thirst, ketoacidosis) and long-term symptoms (blindness, heart attacks,

strokes, nerve damage). Although basal levels of transport occur in all cells independently of insulin, the transport rate increases in adipose tissue and muscle when insulin levels rise. Muscle stores excess glucose as glycogen, and adipose tissue requires glucose to form dihydroxyacetone phosphate (DHAP), which is converted to glycerol phosphate to store incoming fatty acids as triacylglycerols. MCAT CONCEPT CHECK 9.1 Before you move on, assess your understanding of the material with these questions. 1. Compare and contrast GLUT 2 and GLUT 4: Saturated at normal glucose levels? Responsive to insulin? 2. How does insulin promote glucose entry into cells? BIOCHEMISTRY GUIDED EXAMPLE WITH EXPERT

Malignant cells increase their expression of glycolytic enzymes and glucose uptake to markedly enhance glycolysis (aerobic glycolysis; the Warburg effect), which leads to the production of a large amount of ATP and biomolecules such as nucleic acids and lipids essential for cell survival and division. In order to clarify the role of glycolysis in ATP production in malignant and normal cells, the intracellular levels of ATP were measured upon treatment with the hexokinase II inhibitor 3BrPA at 10, 30, and 50  $\mu$ M, in malignant RPMI8226 multiple myeloma (MM) cells. Data were expressed relative to values for untreated cells (Figure 1). MM cells are known to reside in the bone marrow with normal hematopoietic cells. To compare the effects of inhibiting glycolysis on ATP production between malignant and normal cells, CD138<sup>+</sup> primary MM cells and CD138 non-MM bone marrow mononuclear cells (BMMCs) were cultured for 60 minutes with 50  $\mu$ M of 3BrPA, and cellular levels of ATP were measured (Figure 2). Finally, to evaluate the effects of 3BrPA on cell viability, RPMI8226 and peripheral blood mononuclear cells (PBMCs), which are non-MM, were cultured for 24 hours with 3BrPA at the indicated concentrations. The cells were stained with propidium iodide (PI), which binds more

This intro is research, so it'll only be helpful if there are questions on the broader context of explain role of glycolysis to make ATP in cancerous and normal cells With all of the acronyms in the passage it'll be helpful to replace them mentally with simpler words and add notes to your scratch board: 3BrPA Fig 2: same as Fig 1, intensely to non-viable cells, and analyzed by flow cytometry (Figure 3). but comparing to Replace CD138<sup>+</sup> with This

indicates what “new” thing is coming in the next inhibitor added to cancer and normal The dye will pick up IVs: concentration of DV: ATP levels Trend: as glycolysis inhibitor conc goes up, ATP levels decrease in cancer IVs: cancer vs. normal cell type, DV: ATP levels inhibitor lowers ATP levels more in cancer cells compared to Two sets of graphs, though we can essentially make it IVs: normal vs. DVs: levels of dead Trend: the glycolytic inhibitor kills off more cancer cells compared to normal Adapted from Nakano, A., Tsuji, D., Miki, H., Cui, Q., El Sayed, S. M., Ikegame, A., ... Abe, M. (2011). Glycolysis inhibition inactivates ABC transporters to restore drug sensitivity in malignant cells. PLoS One, 6(11), e27222. According to the data, do the results support the usage of glycolytic inhibitors like 3BrPA to preferentially target malignant cells? Why or why not? This question is going to require us to understand what this experiment is testing and how the results are gathered, so let’s start by making sure we understand the passage fully. A quick scan of this passage reveals multiple challenges: lots of acronyms, unfamiliar jargon and experimental techniques, and four experimental graphs. While each piece of data will be distinct, they will all be centered around supporting the experiment’s purpose. The second sentence states that the overall purpose of this passage is to explore how cancer cells primarily use glycolysis, and how this preference can be used to specifically target tumors. In Figure 1, we can see what’s happening to ATP levels over time in multiple myeloma cells treated with hexokinase inhibitor. Looking at the data, we see that over time, the bigger the dose (written above the lines) of inhibitor, the more the ATP level in the cancer cells drops. If glycolysis is the primary way cancer cells produce ATP, which is what the passage stated in the first sentence, then the results in Figure 1 can be said to support this hypothesis. Figure 2 shows a comparison of ATP production in the presence and absence of the inhibitor to cancer cells (RPMI8226 and CD138+) and normal cells (CD138). While there is a drop in ATP when treated with the inhibitor in all the cell types, there is a statistical difference in the ATP levels of cancer vs. normal cells when the inhibitor is present. The brackets at the top of this figure indicate a statistically significant difference between the cancer cell line with the inhibitor and normal cell lines with the inhibitor. These kinds of



statistical significance indications in a graph often point us toward where we should be heading to solve passage-based questions on the MCAT. This is the first piece of evidence that shows how inhibiting glycolysis has a bigger effect on cancer cells compared to normal, because we saw a statistically significant difference between those groups. However, the most impactful proof comes in Figure 3. The cells have been treated with PI, which the passage tells us will stain non-viable (dead) cells more intensely. The cancer cells have progressively more dead cells (indicated by higher bars) with increasing amounts of the glycolytic inhibitor, which we can see in the first graph of Figure 3, while the normal cells (the second graph of Figure 3) show far fewer dead cells even at the highest dose. To directly compare, one can estimate that 70% of cancer cells are PI positive with 30  $\mu$ M 3BrPA, whereas 10% of nonmalignant cells are PI positive with the same concentration of 3BrPA. Because the results in Figure 3 tell us that glycolytic inhibitor 3BrPA is far more effective in killing cancerous vs. noncancerous cell lines, the findings are supportive of the idea that 3BrPA could possibly be used to target and treat cancerous cells.

After Chapter 9.2, you will be able to:

- Recall the key steps, key intermediates, reactants, products, and key enzymes of
- Explain the function and mechanism of lactate fermentation
- Explain the unique effects of glycolysis on hemoglobin and erythrocytes
- Recall function and regulatory mechanisms when given an enzyme of glycolysis, such as phosphoglycerate kinase
- Red blood cells extrude their mitochondria during development, as discussed in Chapter 7 of MCAT Biology Review. This helps them carry out their function (carrying oxygen) in two
- Maximizing volume available for hemoglobin, the primary oxygen-carrying protein
- Stopping the red blood cell from utilizing the oxygen it's supposed to be carrying to oxygen-depleted bodily tissues

All cells can carry out glycolysis. In a few tissues, most importantly red blood cells, glycolysis represents the only energy-yielding pathway available because red blood cells lack mitochondria, which are required for the citric acid cycle, electron transport chain, oxidative phosphorylation, and fatty acid metabolism ( $\beta$ -oxidation). Glucose is the major monosaccharide that enters the pathway, but others such as galactose and fructose can also feed. Because glycolysis is necessary in every cell of the

body, there are no known diseases caused by the complete absence of any enzyme in glycolysis; in other words, being unable to carry out glycolysis is incompatible with life. Partial enzyme defects are also rare, but include pyruvate kinase deficiency. Glycolysis is a cytoplasmic pathway that converts glucose into two pyruvate molecules, releasing a modest amount of energy captured in two substrate-level phosphorylations and one oxidation reaction. If a cell has mitochondria and oxygen, the energy carriers produced in glycolysis (NADH) can feed into the aerobic respiration pathway to generate energy for the cell. If either mitochondria or oxygen is lacking (such as in erythrocytes or exercising skeletal muscle, respectively), glycolysis may occur anaerobically, although some of the available energy is lost. Glycolysis also provides intermediates for other pathways. In the liver, glycolysis is part of the process by which excess glucose is converted to fatty acids for storage.

### Important Enzymes of Glycolysis

While glycolysis contains many different steps, as illustrated in Figure 9.2, the MCAT predominantly tests on the enzymes that are highly regulated or that serve an important energetic function. Therefore, we'll focus our attention on five of these enzymes.

#### Figure 9.2 Glycolysis

##### Hexokinase and Glucokinase

The first steps in glucose metabolism in any cell are transport across the membrane and phosphorylation by kinase enzymes inside the cell to prevent glucose from leaving via the transporter. Remember from Chapter 2 of MCAT Biochemistry Review that kinases attach a phosphate group from ATP to their substrates. Glucose enters the cell by facilitated diffusion or active transport; in either case, these kinases convert glucose to glucose 6-phosphate. Because the GLUT transporters are specific for glucose (not phosphorylated glucose), the glucose gets "trapped" inside the cell and cannot leak out. Hexokinase is widely distributed in tissues and is inhibited by its product, glucose 6-phosphate. Glucokinase is found only in liver cells and pancreatic  $\beta$ -islet cells; in the liver, glucokinase is induced by insulin. Table 9.1 identifies the differences between these enzymes. These coincide with the differences between the glucose transporters in these tissues.

Enzyme	Present in	Low
Hexokinase	most tissues	
Glucokinase	hepatocytes and pancreatic $\beta$ -islet cells (along with GLUT 2, acts as the glucose sensor)	

$K_m$  (reaches maximum velocity at low [glucose]) High  $K_m$  (acts on glucose proportionally to its concentration)

Inhibited by glucose 6- Induced by insulin in hepatocytes

Of all the enzymes the MCAT is most likely to test you on, the rate-limiting enzymes for each process are at the top of the list:

Fermentation: lactate dehydrogenase Glycogenesis: glycogen synthase Glycogenolysis: glycogen phosphorylase Pentose Phosphate Pathway: glucose-6-phosphate dehydrogenase

Phosphofructokinases (PFK-1 and PFK-2) Phosphofructokinase-1 (PFK-1) is the rate-limiting enzyme and main control point in glycolysis. In this reaction, fructose 6-phosphate is phosphorylated to fructose 1,6-bisphosphate using ATP. PFK-1 is inhibited by ATP and citrate, and activated by AMP. This makes sense because the cell should turn off glycolysis when it has sufficient energy (high ATP) and turn on glycolysis when it needs energy (high AMP). Citrate is an intermediate of the citric acid cycle, so high levels of citrate also imply that the cell is producing sufficient energy. In Chapter 11 of MCAT General Chemistry Review, we learn that oxidation is loss of electrons and reduction is gain of electrons. While this is true with biomolecules, it may be easier to think of oxidation as increasing bonds to oxygen or other heteroatoms (atoms besides C and H) and reduction as increasing bonds to hydrogen, as discussed in Chapter 4 of MCAT Organic Chemistry Review. Thus, the conversion of  $NAD^+$  to  $NADH$  is a

Insulin stimulates and glucagon inhibits PFK-1 in hepatocytes by an indirect mechanism involving PFK-2 and fructose 2,6-bisphosphate, as shown in Figure 9.2. Insulin activates Phosphofructokinase-2 (PFK-2), which converts a tiny amount of fructose 6-phosphate to fructose 2,6-bisphosphate (F2,6-BP). F2,6-BP activates PFK-1. On the other hand, glucagon inhibits PFK-2, lowering F2,6-BP and thereby inhibiting PFK-1. PFK-2 is found mostly in the liver. By activating PFK-1, it allows these cells to override the inhibition caused by ATP so that glycolysis can continue, even when the cell is energetically satisfied. The metabolites of glycolysis can thus be fed into the production of glycogen, fatty acids, and other storage molecules rather than just being burned to produce ATP.

Glyceraldehyde-3-phosphate dehydrogenase catalyzes an oxidation and addition of inorganic phosphate ( $P_i$ ) to its substrate, glyceraldehyde 3-phosphate. This results in the production of

a high-energy intermediate 1,3- bisphosphoglycerate and the reduction of  $\text{NAD}^+$  to NADH. If glycolysis is aerobic, the NADH can be oxidized by the mitochondrial electron transport chain, providing energy for ATP synthesis by oxidative phosphorylation. 3-Phosphoglycerate kinase transfers the high-energy phosphate from 1,3- bisphosphoglycerate to ADP, forming ATP and 3-phosphoglycerate. This type of reaction, in which ADP is directly phosphorylated to ATP using a high- energy intermediate, is referred to as substrate-level phosphorylation. In contrast to oxidative phosphorylation in mitochondria, substrate-level phosphorylations are not dependent on oxygen, and are the only means of ATP generation in an anaerobic tissue. The last enzyme in aerobic glycolysis, pyruvate kinase catalyzes a substrate- level phosphorylation of ADP using the high-energy substrate phosphoenolpyruvate (PEP). Pyruvate kinase is activated by fructose 1,6- bisphosphate from the PFK-1 reaction. This is referred to as feed-forward activation, meaning that the product of an earlier reaction of glycolysis (fructose 1,6-bisphosphate) stimulates, or prepares, a later reaction in glycolysis (by activating pyruvate kinase). In the absence of oxygen, fermentation will occur. The key fermentation enzyme in mammalian cells is lactate dehydrogenase, which oxidizes NADH to  $\text{NAD}^+$ , replenishing the oxidized coenzyme for glyceraldehyde-3- phosphate dehydrogenase. Without mitochondria and oxygen, glycolysis would stop when all the available  $\text{NAD}^+$  had been reduced to NADH. By reducing pyruvate to lactate and oxidizing NADH to  $\text{NAD}^+$ , lactate dehydrogenase prevents this potential problem from developing. There is no net loss of carbon in this process: pyruvate and lactate are both three-carbon molecules. In aerobic tissues, lactate does not normally form in significant amounts. However, when oxygenation is poor (during strenuous exercise in skeletal muscle, a heart attack, or a stroke), most cellular ATP is generated by anaerobic glycolysis, and lactate production increases. In yeast cells, fermentation is the conversion of pyruvate (three carbons) to ethanol (two carbons) and carbon dioxide (one carbon). While the end products are different, the result of both mammalian and yeast fermentation is the same: replenishing  $\text{NAD}^+$ .

#### Important Intermediates of Glycolysis

Glycolysis serves as a crossroads for a number of metabolic processes; the

intermediates of glycolysis are often used to link different pathways during both catabolism and anabolism. Three of these intermediates are worth Dihydroxyacetone phosphate (DHAP) is used in hepatic and adipose tissue for triacylglycerol synthesis. DHAP is formed from fructose 1,6-bisphosphate. It can be isomerized to glycerol 3-phosphate, which can then be converted to glycerol, the backbone of triacylglycerols. 1,3-Bisphosphoglycerate (1,3-BPG) and phosphoenolpyruvate (PEP) are high-energy intermediates used to generate ATP by substrate-level phosphorylation. This is the only ATP gained in anaerobic respiration. Three enzymes in the pathway catalyze reactions that are irreversible. This keeps the pathway moving in only one direction. However, the liver must be able to generate new glucose from other biomolecules through gluconeogenesis, which is essentially the reverse of glycolysis. Because of the irreversible enzymes of glycolysis, different reactions, and therefore different enzymes, must be used at these three points: Glucokinase or hexokinase Irreversible steps of glycolysis: How Glycolysis Pushes Forward the Process: Kinases. Adaptation to high altitudes (low  $pO_2$ ) involves: Increased oxygen affinity for hemoglobin (initial) Increased rate of glycolysis Increased [2,3-BPG] in RBC (over a 12–24 hour period) Normalized oxygen affinity for hemoglobin restored by the increased level of 2,3-BPG Increased hemoglobin (over days to weeks) Gas exchange is discussed in Chapter 6 of MCAT Biology Review, and effects on hemoglobin are discussed in Chapter 7 of MCAT Biology Review. Glycolysis in Erythrocytes In erythrocytes (red blood cells), anaerobic glycolysis represents the only pathway for ATP production, yielding a net 2 ATP per glucose. Red blood cells have bisphosphoglycerate mutase, which produces 2,3- bisphosphoglycerate (2,3-BPG) from 1,3-BPG in glycolysis. Remember that mutases are enzymes that move a functional group from one place in a molecule to another; in this case, the phosphate is moved from the 1- position to the 2-position. 2,3-BPG binds allosterically to the  $\beta$ -chains of hemoglobin A (HbA) and decreases its affinity for oxygen. This effect of 2,3- BPG is seen in the oxygen dissociation curve for HbA, shown in Figure 9.3. The rightward shift in the curve is sufficient to allow unloading of oxygen in tissues, but still allows 100 percent saturation in the lungs. An abnormal increase in

erythrocyte 2,3-BPG might shift the curve far enough so that HbA is not fully saturated in the lungs. Figure 9.3 Effect of 2,3-Bisphosphoglycerate on Hemoglobin A Remember the other physiological changes that promote a right shift of the oxygen dissociation curve (the Bohr effect), discussed in Chapter 7 of MCAT Biology Review: These all occur during exercise, giving the mnemonic: "Exercise is the right thing to do." Although 2,3-BPG binds to HbA, it does not bind well to fetal hemoglobin (HbF), with the result that HbF has a higher affinity for oxygen than maternal HbA. This allows transplacental passage of oxygen from mother to MCAT

CONCEPT CHECK 9.2 Before you move on, assess your understanding of the material with these questions. 1. What are the function and key regulators of the following enzymes? Which ones are 2. Why must pyruvate undergo fermentation for glycolysis to continue? 3. Why is it necessary that fetal hemoglobin does not bind 2,3-BPG?

9.3 Other Monosaccharides After Chapter 9.3, you will be able to: Explain the importance of trapping a sugar in the cell and linking its metabolism with the glycolysis pathway Recognize the key enzymes, reactants, and products of galactose and fructose While glucose represents the primary monosaccharide used by cells, other monosaccharides such as galactose and fructose can also contribute to ATP production by feeding into glycolysis or other metabolic processes. These monosaccharides are tested far less frequently than glucose on the MCAT, but are included here to compare and contrast their metabolism with glycolysis. In particular, notice the similarities between Figure 9.2 (glycolysis) and Figures 9.4 (galactose metabolism) and 9.5 (fructose Figure 9.4 Galactose Metabolism Figure 9.5 Fructose Metabolism An important source of galactose in the diet is the disaccharide lactose present in milk. Lactose is hydrolyzed to galactose and glucose by lactase, which is a brush-border enzyme of the duodenum. Along with other monosaccharides, galactose reaches the liver through the hepatic portal vein. Once transported into tissues, galactose is phosphorylated by galactokinase, trapping it in the cell. The resulting galactose 1-phosphate is converted to glucose 1-phosphate by galactose-1-phosphate uridylyltransferase and an epimerase. Epimerases are enzymes that catalyze the conversion of one sugar epimer to another;

remember from Chapter 4 of MCAT Biochemistry Review that epimers are diastereomers that differ at exactly one chiral carbon. The pathway is shown in Figure 9.4; important enzymes to remember are: Primary lactose intolerance is caused by a hereditary deficiency of lactase. Secondary lactose intolerance can be precipitated at any age by gastrointestinal disturbances that cause damage to the intestinal lining, where lactase is found. Common symptoms of lactose intolerance include vomiting, bloating, explosive and watery diarrhea, cramps, and dehydration. The symptoms can be attributed to bacterial fermentation of lactose, which produces a mixture of  $\text{CH}_4$ ,  $\text{H}_2$ , and small organic acids. The acids are osmotically active and result in the movement of water into the intestinal lumen. Fructose is found in honey and fruit and as part of the disaccharide sucrose (common table sugar). Sucrose is hydrolyzed by the duodenal brush-border enzyme sucrase, and the resulting monosaccharides, glucose and fructose, are absorbed into the hepatic portal vein. The liver phosphorylates fructose using fructokinase to trap it in the cell. The resulting fructose 1-phosphate is then cleaved into glyceraldehyde and DHAP by aldolase B. Smaller amounts are metabolized in renal proximal tubules. The pathway is shown in Figure Genetic deficiencies of galactokinase or galactose-1-phosphate uridylyltransferase lead to galactosemia. Cataracts are a characteristic finding, which result from the conversion of excess galactose in the blood to galactitol in the lens of the eye by aldose reductase. Galactitol is a polyol (a carbon chain with many alcohol groups) and, as such, is hydrophilic. Accumulation of galactitol in the lens causes osmotic damage and cataracts. Deficiency of galactose-1-phosphate uridylyltransferase is more severe because, in addition to causing galactosemia, it leads to galactose 1-phosphate getting stuck intracellularly in the liver, brain, and other tissues and not diffusing out. Because dihydroxyacetone phosphate (DHAP) and glyceraldehyde, the products of fructose metabolism, are downstream from the key regulatory and rate-limiting enzyme of glycolysis (PFK-1), a high-fructose drink supplies a quick source of energy in both aerobic and

MCAT

CONCEPT CHECK 9.3 Before you move on, assess your understanding of the material with these questions. 1. Which enzyme is responsible for trapping galactose in the cell? What

enzyme in galactose metabolism results in a product that can feed directly into glycolysis, linking the two pathways? 2. Which enzyme is responsible for trapping fructose in the cell? What enzyme in fructose metabolism results in a product that can feed directly into glycolysis, linking the two pathways?

### 9.4 Pyruvate Dehydrogenase

After Chapter 9.4, you will be able to:

- Recall the reactants and products of the pyruvate dehydrogenase complex
- Describe the relationship between acetyl-CoA levels and PDH activity

Pyruvate from aerobic glycolysis enters mitochondria, where it may be converted to acetyl-CoA for entry into the citric acid cycle if ATP is needed, or for fatty acid synthesis if sufficient ATP is present. The pyruvate dehydrogenase complex (PDH) reaction, shown in Figure 9.6, is irreversible and cannot be used to convert acetyl-CoA to pyruvate or to glucose. Pyruvate dehydrogenase in the liver is activated by insulin, whereas in the nervous system, the enzyme is not responsive to hormones. This makes sense because high insulin levels signal to the liver that the individual is in a well-fed state; thus, the liver should not only burn glucose for energy, but shift the fatty acid equilibrium toward production and storage, rather than oxidation (fatty acid synthesis, discussed in Chapter 11 of MCAT Biochemistry Review, starts from citrate produced in the citric acid cycle).

### Figure 9.6 Pyruvate Dehydrogenase

A deficiency in thiamine (vitamin B1) can result in: Beriberi, which is characterized by congestive heart failure or nerve damage. Wernicke–Korsakoff syndrome, which is characterized by difficulty walking, uncoordinated eye movements, confusion, and memory disturbances. Giving glucose to an individual with thiamine deficiency can lead to severe lactic acidosis and other metabolic derangements because pyruvate cannot be converted into acetyl-CoA without the vitamin. This is why thiamine must be given before an infusion of glucose in individuals suspected to have thiamine deficiency (such as alcoholics). Pyruvate dehydrogenase is actually a complex of enzymes carrying out multiple reactions in succession. The details of each of these reactions are covered in Chapter 10 of MCAT Biochemistry Review, but an overview of the enzyme is provided here because it represents one of three possible fates of pyruvate: conversion to acetyl-CoA by PDH, conversion to lactate by lactate dehydrogenase, or conversion to



oxaloacetate by pyruvate carboxylase. This large complex requires multiple cofactors and coenzymes, including thiamine pyrophosphate, lipoic acid, CoA, FAD, and NAD<sup>+</sup>. Insufficient amounts of any of these cofactors or coenzymes can result in metabolic Pyruvate dehydrogenase is inhibited by its product acetyl-CoA. This control is important in several contexts and should be considered along with pyruvate carboxylase, the other mitochondrial enzyme that uses pyruvate (introduced in gluconeogenesis, later in this chapter). Essentially, the buildup of acetyl-CoA (which happens during  $\beta$ -oxidation) causes a shift in metabolism: pyruvate is no longer converted into acetyl-CoA (to enter the citric acid cycle), but rather into oxaloacetate (to enter gluconeogenesis).

MCAT CONCEPT CHECK 9.4 Before you move on, assess your understanding of the material with these questions.

1. What are the reactants of the pyruvate dehydrogenase complex? What are the products?
2. How does acetyl-CoA affect PDH complex activity? Why?

### 9.5 Glycogenesis and Glycogenolysis

After Chapter 9.5, you will be able to:

- Recall the key enzymes, reactants, and products in glycogenesis and glycogenolysis
- Describe the features of glycogen storage diseases
- Recognize the structural features of glycogen and the major glycosidic links within a glycogen

A glycogen, a branched polymer of glucose, represents a storage form of glucose. Glycogen synthesis and degradation occur primarily in liver and skeletal muscle, although other tissues store smaller quantities. Glycogen is stored in the cytoplasm as granules. Each granule has a central protein core with polyglucose chains radiating outward to form a sphere, as shown in Figure 9.7. Glycogen granules composed entirely of linear chains have the highest density of glucose near the core. If the chains are branched, the glucose density is highest at the periphery of the granule, allowing more rapid release of glucose on demand.

**Figure 9.7 A Glycogen Granule** The glycogen in the liver and in skeletal muscle serve two quite different roles. Liver glycogen is broken down to maintain a constant level of glucose in the blood; muscle glycogen is broken down to provide glucose to the muscle during vigorous exercise. Glycogen stored in the liver is a source of glucose that is mobilized between meals to prevent low blood sugar, whereas muscle glycogen is stored as an energy reserve for muscle contraction. While our focus is on human metabolism, it is worth

mentioning that plants also store excess glucose in long  $\alpha$ -linked chains of glucose called starch, as seen in Figure 9.8. Figure 9.8 Potatoes and Potato Starch Glycogenesis is the synthesis of glycogen granules. It begins with a core protein called glycogenin. As shown in Figure 9.9, glucose addition to a granule begins with glucose 6-phosphate, which is converted to glucose 1-phosphate. This glucose 1-phosphate is then activated by coupling to a molecule of uridine diphosphate (UDP), which permits its integration into the glycogen chain by glycogen synthase. This activation occurs when glucose 1-phosphate interacts with uridine triphosphate (UTP), forming UDP-glucose and a pyrophosphate (PPi). Figure 9.9 Glycogen Metabolism Glycogen synthase is the rate-limiting enzyme of glycogen synthesis and forms the  $\alpha$ -1,4 glycosidic bond found in the linear glucose chains of the granule. It is stimulated by glucose 6-phosphate and insulin. It is inhibited by epinephrine and glucagon through a protein kinase cascade that phosphorylates and inactivates the enzyme. Branching Enzyme (Glycosyl  $\alpha$ -1,4: $\alpha$ -1,6 Transferase) Branching enzyme is responsible for introducing  $\alpha$ -1,6-linked branches into the granule as it grows. The process by which the branch is introduced is shown schematically in Figure 9.10. Branching enzyme: Figure 9.10 Branching Enzyme Hydrolyzes one of the  $\alpha$ -1,4 bonds to release a block of oligoglucose (a few glucose molecules bonded together in a chain), which is then moved and added in a slightly different location. Forms an  $\alpha$ -1,6 bond to create a branch.  $\alpha$ -1,4 keeps the same branch moving "4ward";  $\alpha$ -1,6 (one-six) "puts a branch in the mix." The rate-limiting enzyme of glycogenolysis, the process of breaking down glycogen, is glycogen phosphorylase. In contrast to a hydrolase, a phosphorylase breaks bonds using an inorganic phosphate instead of water. The glucose 1-phosphate formed by glycogen phosphorylase is converted to glucose 6-phosphate by the same mutase used in glycogen synthesis, as shown in Figure 9.9. Under the pressure of Test Day, it can be easy to misread words. When given a passage or question about carbohydrate metabolism, be sure you focus so you can distinguish between glycolysis, glycogenesis, glycogenolysis, and gluconeogenesis. Glycogen phosphorylase breaks  $\alpha$ -1,4 glycosidic bonds, releasing glucose 1-phosphate from the periphery of the granule. It cannot break  $\alpha$ -1,6 bonds and therefore stops

when it nears the outermost branch points. Glycogen phosphorylase is activated by glucagon in the liver, so that glucose can be provided for the rest of the body. In skeletal muscle, it is activated by AMP and epinephrine, which signal that the muscle is active and requires more glucose. It is inhibited by ATP. Debranching Enzyme (Glucosyl  $\alpha$ -1,4: $\alpha$ -1,4 Transferase and  $\alpha$ -1,6 Glucosidase) Debranching enzyme is a two-enzyme complex that deconstructs the branches in glycogen that have been exposed by glycogen phosphorylase. The two-step process by which this occurs is diagrammed in Figure 9.11. Figure 9.11 Debranching Enzyme Breaks an  $\alpha$ -1,4 bond adjacent to the branch point and moves the small oligoglucose chain that is released to the exposed end of the chain. Forms a new  $\alpha$ -1,4 bond. Hydrolyzes the  $\alpha$ -1,6 bond, releasing the single residue at the branch point as free glucose. This represents the only free glucose produced directly in glycogenolysis (as opposed to the glucose produced from glucose 1-phosphate, which must be converted by a mutase to glucose 6-phosphate before it can be converted to glucose via the enzyme). Debranching enzyme is actually made up of two enzymes with different functions: one moves the terminal end of a glycogen chain to the branch point ( $\alpha$ -1,4: $\alpha$ -1,4 transferase), and one removes the glucose monomer actually present at the branch point ( $\alpha$ -1,6 glucosidase). The most common glycogen storage disease is von Gierke's disease, a defect in glucose-6-phosphatase. Because this enzyme is also the last step of gluconeogenesis, this process is also affected, leading to periods of extremely low blood sugar between meals. These patients therefore need continuous feeding with carbohydrates to maintain blood sugar. With the buildup of glucose 6-phosphate in liver cells, the liver enlarges and is damaged.

### Glycogen Storage Diseases

There are a number of genetic deficiencies that can impact the metabolism of glycogen. The clinical features of a metabolic glycogen defect depend on a few important factors: which enzyme is affected, the degree to which that enzyme's activity is decreased, and which isoform of the enzyme is affected. Isoforms are slightly different versions of the same protein; in the case of glycogen enzymes, there are often different isoforms of the enzymes in the liver and muscle. These deficiencies are termed glycogen storage diseases because all are characterized by accumulation or lack of glycogen

in one or MCAT CONCEPT CHECK 9.5 Before you move on, assess your understanding of the material with these questions. 1. What is the structure of glycogen? What types of glycosidic links exist in a glycogen 2. What are the two main enzymes of glycogenesis, and what does each accomplish? 3. What are the two main enzymes of glycogenolysis, and what does each accomplish?

After Chapter 9.6, you will be able to: Recognize the conditions that favor gluconeogenesis Recall the four enzymes unique to gluconeogenesis, and relate them to the enzymes that catalyze the opposite process in glycolysis Detail the regulatory role of acetyl-CoA in the metabolism of pyruvate The liver maintains glucose levels in blood during fasting through either glycogenolysis or gluconeogenesis. The kidney can also carry out gluconeogenesis, although its contribution is much smaller. These pathways are promoted by glucagon and epinephrine, which act to raise blood sugar levels, and are inhibited by insulin, which acts to lower blood sugar levels. During fasting, glycogen reserves drop dramatically in the first 12 hours, during which time gluconeogenesis increases. After 24 hours, it represents the sole source of glucose. Important substrates for gluconeogenesis are: Insulin acts to lower blood sugar levels; the counterregulatory hormones, which include glucagon, epinephrine, cortisol, and growth hormone, act to raise blood sugar levels by stimulating glycogenolysis and gluconeogenesis. The regulation of metabolism is discussed in Chapter 12 of MCAT Biochemistry Review. Glycerol 3-phosphate (from stored fats, or triacylglycerols, in adipose tissue) Lactate (from anaerobic glycolysis) Glucogenic amino acids (from muscle proteins) The last item of this list merits some explaining. Amino acids can be subclassified as glucogenic, ketogenic, or both. Glucogenic amino acids (all except leucine and lysine) can be converted into intermediates that feed into gluconeogenesis, while ketogenic amino acids can be converted into ketone bodies, which can be used as an alternative fuel, particularly during periods of prolonged starvation. See Chapter 11 of MCAT Biochemistry Review for more information on amino acid and protein metabolism. Amino acids and proteins are extremely important topics for the MCAT. Check out Chapter 1 of MCAT Biochemistry Review for more information on amino acids, peptides, and proteins. Dietary fructose and galactose can also

be converted to glucose in the liver, as described earlier in this chapter. In humans, while glucose is converted into acetyl-CoA through glycolysis and pyruvate dehydrogenase, it is not possible to convert acetyl-CoA back to glucose. Because most fatty acids are metabolized solely to acetyl-CoA, they are not a major source of glucose either. One minor exception is fatty acids with an odd number of carbon atoms (for example, fatty acid tails containing 17 carbons), which yield a small amount of propionyl-CoA, which is glucogenic. The pathway of gluconeogenesis is diagrammed in Figure 9.12. Each of the important gluconeogenic intermediates—lactate, alanine, and glycerol 3-phosphate—have enzymes that convert them into glycolytic intermediates.

**Figure 9.12 Gluconeogenesis**

Lactate is converted to pyruvate by lactate dehydrogenase. Alanine is converted to pyruvate by alanine aminotransferase. Glycerol 3-phosphate is converted to dihydroxyacetone phosphate (DHAP) by glycerol-3-phosphate.

**Important Enzymes of Gluconeogenesis**

Most steps in gluconeogenesis represent a reversal of glycolysis and have thus been omitted from the diagram. However, the four important enzymes to know are those required to catalyze reactions that circumvent the irreversible steps of glycolysis in the liver (those catalyzed by glucokinase, phosphofructokinase-1, and pyruvate kinase). Because glycolysis contains three irreversible steps (those catalyzed by hexokinase, phosphofructokinase-1, and pyruvate kinase), different enzymes must exist in gluconeogenesis to allow the body to revert pyruvate to glucose.

Pyruvate carboxylase is a mitochondrial enzyme that is activated by acetyl-CoA (from  $\beta$ -oxidation). The product, oxaloacetate (OAA), is a citric acid cycle intermediate and cannot leave the mitochondrion. Rather, it is reduced to malate, which can leave the mitochondrion via the malate–aspartate shuttle, which is described in Chapter 10 of MCAT Biochemistry Review. Once in the cytoplasm, malate is oxidized to OAA. The fact that acetyl-CoA activates pyruvate carboxylase is an important point. Acetyl-CoA inhibits pyruvate dehydrogenase because a high level of acetyl-CoA implies that the cell is energetically satisfied and need not run the citric acid cycle in the forward direction; in other words, the cell should stop burning glucose. Rather, pyruvate will be shunted through pyruvate carboxylase to help generate

additional glucose through gluconeogenesis. Note that the source of acetyl-CoA is not from glycolysis and pyruvate dehydrogenase in this case, but from fatty acids. Thus, to produce glucose in the liver during gluconeogenesis, fatty acids must be burned to provide this energy, stop the forward flow of the citric acid cycle, and produce massive amounts of OAA that can eventually lead to glucose production for the rest of the body. Phosphoenolpyruvate Carboxykinase (PEPCK) Phosphoenolpyruvate carboxykinase (PEPCK) in the cytoplasm is induced by glucagon and cortisol, which generally act to raise blood sugar levels. It converts OAA to phosphoenolpyruvate (PEP) in a reaction that requires GTP. PEP continues in the pathway to fructose 1,6-bisphosphate. Thus, the combination of pyruvate carboxylase and PEPCK are used to circumvent the action of pyruvate kinase by converting pyruvate back into PEP. Fructose-1,6-bisphosphatase in the cytoplasm is a key control point of gluconeogenesis and represents the rate-limiting step of the process. It reverses the action of phosphofructokinase-1, the rate-limiting step of glycolysis, by removing phosphate from fructose 1,6-bisphosphate to produce fructose 6-phosphate. A common pattern to note is that phosphatases oppose kinases. Fructose-1,6-bisphosphatase is activated by ATP and inhibited by AMP and fructose 2,6-bisphosphate. This should make sense: high levels of ATP imply that a cell is energetically satisfied enough to produce glucose for the rest of the body, whereas high levels of AMP imply that a cell needs energy and cannot afford to produce energy for the rest of the body before satisfying its own requirements. Fructose 2,6- bisphosphate (F2,6-BP) is sometimes thought of as a marker for satisfactory energy levels in liver cells. It helps these cells override the inhibition of phosphofructokinase-1 that occurs when high levels of acetyl-CoA are formed, signaling to the liver cell that it should shift its function from burning to storing fuel. F2,6-BP, produced by PFK-2, controls both gluconeogenesis and glycolysis (in the liver). Recall from the earlier discussion of this enzyme and Figure 9.2 that PFK-2 is activated by insulin and inhibited by glucagon. Thus, glucagon will lower F2,6-BP and stimulate gluconeogenesis, whereas insulin will increase F2,6-BP and inhibit Glucose-6-phosphatase is found only in the lumen of the endoplasmic reticulum in liver cells. Glucose 6-phosphate is

transported into the ER, and free glucose is transported back into the cytoplasm, from where it can diffuse out of the cell using GLUT transporters. The absence of glucose-6-phosphatase in skeletal muscle means that muscle glycogen cannot serve as a source of blood glucose and rather is for use only within the muscle. Glucose-6-phosphatase is used to circumvent glucokinase and hexokinase, which convert glucose to glucose 6-phosphate. Although alanine is the major glucogenic amino acid, almost all amino acids are also glucogenic. Most of these are converted by individual pathways to citric acid cycle intermediates, then to malate, following the same path from there to glucose. Because gluconeogenesis requires acetyl-CoA to occur (to inhibit pyruvate dehydrogenase and stimulate pyruvate carboxylase), gluconeogenesis is inextricably linked to fatty acid oxidation. The source of acetyl-CoA cannot be glycolysis because this would just burn the glucose that is being generated in gluconeogenesis. It is important to note that glucose produced by hepatic (liver-based) gluconeogenesis does not represent an energy source for the liver. Gluconeogenesis requires expenditure of ATP that is provided by  $\beta$ -oxidation of fatty acids. Therefore, as mentioned above, hepatic gluconeogenesis is always dependent on  $\beta$ -oxidation of fatty acids in the liver. During periods of low blood sugar, adipose tissue releases these fatty acids by breaking down triacylglycerols to glycerol (which can also be converted to the gluconeogenic intermediate DHAP) and free fatty acids. Although the acetyl-CoA from fatty acids cannot be converted into glucose, it can be converted into ketone bodies as an alternative fuel for cells, including the brain. Extended periods of low blood sugar are thus usually accompanied by high levels of ketones in the blood. Ketone bodies can be thought of as a transportable form of acetyl-CoA that is primarily utilized in periods of extended starvation. Because red blood cells lack mitochondria, they cannot carry out aerobic metabolism. Rather, pyruvate is converted to lactic acid to regenerate  $\text{NAD}^+$ . However, lactate is acidic; it must be removed from the bloodstream to avoid acidifying the blood. Red blood cells deliver this lactate to the liver, where it can be converted back into pyruvate and, through gluconeogenesis, become glucose for the red blood cells to use. This is known as the Cori cycle: glucose is converted to lactate in

red blood cells, and lactate is converted to glucose in liver cells. MCAT CONCEPT CHECK 9.6 Before you move on, assess your understanding of the material with these questions. 1. Under what physiological conditions should the body carry out gluconeogenesis? 2. What are the four enzymes unique to gluconeogenesis? Which irreversible glycolytic enzymes do they replace? 3. How does acetyl-CoA shift the metabolism of pyruvate? 4. Given that the glycogen storage disorder von Gierke's disease affects the last enzyme of gluconeogenesis, predict the associated metabolic derangement that

### 9.7 The Pentose Phosphate Pathway

After Chapter 9.7, you will be able to:

- Identify the two major products of the pentose phosphate pathway
- Explain the three primary functions of NADPH in cellular respiration

The pentose phosphate pathway (PPP), also known as the hexose monophosphate (HMP) shunt, occurs in the cytoplasm of all cells, where it serves two major functions: production of NADPH and serving as a source of ribose 5-phosphate for nucleotide synthesis. An abbreviated diagram of the pathway is shown in Figure 9.13. The first part of the PPP begins with glucose 6-phosphate, ends with ribulose 5-phosphate, and is irreversible. This part produces NADPH and involves the important rate-limiting enzyme glucose-6-phosphate dehydrogenase (G6PD). G6PD is induced by insulin because the abundance of sugar entering the cell under insulin stimulation will be shunted into both fuel utilization pathways (glycolysis and aerobic respiration), as well as fuel storage pathways (fatty acid synthesis, glycogenesis, and the PPP). The shunt is also inhibited by its product, NADPH, and is activated by one of its

### Figure 9.13 The Pentose Phosphate Pathway

G6PD deficiency is an X-linked disorder and is the most common inherited enzyme defect in the world. Because the PPP is critically important in maintaining levels of glutathione, which helps break down peroxides, these individuals are susceptible to oxidative stress, especially in red blood cells, which carry a large concentration of oxygen. Ingestion of certain oxidizing compounds (especially particular antibiotics and antimalarial medications) or infections can lead to high concentrations of reactive oxygen species, which cause red blood cell lysis. It is hypothesized that the defect evolved because it provides some resistance to malaria infection. G6PD deficiency has also been called favism because fava beans are a highly



oxidizing food that will also cause hemolysis in these individuals. The ribulose 5-phosphate created in the PPP is isomerized to ribose 5-phosphate, the backbone of nucleic acids. When coupled to a nitrogenous base, it forms a nucleotide that can be integrated into RNA. Make sure to review RNA synthesis (transcription; Chapter 7 of MCAT Biochemistry Review), as well as DNA synthesis (Chapter 6 of MCAT Biochemistry Review), because these are highly tested topics on the MCAT. NADPH and NADH are not the same thing.  $\text{NAD}^+$  is an energy carrier; NADPH is used in biosynthesis, in the immune system, and to help prevent oxidative damage. The second part of the pathway, beginning with ribulose 5-phosphate, represents a series of reversible reactions that produce an equilibrated pool of sugars for biosynthesis, including ribose 5-phosphate for nucleotide synthesis. Because fructose 6-phosphate and glyceraldehyde 3-phosphate are among the sugars produced, intermediates can feed back into glycolysis; conversely, pentoses can be made from glycolytic intermediates without going through the G6PD reaction. These interconversions are primarily accomplished by the enzymes transketolase and transaldolase.

**Functions of NADPH** While their names appear similar, NADPH and NADH are not the same thing. In the cell,  $\text{NAD}^+$  acts as a high-energy electron acceptor from a number of biochemical reactions. It thus can be thought of as a potent oxidizing agent because it helps another molecule be oxidized (and thus is reduced itself during the process). The NADH produced from this reduction of  $\text{NAD}^+$  can then feed into the electron transport chain to indirectly. Conversely, NADPH primarily acts as an electron donor in a number of biochemical reactions. It thus can be thought of as a potent reducing agent because it helps other molecules be reduced (and thus is oxidized itself during the process). Cells require NADPH for a variety of functions, Biosynthesis, mainly of fatty acids and cholesterol Assisting in cellular bleach production in certain white blood cells, thereby contributing to bactericidal activity Maintenance of a supply of reduced glutathione to protect against reactive oxygen species (acting as the body's natural antioxidant) This last function is important in protecting cells from free radical oxidative damage caused by peroxides. Hydrogen peroxide,  $\text{H}_2\text{O}_2$ , is produced as a byproduct in aerobic metabolism, and can break

apart to form hydroxide radicals,  $\text{OH}\cdot$ . Free radicals can attack lipids, including those in the phospholipids of the membrane. When oxidized, these lipids lose their function and can weaken the membrane, causing cell lysis. This is especially true in red blood cells, which contain high levels of oxygen, which, when oxidized by other free radicals, becomes the superoxide radical  $\text{O}_2$  radicals can also damage DNA, potentially causing cancer. Glutathione is a reducing agent that can help reverse radical formation before damage is done to the cell.

MCAT CONCEPT CHECK 9.7 Before you move on, assess your understanding of the material with these questions. 1. What are the two major metabolic products of the pentose phosphate pathway 2. What are three primary functions of NADPH? This chapter is critically important in your studying for the MCAT. The processes of carbohydrate metabolism that do not require oxygen are heavily tested, as is their integration. The body has evolved in such a way that we can use, store, or create fuel 24 hours a day, depending on the demands of the internal and external environment. We can turn on pathways when we need them and turn them off when we don't. And the regulation of these pathways makes sense: for example, acetyl-CoA—a downstream product of glycolysis—can turn off the process of glycolysis and allow us to either store extra sugar as other biomolecules or generate sugar anew if we need it. Return to this chapter repeatedly during your studies to maximize points on metabolism on Test Day. In the next chapter, we'll turn our attention to the oxygen-requiring carbohydrate metabolism processes, including the citric acid cycle, the electron transport chain (ETC), and oxidative phosphorylation. You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources! GLUT 2 is found in the liver (for glucose storage) and pancreatic  $\beta$ -islet cells (as part of the glucose sensor). It has a high  $K_m$ . GLUT 4 is found in adipose tissue and muscle and is stimulated by insulin. It has a low  $K_m$ . Glycolysis occurs in the cytoplasm of all cells and does not require oxygen. It yields 2 ATP per molecule of glucose. Important glycolytic enzymes include: Glucokinase, which converts glucose to glucose 6-phosphate. It is present in the pancreatic  $\beta$ -islet cells as part of the glucose sensor and is responsive to insulin in the liver. Hexokinase, which converts glucose to

glucose 6-phosphate in Phosphofructokinase-1 (PFK-1), which phosphorylates fructose 6-phosphate to fructose 1,6-bisphosphate in the rate-limiting step of glycolysis. PFK-1 is activated by AMP and fructose 2,6-bisphosphate (F2,6-BP) and is inhibited by ATP and citrate. Phosphofructokinase-2 (PFK-2), which produces the F2,6-BP that activates PFK-1. It is activated by insulin and inhibited by glucagon. Glyceraldehyde-3-phosphate dehydrogenase produces NADH, which can feed into the electron transport chain. 3-phosphoglycerate kinase and pyruvate kinase each perform substrate-level phosphorylation, placing an inorganic phosphate (Pi) onto ADP to form ATP. The enzymes that catalyze irreversible reactions are glucokinase/hexokinase, PFK-1, and pyruvate kinase. The NADH produced in glycolysis is oxidized by the mitochondrial electron transport chain when oxygen is present. If oxygen or mitochondria are absent, the NADH produced in glycolysis is oxidized by cytoplasmic lactate dehydrogenase. Examples include red blood cells, skeletal muscle (during short, intense bursts of exercise), and any cell deprived of oxygen. Galactose comes from lactose in milk. It is trapped in the cell by galactokinase, and converted to glucose 1-phosphate via galactose-1-phosphate uridylyltransferase and an epimerase. Fructose comes from honey, fruit, and sucrose (common table sugar). It is trapped in the cell by fructokinase, and then cleaved by aldolase B to form glyceraldehyde and DHAP. Pyruvate dehydrogenase refers to a complex of enzymes that convert pyruvate to acetyl-CoA. It is stimulated by insulin and inhibited by acetyl-CoA.

### Glycogenesis and Glycogenolysis

Glycogenesis (glycogen synthesis) is the production of glycogen using two main enzymes: Glycogen synthase, which creates  $\alpha$ -1,4 glycosidic links between glucose molecules. It is activated by insulin in liver and muscle. Branching enzyme, which moves a block of oligoglucose from one chain and adds it to the growing glycogen as a new branch using an  $\alpha$ -1,6 glycosidic link. Glycogenolysis is the breakdown of glycogen using two main Glycogen phosphorylase, which removes single glucose 1-phosphate molecules by breaking  $\alpha$ -1,4 glycosidic links. In the liver, it is activated by glucagon to prevent low blood sugar; in exercising skeletal muscle, it is activated by epinephrine and AMP to provide glucose for the muscle itself. Debranching enzyme, which moves a block of oligoglucose from one

branch and connects it to the chain using an  $\alpha$ -1,4 glycosidic link. It also removes the branchpoint, which is connected via an  $\alpha$ -1,6 glycosidic link, releasing a free glucose molecule. Gluconeogenesis occurs in both the cytoplasm and mitochondria, predominantly in the liver. There is a small contribution from the Most of gluconeogenesis is simply the reverse of glycolysis, using the same enzymes. The three irreversible steps of glycolysis must be bypassed by different enzymes: Pyruvate carboxylase converts pyruvate into oxaloacetate, which is converted to phosphoenolpyruvate by phosphoenolpyruvate carboxykinase (PEPCK). Together, these two enzymes bypass pyruvate kinase. Pyruvate carboxylase is activated by acetyl-CoA from  $\beta$ -oxidation; PEPCK is activated by glucagon and cortisol. Fructose-1,6-bisphosphatase converts fructose 1,6-bisphosphate to fructose 6-phosphate, bypassing phosphofructokinase-1. This is the rate-limiting step of gluconeogenesis. It is activated by ATP directly and glucagon indirectly (via decreased levels of fructose 2,6-bisphosphate). It is inhibited by AMP directly and insulin indirectly (via increased levels of fructose 2,6-bisphosphate). Glucose-6-phosphatase converts glucose 6-phosphate to free glucose, bypassing glucokinase. It is found only in the endoplasmic reticulum of the liver.

**The Pentose Phosphate Pathway** The pentose phosphate pathway (PPP), also known as the hexose monophosphate (HMP) shunt, occurs in the cytoplasm of most cells, generating NADPH and sugars for biosynthesis (derived from The rate-limiting enzyme is glucose-6-phosphate dehydrogenase, which is activated by NADP<sup>+</sup> and insulin and inhibited by NADPH.

**Answers to Concept Checks**

Adipose tissue, muscle High (~15 mM) Low (~5 mM) No—cannot be saturated under normal physiological conditions Yes—saturated when glucose levels are only slightly above 5 No (but serves as glucose sensor to cause release of insulin in pancreatic 2. GLUT 4 is saturated when glucose levels are only slightly above 5 mM, so glucose entry can only be increased by increasing the number of transporters. Insulin promotes the fusion of vesicles containing preformed GLUT 4 with the cell membrane.

1. • Hexokinase phosphorylates glucose to form glucose 6-phosphate, “trapping” glucose in the cell. It is inhibited by glucose 6-phosphate. It is irreversible. Glucokinase also phosphorylates and “traps” glucose in liver

and pancreatic cells, and works with GLUT 2 as part of the glucose sensor in  $\beta$ -islet cells. In liver cells, it is induced by insulin. It is irreversible. PFK-1 catalyzes the rate-limiting step of glycolysis, phosphorylating fructose 6-phosphate to fructose 1,6-bisphosphate using ATP. It is inhibited by ATP, citrate, and glucagon. It is activated by AMP, fructose 2,6-bisphosphate, and insulin. It is irreversible. Glyceraldehyde-3-phosphate dehydrogenase generates NADH while phosphorylating glyceraldehyde 3-phosphate to 1,3- bisphosphoglycerate. It is reversible. 3-Phosphoglycerate kinase performs a substrate-level phosphorylation, transferring a phosphate from 1,3- bisphosphoglycerate to ADP, forming ATP and 3-phosphoglycerate. It is reversible. Pyruvate kinase performs another substrate-level phosphorylation, transferring a phosphate from phosphoenolpyruvate (PEP) to ADP, forming ATP and pyruvate. It is activated by fructose 1,6- bisphosphate. It is irreversible.

2. Fermentation must occur to regenerate  $\text{NAD}^+$ , which is in limited supply in cells. Fermentation generates no ATP or energy carriers; it merely regenerates the coenzymes needed in glycolysis.

3. The binding of 2,3-BPG decreases hemoglobin's affinity for oxygen. Fetal hemoglobin must be able to "steal" oxygen from maternal hemoglobin at the placental interface; therefore, it would be disadvantageous to lower its affinity for oxygen.

1. Galactose is phosphorylated by galactokinase, trapping it in the cell. Galactose- 1-phosphate uridylyltransferase produces glucose 1- phosphate, a glycolytic intermediate, thus linking the pathways.

2. Fructose is phosphorylated by fructokinase, trapping it in the cell (with a small contribution from hexokinase). Aldolase B produces dihydroxyacetone phosphate (DHAP) and glyceraldehyde (which can be phosphorylated to form glyceraldehyde 3-phosphate), which are glycolytic intermediates, thus linking the pathways.

1. Pyruvate,  $\text{NAD}^+$ , and CoA are the reactants of the PDH complex. Acetyl-CoA, NADH, and  $\text{CO}_2$  are the products.

2. Acetyl-CoA inhibits the PDH complex. As a product of the enzyme complex, a buildup of acetyl-CoA from either the citric acid cycle or fatty acid oxidation signals that the cell is energetically satisfied and that the production of acetyl-CoA should be slowed or stopped. Pyruvate can then be used to form other products, such as oxaloacetate for use in 1.

1. Glycogen is made up of a core protein of glycogenin with linear chains of glucose

emanating out from the center, connected by  $\alpha$ -1,4 glycosidic links. Some of these chains are branched, which requires  $\alpha$ -1,6

2. Glycogen synthase attaches the glucose molecule from UDP-glucose to the growing glycogen chain, forming an  $\alpha$ -1,4 link in the process. Branching enzyme creates a branch by breaking an  $\alpha$ -1,4 link in the growing chain and moving a block of oligoglucose to another location in the glycogen granule. The oligoglucose is then attached with an  $\alpha$ -1,6
3. Glycogen phosphorylase removes a glucose molecule from glycogen using a phosphate, breaking the  $\alpha$ -1,4 link and creating glucose 1- phosphate. Debranching enzyme moves all of the glucose from a branch to a longer glycogen chain by breaking an  $\alpha$ -1,4 link and forming a new  $\alpha$ -1,4 link to the longer chain. The branchpoint is left behind; this is removed by breaking the  $\alpha$ -1,6 link to form a free molecule of glucose.

1. Gluconeogenesis occurs when an individual has been fasting for >12 hours. To carry out gluconeogenesis, hepatic (and renal) cells must have enough energy to drive the process of glucose creation, which requires sufficient fat stores to undergo  $\beta$ -oxidation. Phosphoenolpyruvate carboxykinase (PEPCK)

3. Acetyl-CoA inhibits pyruvate dehydrogenase complex while activating pyruvate carboxylase. The net effect is to shift from burning pyruvate in the citric acid cycle to creating new glucose molecules for the rest of the body. The acetyl-CoA for this regulation comes predominantly from  $\beta$ - oxidation, not glycolysis.
4. The last enzyme in gluconeogenesis is glucose-6-phosphatase so patients with von Gierke's disease are unable to perform gluconeogenesis in addition to glycogenolysis. This means patients will be unable to produce glucose during periods of fasting (resulting in hypoglycemia). Furthermore, given a blocker in the gluconeogenic pathway, a buildup of intermediates (including lactate resulting in lactic acidosis) would also be expected.

1. The two major metabolic products of the pentose phosphate pathway are ribose 5-phosphate and NADPH.

2. NADPH is involved in lipid biosynthesis, bactericidal bleach formation in certain white blood cells, and maintenance of glutathione stores to protect against reactive oxygen species.

Science Mastery Assessment

The GLUT 2 receptor, (B), has a high  $K_m$  and is expressed in hepatocytes of the liver. When the concentration of glucose in the blood is high, glucose is transported into the liver with first

order kinetics. Also, in the pancreas, GLUT 2 and glucokinase serve as a glucose sensor. These observations together support (B) as the right answer. The liver, like all cells, needs a constant supply of glucose; however, it is able to produce its own glucose through gluconeogenesis (cells in the kidney can also complete low levels of gluconeogenesis). The other cells listed here are absolutely dependent on a glucose source from the blood for energy, although they may also use other fuels in addition to glucose. For example, the brain can utilize ketone bodies during lengthy periods of starvation; however, it still requires at least some glucose for proper function. GLUT is an abbreviation for glucose transporter and describes a family of sugar transporters with varying distributions and activities. GLUT 4 is found in adipose tissue and muscle, and mediates insulin-stimulated glucose uptake; in fact, it is the only insulin-responsive glucose transporter. Insulin acts via its receptor to translocate GLUT 4 to the plasma membrane. GLUT 4 in skeletal muscle is also stimulated by exercise through an insulin-independent pathway. After an overnight fast, the liver is producing glucose and glucokinase activity would be insignificant. Glucokinase is used to trap extra glucose in liver cells as part of a storage mechanism; with low blood glucose, liver cells would be generating new glucose, not storing it. It is also in the pancreas, where it serves as a glucose sensor; if glucose levels are low, it has little activity in this tissue as well. Malate dehydrogenase, (A), and  $\alpha$ -ketoglutarate dehydrogenase, (C), are citric acid cycle enzymes. Phosphofructokinase-1, (D), is a glycolytic enzyme. Other enzymes used in glycolysis, the citric acid cycle, or gluconeogenesis, such as phosphofructokinase-1, would be expected to maintain normal activity after an overnight fast, using glucose derived from glycogen or gluconeogenesis, rather than orally ingested. This question asks for an enzyme whose role is not to trap sugar in the cell. Phosphofructokinase (C) is the rate-limiting enzyme of glycolysis. Its role is to phosphorylate fructose-6-phosphate to fructose-1,6-bisphosphate during the third step of glycolysis. Importantly, the substrate of phosphofructokinase, i.e. fructose-6-phosphate, has already been once phosphorylated before reaching phosphofructokinase. Therefore, fructose-6-phosphate is already trapped in the cell before even reaching phosphofructokinase. For this reason, it cannot be said that

phosphofructokinase is used to trap sugar in the cell. By contrast, (A), (B), and (D), can be eliminated because hexokinase phosphorylates glucose, galactokinase phosphorylates galactose, and fructokinase phosphorylates fructose, each reaction trapping the previously unphosphorylated sugar in Pyruvate is converted primarily into three main intermediates: acetyl-CoA, (B), for the citric acid cycle (via pyruvate dehydrogenase complex); lactate, (D), during fermentation (via lactate dehydrogenase); or oxaloacetate, (C), for gluconeogenesis (via pyruvate carboxylase). High levels of acetyl-CoA, which is produced during  $\beta$ -oxidation, will inhibit pyruvate dehydrogenase and shift the citric acid cycle to run in the reverse direction, producing oxaloacetate for gluconeogenesis. Acetyl-CoA also stimulates pyruvate The pattern described for this child's glycogen demonstrates appropriate production: there are long chains of glucose monomers, implying that glycogen synthase works. There are also branch points, implying that branching enzyme, (B) works. During glycogenolysis, it seems that the child is able to remove individual glucose monomers and process glycogen down to the branch point itself, which requires glycogen phosphorylase, (A), and  $\alpha$ -1,4: $\alpha$ -1,4 transferase, (C). The metabolic problem here is removing the final glucose at the branch point, which is an  $\alpha$ -1,6 (not  $\alpha$ -1,4) link. This requires (D),  $\alpha$ -1,6 glucosidase. Citrate is produced by citrate synthase from acetyl-CoA and oxaloacetate. This reaction takes place in the mitochondria. When the citric acid cycle slows down, citrate accumulates. In the cytosol, it acts as a negative allosteric regulator of phosphofructokinase-1, the enzyme that catalyzes the rate-limiting step of glycolysis. In most biochemical pathways, only a few enzymatic reactions are under regulatory control. These often occur either at the beginning of pathways or at pathway branch points. The pyruvate dehydrogenase (PDH) complex controls the link between glycolysis and the citric acid cycle, and decarboxylates pyruvate (the end product of glycolysis) with production of NADH and acetyl-CoA (the substrate for the citric acid cycle). After intense exercise, one would expect PDH to be highly active to generate ATP. ADP levels, (A), should be high because ATP was just burned by the muscle. Acetyl-CoA, (B), is an inhibitor of PDH, causing a shift of pyruvate into the gluconeogenic pathway. A high NADH/NAD<sup>+</sup> ratio, (C),



would imply that the cell is already energetically satisfied and not in need of energy, which would not be expected in intensely exercising muscle. In this question, the right answer will be the molecule whose metabolism will be the least impacted by the inhibition of phosphofructokinase-1 (PFK1). The enzyme PFK1 catalyzes the rate-limiting step of glycolysis. So sugars that enter the glycolytic pathway after this rate-limiting step, i.e. downstream of PFK1, would be least impacted by inhibition of PFK1. Given this criterion, recall the metabolic pathway of fructose, choice (B), which is phosphorylated and then cleaved into glyceraldehyde and DHAP, both of which enter glycolysis downstream of PFK1. Therefore the metabolism of fructose does not depend on PFK-1, and would therefore be least impacted by the inhibition of PFK1, making (B) the correct answer. By contrast, glucose, (C), is metabolised using the usual glycolytic pathway, and would therefore be impacted by inhibition of PFK1. Similarly, galactose, (D), is phosphorylated and subsequently isomerized into glucose-6-phosphate, which then follows the usual pathway and would therefore be impacted by inhibition of PFK1. And lactose, (A), is cleaved by lactase into glucose and galactose. For these reasons, (A), (B), and (D) can be Based on the question stem, we can infer that the antibiotics must have been an oxidative stress on the patient (antibiotics, antimalarial medications, infections, certain foods like fava beans, and other common exposures can induce an oxidative stress). The pentose phosphate pathway is responsible for generating NADPH, which is used to reduce glutathione, one of the natural antioxidants present in the body. In individuals with glucose-6-phosphate dehydrogenase (G6PD) deficiency, NADPH cannot be produced at sufficient levels, and oxidative stresses lead to cell membrane and protein (hemoglobin) damage. Note that you do not need to actually know the disease to answer this question; merely knowing that the enzyme must be from the pentose phosphate pathway, which is involved in mitigating oxidative stress, is sufficient. The irreversible enzymes in glycolysis are hexokinase (or glucokinase in liver and pancreatic  $\beta$ -cells), phosphofructokinase-1, and pyruvate kinase. Pyruvate dehydrogenase is not considered a glycolytic enzyme because it requires the mitochondria to function. The list below shows the correct pairing of glycolytic enzymes with

gluconeogenic enzymes: Hexokinase or glucokinase/glucose-6-phosphatase Pyruvate kinase/pyruvate carboxylase and phosphoenolpyruvate After a fast, the liver must contribute glucose into the bloodstream through two main processes: glycogenolysis (early to intermediate fasting) and gluconeogenesis (intermediate to late fasting). The other processes would continue at normal basal levels or have decreased activity after a fast. A deficiency in branching enzyme would result in chains of unbranched glycogen. Since glycogen synthase is not affected, the chain length would be normal, indicating a normal abundance of  $\alpha$ -1,4 linkages. However, a loss of branching would correspond to a decrease in  $\alpha$ -1,6 linkages. Thus, the ratio of  $\alpha$ -1,4 to  $\alpha$ -1,6 would increase as division by a smaller denominator yields a larger value, making (A) the correct answer. Hexokinase catalyzes an important irreversible step of glycolysis, but it is not the rate-limiting step. Phosphofructokinase-1 catalyzes the rate-limiting step of glycolysis. Glycogen synthase, (B), catalyzes the rate-limiting step of glycogenesis; glucose-6-phosphate dehydrogenase, (C), catalyzes the rate-limiting step of the pentose phosphate pathway; and fructose-1,6-bisphosphatase, (D), catalyzes the rate-limiting step of gluconeogenesis. Consult your online resources for additional practice.

Biochemistry Chapter 4 Carbohydrate Structure and Function Biochemistry Chapter 10 Carbohydrate Metabolism II Biochemistry Chapter 12 Bioenergetics and Regulation of Metabolism Biology Chapter 7 The Cardiovascular System General Chemistry Chapter 5 General Chemistry Chapter 11 Carbohydrate Metabolism II: Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these

chapters as appropriate. How to Use This Assessment If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one. If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect. If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

- During a myocardial infarction, the oxygen supply to an area of the heart is dramatically reduced, forcing the cardiac myocytes to switch to anaerobic metabolism. Under these conditions, which of the following enzymes would be activated by increased levels of
  - Succinate dehydrogenase
  - Isocitrate dehydrogenase
  - Pyruvate dehydrogenase
- A patient has been exposed to a toxic compound that increases the permeability of mitochondrial membranes to protons. Which of the following metabolic changes would be expected in this
  - Increased ATP levels
  - Increased oxygen utilization
  - Increased ATP synthase activity
  - Decreased pyruvate dehydrogenase activity
- Which of the following INCORRECTLY pairs a metabolic process with its site of occurrence?
  - Citric acid cycle—outer mitochondrial membrane
  - ATP phosphorylation—cytosol and mitochondria
  - Electron transport chain—inner mitochondrial membrane
- Which of the following processes has the following net reaction?
 
$$2 \text{ acetyl-CoA} + 6 \text{ NAD}^+ + 2 \text{ FAD} + 2 \text{ GDP} + 2 \text{ Pi} + 6 \text{ H}_2\text{O} \rightarrow 4 \text{ CO}_2 + 6 \text{ NADH} + 2 \text{ FADH}_2 + 2 \text{ GTP} + 6 \text{ H}^+ + 2 \text{ CoASH}$$
  - Pyruvate decarboxylation
  - Tricarboxylic acid cycle
  - Electron transport chain
- In glucose degradation under aerobic conditions:
  - oxygen is the final electron acceptor.
  - oxygen is necessary for all ATP synthesis.
  - net water is consumed.
  - the proton-motive force is necessary for all ATP synthesis.
- Fatty acids enter

the catabolic pathway in the form of: B. adipose tissue. D. ketone bodies. 7. All of the following methods are used to produce acetyl-CoA in cells EXCEPT for one. What is the exception? A. Decarboxylation of pyruvate B. Catabolism of ketogenic amino acids C. Reduction of fatty acids D. Metabolism of alcohol 8. In which part of the cell is cytochrome c located? A. Mitochondrial matrix B. Outer mitochondrial membrane C. Inner mitochondrial membrane 9. Which of the following correctly shows the amount of ATP produced from the given high-energy carriers? A. FADH<sub>2</sub> 1 ATP B. FADH<sub>2</sub> 1.5 ATP C. NADH 3 ATP D. NADH 3.5 ATP 10. Why is it preferable to cleave thioester links rather than typical ester links in aerobic metabolism? A. Oxygen must be conserved for the electron transport chain. B. Thioester hydrolysis has a higher energy yield. C. Typical ester hydrolysis cannot occur in vivo. D. Thioester cleavage requires more energy. 11. Which enzyme converts GDP to GTP? A. Nucleosidediphosphate phosphatase B. Nucleosidediphosphate kinase C. Isocitrate dehydrogenase D. Pyruvate dehydrogenase 12. Which of the following best explains why cytosolic NADH can yield potentially less ATP than mitochondrial NADH? A. Cytosolic NADH always loses energy when transferring B. Once NADH enters the matrix from the cytosol, it becomes C. Electron transfer from cytosol to matrix can take more than D. There is an energy cost for bringing cytosolic NADH into the 13. In high doses, aspirin functions as a mitochondrial uncoupler. How would this affect glycogen stores? A. It causes depletion of glycogen stores. B. It has no effect on glycogen stores. C. It promotes additional storage of glucose as glycogen. D. Its effect on glycogen stores varies from cell to cell. 14. Which complex does NOT contribute to the proton-motive force? A. Complex I B. Complex II C. Complex III D. Complex IV 15. Which of the following directly provides the energy needed to form ATP in the mitochondrion? A. Electron transfer in the electron transport chain B. An electrochemical proton gradient C. Oxidation of acetyl-CoA D.  $\beta$ -Oxidation of fatty acids

Carbohydrate Metabolism II: In This Chapter Methods of Forming Acetyl-CoA 10.2 Reactions of the Citric Acid Cycle Net Results and ATP Yield 10.3 The Electron Transport Chain Electron Flow and Complexes The Proton-Motive Force 10.4 Oxidative Phosphorylation The content in this chapter should be relevant to about 6% of all questions

about biochemistry on the MCAT. This chapter covers material from the following AAMC content category: 1D: Principles of bioenergetics and fuel molecule metabolism

Have you ever heard that eating peach pits is deadly? Before you start panicking about the snack you had during your study break, you should know that the accuracy of such a statement is debatable. While it is true that digesting peach pits can result in the formation of trace amounts of cyanide, the concentration is far too low to be clinically worrisome. Cyanide is a poison that binds irreversibly to cytochrome  $a/a_3$ , a protein located in the electron transport chain of the mitochondria. Why can this be deadly? Blocking the electron transport chain (ETC) inhibits aerobic respiration from yielding the ATP the body requires to function properly. Cyanide poisoning leaves cells unable to utilize oxygen for aerobic respiration because it blocks oxygen from binding to the ETC. Therefore, symptoms resemble those of tissue hypoxia: perceived difficulty breathing, general weakness, and, in higher doses, cardiac arrest followed by death within minutes.

But what about the metabolic pathways described in Chapter 9 of MCAT Biochemistry Review—don't they produce energy without oxygen? While glycolysis does not depend on oxygen, it only yields a net 2 ATP per molecule of glucose, which is not nearly enough to maintain the body's energy requirements. This brings us to two of the most tested topics on the MCAT: the citric acid cycle and oxidative phosphorylation. In this chapter, we'll take a close look at what's gained when the products of glycolysis and other derivatives of metabolic pathways enter the citric acid cycle. We'll also look at how this process is regulated with regard to the substrates, products, and reactions involved. Lastly, we'll observe what happens when this cycle's products undergo oxidative phosphorylation, with particular emphasis on how the electron transport chain facilitates the process and the ATP that is yielded.

After Chapter 10.1, you will be able to:

- Detail four potential energy sources for the synthesis of acetyl-CoA
- Identify the major inputs and outputs through the pyruvate dehydrogenase complex

The citric acid cycle, also called the Krebs cycle or the tricarboxylic acid (TCA) cycle, occurs in the mitochondria. The main function of this cycle is the oxidation of acetyl-CoA to  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . In addition, the cycle produces the high-energy electron-carrying molecules NADH and  $\text{FADH}_2$ .

Acetyl- CoA can be obtained from the metabolism of carbohydrates, fatty acids, and amino acids, making it a key molecule in the crossroads of many metabolic pathways and a highly testable compound. Similar to the gluco-/glyco- terminology in Chapter 9 of MCAT Biochemistry Review, it is critical to keep straight the various enzymes containing pyruvate: pyruvate dehydrogenase (PDH), its two regulators (PDH kinase and PDH phosphatase), and pyruvate carboxylase, an enzyme in gluconeogenesis. Methods of Forming Acetyl-CoA Recall from Chapter 9 of MCAT Biochemistry Review that after glucose undergoes glycolysis, its product, pyruvate, enters the mitochondrion via active transport and is oxidized and decarboxylated. These reactions are catalyzed by a multienzyme complex called the pyruvate dehydrogenase complex, which is located in the mitochondrial matrix. As we take a deeper look at the enzymes that make up this complex, as well as the substrates and products of their reactions, it is helpful to follow the carbons in the molecules. For example, the three-carbon pyruvate is cleaved into a two- carbon acetyl group and carbon dioxide. This reaction is irreversible, which explains why glucose cannot be formed directly from acetyl-CoA. In mammals, pyruvate dehydrogenase complex is made up of five enzymes: pyruvate dehydrogenase (PDH), dihydrolipoyl transacetylase, dihydrolipoyl dehydrogenase, pyruvate dehydrogenase kinase, and pyruvate dehydrogenase phosphatase. While the first three work in concert to convert pyruvate to acetyl-CoA, the latter two regulate the actions of PDH. Figure 10.1 shows the overall reaction for the conversion of pyruvate to acetyl-CoA. The reaction is exergonic ( $\Delta G' = -33.4 \text{ kJ mol}^{-1}$ ). The complex is inhibited by an accumulation of acetyl-CoA and NADH that can occur if the electron transport chain is not properly functioning or is inhibited.

Figure 10.1 Overall Reaction of Pyruvate Dehydrogenase Complex Note that coenzyme A (CoA) is written as CoASH in the reaction above. This is because CoA is a thiol, containing an SH group. When acetyl-CoA forms, it does so via covalent attachment of the acetyl group to the SH group, resulting in the formation of a thioester, which contains sulfur instead of the typical oxygen ester -OR. The formation of a thioester rather than a typical ester is worth noting because of the high-energy properties of thioesters. That is to say, when a thioester

undergoes a reaction such as hydrolysis, a significant amount of energy will be released. This can be enough to drive other reactions forward, like the citric acid cycle. The pyruvate dehydrogenase complex enzymes needed to catalyze acetyl-CoA formation are listed below in sequential order, and the mechanism is shown in Figure 10.2.

**Figure 10.2 Mechanism of Pyruvate Dehydrogenase**

In studies of pathologies that affect the central cholinergic system such as Alzheimer's disease, Huntington's disease, and even alcoholism, a decrease in glucose metabolism and oxidative phosphorylation has been observed in the brain. Ongoing research will hopefully determine if the resulting lack of acetyl-CoA could be a cause of the disease or a result of the disease. With decreased amounts of acetyl-CoA, not only is energy production a concern, but also the production of the neurotransmitter acetylcholine.

**Pyruvate dehydrogenase (PDH):** Pyruvate is oxidized, yielding  $\text{CO}_2$ , while the remaining two-carbon molecule binds covalently to thiamine pyrophosphate (vitamin B1, TPP). TPP is a coenzyme held by noncovalent interactions to PDH.  $\text{Mg}^{2+}$  is also required.

**Dihydrolipoyl transacetylase:** The two-carbon molecule bonded to TPP is oxidized and transferred to lipoic acid, a coenzyme that is covalently bonded to the enzyme. Lipoic acid's disulfide group acts as an oxidizing agent, creating the acetyl group. The acetyl group is now bonded to lipoic acid via thioester linkage. After this, dihydrolipoyl transacetylase catalyzes the CoASH interaction with the newly formed thioester link, causing transfer of an acetyl group to form acetyl-CoA. Lipoic acid is left in its reduced form.

**Dihydrolipoyl dehydrogenase:** Flavin adenine dinucleotide (FAD) is used as a coenzyme in order to reoxidize lipoic acid, allowing lipoic acid to facilitate acetyl-CoA formation in future reactions. As lipoic acid is reoxidized, FAD is reduced to  $\text{FADH}_2$ . In subsequent reactions, this  $\text{FADH}_2$  is reoxidized to FAD, while  $\text{NAD}^+$  is reduced to NADH. Once formed, mitochondrial acyl-CoA can undergo  $\beta$ -oxidation. This process is discussed in Chapter 11 of MCAT Biochemistry Review. While glycolysis is a heavily reviewed and heavily tested contributor to the production of acetyl-CoA, other pathways are capable of forming acetyl-CoA. These pathways act on fatty acids, ketogenic amino acids, ketone bodies, and alcohol. Descriptions of these pathways are provided below. The ultimate production of acetyl-CoA

allows all of these pathways to culminate in the final common pathway of the citric acid cycle.

**Fatty acid oxidation ( $\beta$ -oxidation):** In the cytosol, a process called activation causes a thioester bond to form between carboxyl groups of fatty acids and CoASH. Because this activated fatty acyl-CoA cannot cross the inner mitochondrial membrane, the fatty acyl group is transferred to carnitine via a transesterification reaction, as shown in Figure 10.3. Carnitine is a molecule that can cross the inner membrane with a fatty acyl group in tow. Once acyl-carnitine crosses the inner membrane; it transfers the fatty acyl group to a mitochondrial CoASH via another transesterification reaction. In other words, carnitine's function is merely to carry the acyl group from a cytosolic CoASH to a mitochondrial CoASH. Once acyl-CoA is formed in the matrix,  $\beta$ -oxidation can occur, which removes two-carbon fragments from the Figure 10.3

**Fatty Acid Activation and Transport**

**Amino acid catabolism:** Certain amino acids can be used to form acetyl-CoA. These amino acids must lose their amino group via transamination; their carbon skeletons can then form ketone bodies. These amino acids are termed ketogenic for that reason. The conversion of ketone bodies to acetyl-CoA is mentioned below.

**Ketones:** Although acetyl-CoA is typically used to produce ketones when the pyruvate dehydrogenase complex is inhibited, the reverse reaction can occur as well.

**Alcohol:** When alcohol is consumed in moderate amounts, the enzymes alcohol dehydrogenase and acetaldehyde dehydrogenase convert it to acetyl-CoA. However, this reaction is accompanied by NADH buildup, which inhibits the Krebs cycle. Therefore, the acetyl-CoA formed through this process is used primarily to synthesize fatty acids. While the brain normally uses glucose for energy, under conditions such as starvation, ketone bodies can become the brain's major source of energy.

**MCAT CONCEPT CHECK 10.1** Before you move on, assess your understanding of the material with these questions.

1. What is the overall reaction of the pyruvate dehydrogenase complex?
2. What other molecules can be used to make acetyl-CoA, and how does the body perform this conversion for each?

**Mechanism of Conversion to Acetyl-CoA**

**10.2 Reactions of the Citric Acid Cycle**

**After Chapter 10.2, you will be able to:**

- Explain the purpose of the citric acid cycle, including major inputs/outputs
- Identify the importance of key enzymes within the



citric acid cycle Recall the inhibitors and activators of the enzymes citrate synthase, isocitrate dehydrogenase, and alpha-ketoglutarate dehydrogenase complex The citric acid cycle takes place in the mitochondrial matrix and begins with the coupling of a molecule of acetyl-CoA to a molecule of oxaloacetate. While parts of this molecule are oxidized to carbon dioxide and both energy (GTP) and energy carriers (NADH and FADH<sub>2</sub>) are produced, the other substrates and products of the cycle are reused over and over again. Although oxygen is not directly required in the cycle, the pathway will not occur anaerobically. This is because NADH and FADH<sub>2</sub> will accumulate if oxygen is not available for the electron transport chain and will inhibit the cycle. As we look at the individual reactions that take place during the citric acid cycle, it cannot be overemphasized that this process is exactly what it's called: a cycle, not just a series of reactions. An overview of the cycle is provided in Figure 10.4, and we'll take a deeper look at those steps below.

Figure 10.4 The Citric Acid Cycle Step 1—Citrate Formation: First, acetyl-CoA and oxaloacetate undergo a condensation reaction to form citryl-CoA, an intermediate. Then, the hydrolysis of citryl-CoA yields citrate and CoASH. This reaction is catalyzed by citrate synthase. As discussed in Chapter 2 of MCAT Biochemistry Review, synthases are enzymes that form new covalent bonds without needing significant energy. This second part of this step energetically favors the formation of citrate and helps the cycle revolve in the forward direction. This reaction can be seen in Figure 10.5.

Figure 10.5 Citrate Formation Step 2—Citrate Isomerized to Isocitrate: Achiral citrate is isomerized to one of four possible isomers of isocitrate. First, citrate binds at three points to the enzyme aconitase. Then water is lost from citrate, yielding cis- aconitate. Finally, water is added back to form isocitrate. The enzyme is a metalloprotein that requires Fe<sup>2+</sup>. In Figure 10.6, you can see that this results in a switching of a hydrogen and a hydroxyl group. Overall, this step is necessary to facilitate the subsequent oxidative decarboxylation.

Figure 10.6 Citrate Isomerized to Isocitrate Step 3— $\alpha$ -Ketoglutarate and CO<sub>2</sub> Formation: Isocitrate is first oxidized to oxalosuccinate by isocitrate dehydrogenase. Then oxalosuccinate is decarboxylated to produce  $\alpha$ -ketoglutarate and CO<sub>2</sub>, as shown in Figure 10.7. This is a very important step to know for Test Day because

isocitrate dehydrogenase is the rate-limiting enzyme of the citric acid cycle. The first of the two carbons from the cycle is lost here. This is also the first NADH produced from intermediates in the cycle. Figure 10.7  $\alpha$ -Ketoglutarate and CO<sub>2</sub> Formation Dehydrogenases are a subtype of oxidoreductases (enzymes that catalyze an oxidation– reduction reaction). Dehydrogenases transfer a hydride ion (H<sup>-</sup>) to an electron acceptor, usually NAD<sup>+</sup> or FAD. Therefore, whenever you see dehydrogenase in aerobic metabolism, be on the lookout for a high-energy electron carrier being formed! Step 4—Succinyl-CoA and CO<sub>2</sub> Formation: These reactions are carried out by the  $\alpha$ -ketoglutarate dehydrogenase complex, which is similar in mechanism, cofactors, and coenzymes to the pyruvate dehydrogenase (PDH) complex. In the formation of succinyl-CoA,  $\alpha$ -ketoglutarate and CoA come together and produce a molecule of carbon dioxide, as shown in Figure 10.8. This carbon dioxide represents the second and last carbon lost from the cycle. Reducing NAD<sup>+</sup> produces another NADH. Figure 10.8 Succinyl-CoA and CO<sub>2</sub> Formation Citrate synthase doesn't require energy input in order to form covalent bonds, but succinyl- CoA synthetase certainly does. Pay careful attention to enzyme names: little things can add up to careless mistakes on Test Day otherwise! Step 5—Succinate Formation: Hydrolysis of the thioester bond on succinyl-CoA yields succinate and CoASH, and is coupled to the phosphorylation of GDP to GTP. This reaction is catalyzed by succinyl-CoA synthetase, as shown in Figure 10.9. Synthetases, unlike synthases, create new covalent bonds with energy input. Recall the earlier discussion about thioester bonds with regard to acetyl-CoA: they're unique in that their hydrolysis is accompanied by a significant release of energy. Therefore, phosphorylation of GDP to GTP is driven by the energy released by thioester hydrolysis. Once GTP is formed, an enzyme called nucleosidediphosphate kinase catalyzes phosphate transfer from GTP to ADP, thus producing ATP. Note that this is the only time in the entire citric acid cycle that ATP is produced directly; ATP production occurs predominantly within the electron transport chain. Figure 10.9 Succinate Formation Step 6—Fumarate Formation: This is the only step of the citric acid cycle that doesn't take place in the mitochondrial matrix; instead, it occurs on the inner membrane. Let's look at why: succinate undergoes oxidation to yield

fumarate. This reaction is catalyzed by succinate dehydrogenase. Succinate dehydrogenase is considered a flavoprotein because it is covalently bonded to FAD, the electron acceptor in this reaction. This enzyme is an integral protein on the inner mitochondrial membrane. As succinate is oxidized to fumarate, FAD is reduced to FADH<sub>2</sub>. Each molecule of FADH<sub>2</sub> then passes the electrons it carries to the electron transport chain, which eventually leads to the production of 1.5 ATP (unlike NADH, which will give rise to 2.5 ATP). FAD is the electron acceptor in this reaction because the reducing power of succinate is not great enough to reduce NAD<sup>+</sup>.

**Substrates of Citric Acid Cycle: Please, Can I Keep Selling Seashells For Money, Officer?**

**Step 7—Malate Formation:** The enzyme fumarase catalyzes the hydrolysis of the alkene bond in fumarate, thereby giving rise to malate. Although two enantiomeric forms are possible, only L-malate forms in this reaction.

**Step 8—Oxaloacetate Formed Anew:** The enzyme malate dehydrogenase catalyzes the oxidation of malate to oxaloacetate. A third and final molecule of NAD<sup>+</sup> is reduced to NADH. The newly formed oxaloacetate is ready to take part in another turn of the citric acid cycle, and we've gained all of the high-energy electron carriers possible from one turn of the cycle. The last steps of the citric acid cycle—from succinate to oxaloacetate—are shown in Figure 10.10

**The Final Steps of the Citric Acid Cycle**

**Net Results and ATP Yield** Now let's take a step back and see what our net yield is from the steps we just took. Starting with the pyruvate dehydrogenase complex, recall that the products of this reaction include one acetyl-CoA and one NADH. In the citric acid cycle, steps 3, 4, and 8 each produce one NADH, while step 6 forms one FADH<sub>2</sub>. Step 5 yields one GTP, which can be converted to ATP. Two carbons leave the cycle in the form of CO<sub>2</sub>. Each NADH can be converted to approximately 2.5 ATP, while each FADH<sub>2</sub> molecule can yield about 1.5 ATP. The total amount of chemical energy harvested per pyruvate is listed below.

**Pyruvate Dehydrogenase Complex:** Pyruvate + CoASH + NAD<sup>+</sup> → acetyl-CoA + NADH + CO<sub>2</sub> + H<sup>+</sup>

**Citric Acid Cycle:** Acetyl-CoA + 3 NAD<sup>+</sup> + FAD + GDP + Pi + 2 H<sub>2</sub>O → 2 CO<sub>2</sub> + CoASH + 3 NADH + 3 H<sup>+</sup> + FADH<sub>2</sub> + GTP

4 NADH 10 ATP (2.5 ATP per NADH) 1 FADH<sub>2</sub> 1.5 ATP (1.5 ATP per FADH<sub>2</sub>) 1 GTP 1 ATP

**Total:** 12.5 ATP per pyruvate = 25 ATP per glucose

Glycolysis yields two ATP and

two NADH, providing another seven molecules of ATP; thus, the net yield of ATP for one glucose molecule from glycolysis through oxidative phosphorylation is 30–32 ATP. Note that the efficiency of glycolysis varies slightly from cell to cell, so there is a range of ATP yield from one molecule of glucose. Let's say it's Test Day, and you see the following question: Which of the following is an inhibitor of isocitrate dehydrogenase? Before you start to panic, take a step back and use critical thinking. Where have we heard of isocitrate dehydrogenase—or merely isocitrate—before? The Krebs cycle. By knowing this, you can already make a fair attempt at such a question. Because energy (ATP) and energy carriers (NADH and FADH<sub>2</sub>) are products of this process, it makes sense that these molecules would have a negative feedback effect on the citric acid cycle. Always consider the big picture when faced with questions like these. For now, we'll outline how regulation occurs throughout the citric acid cycle; look for the recurring theme that energy products inhibit energy production processes.

### Pyruvate Dehydrogenase Complex Regulation

Even upstream from its actual starting point, the citric acid cycle can be regulated. The mechanism by which this happens is phosphorylation of PDH, which is facilitated by the enzyme pyruvate dehydrogenase kinase. Thus, whenever levels of ATP rise, phosphorylating PDH inhibits acetyl-CoA production. Conversely, the pyruvate dehydrogenase complex is reactivated by the enzyme pyruvate dehydrogenase phosphatase in response to high levels of ADP. By removing a phosphate from PDH, pyruvate dehydrogenase phosphatase is able to reactivate acetyl-CoA production. Acetyl-CoA also has a negative feedback effect on its own production. When using alternative fuel sources such as fats, the acetyl-CoA production is sufficient to make it redundant to continue producing acetyl-CoA from carbohydrate metabolism—that's part of why eating a high-fat meal fills you up so quickly! ATP and NADH, as markers of the cell being satisfied energetically, also inhibit PDH.

### Control Points of the Citric Acid Cycle

There are three essential checkpoints that regulate the citric acid cycle from within, and allosteric activators and inhibitors regulate all of them. The details of these mechanisms are outlined below and in Figure 10.11.

### Figure 10.11

#### Checkpoints and Regulation of the Citric Acid Cycle

**Citrate synthase:** ATP and NADH function

as allosteric inhibitors of citrate synthase, which makes sense because both are products (indirect and direct, respectively) of the enzyme. Citrate also allosterically inhibits citrate synthase directly, as does succinyl-CoA. Isocitrate dehydrogenase: As we discussed in the beginning of this section, this enzyme that catalyzes the citric acid cycle is likely to be inhibited by energy products: ATP and NADH. Conversely, ADP and NAD<sup>+</sup> function as allosteric activators for the enzyme and enhance its affinity for substrates.  $\alpha$ -Ketoglutarate dehydrogenase complex: Once again, the reaction products of succinyl-CoA and NADH function as inhibitors of this enzyme complex. ATP is also inhibitory and slows the rate of the cycle when the cell has high levels of ATP. The complex is stimulated by ADP and calcium ions. Note that high levels of ATP and NADH inhibit the citric acid cycle, while high levels of ADP and NAD<sup>+</sup> promote it. This isn't a coincidence! When energy is being consumed in large amounts, more and more ATP is converted to ADP and NADH is converted to NAD<sup>+</sup>. It is therefore the ATP/ADP ratio and NADH/NAD<sup>+</sup> ratio that help determine whether the citric acid cycle will be inhibited or activated. During a metabolically active state, ADP and NAD<sup>+</sup> levels should rise as ATP and NADH levels decline, thus inducing activation at all the various checkpoints described above, replacing the energy used up by active tissues.

**MCAT CONCEPT CHECK 10.2** Before you move on, assess your understanding of the material with these questions.

1. What is the purpose of all the reactions that collectively make up the citric acid cycle?
2. What enzyme catalyzes the rate-limiting step of the citric acid cycle?
3. What are the three main sites of regulation within the citric acid cycle? What molecules inhibit and activate the three main checkpoints?

**10.3 The Electron Transport Chain** After Chapter 10.3, you will be able to:

- Connect the reactions of the electron transport chain to the generation of ATP
- Distinguish between the two shuttle mechanisms for NADH transport into the mitochondrion
- Recall the inputs, outputs, and major components of the four complexes of the electron transport chain

The electron transport chain is the final common pathway that utilizes the harvested electrons from different fuels in the body. It is important to make the distinction that it is not the flow of electrons but the proton gradient it generates that ultimately produces ATP. Aerobic metabolism is the most

efficient way of generating energy in living systems, and the mitochondrion is the reason why. In eukaryotes, the aerobic components of respiration are executed in mitochondria, while anaerobic processes such as glycolysis and fermentation occur in the cytosol. Looking at Figure 10.12, notice how the components of the mitochondria are critical in the harvesting of energy. The citric acid cycle takes place in the mitochondrial matrix. The assemblies needed to complete oxidative phosphorylation are housed adjacent to the matrix in the inner membrane of the mitochondria. The inner mitochondrial membrane is assembled into folds called cristae, which maximize surface area. It is the inner mitochondrial membrane that will be essential for generating ATP using the proton-motive force, an electrochemical proton gradient generated by the complexes of the electron transport chain.

**Figure 10.12 Mitochondrial Structure**

The final step in aerobic respiration is actually two steps: electron transport along the inner mitochondrial membrane and the generation of ATP via ADP phosphorylation. While these two processes are actually separate entities, they are very much coupled, so explaining these steps together makes a great deal of sense. The electron-rich molecules NADH and FADH<sub>2</sub> are formed as byproducts at earlier steps in respiration. They transfer their electrons to carrier proteins located along the inner mitochondrial membrane. Finally, these electrons are given to oxygen in the form of hydride ions (H<sup>-</sup>) and water is formed. While this is happening, energy released from transporting electrons facilitates proton transport at three specific locations in the chain. Protons are moved from the mitochondrial matrix into the intermembrane space of the mitochondria, thereby creating a greater concentration gradient of hydrogen ions that can be used to drive ATP synthesis.

**Electron Flow and Complexes**

The formation of ATP is endergonic and electron transport is an exergonic pathway. By coupling these reactions, the energy yielded by one reaction can fuel the other. In order for energy to be harnessed via electron transport reactions, the proteins along the inner membrane must transfer the electrons donated by NADH and FADH<sub>2</sub> in a specific order and direction. The physical property that determines the direction of electron flow is reduction potential. Recall from Chapter 12 of MCAT General Chemistry Review that if you pair two molecules with different reduction potentials, the

molecule with the higher potential will be reduced, while the other molecule will become oxidized. The electron transport chain is therefore nothing more than a series of oxidations and reductions that occur via the same mechanism. NADH is a good electron donor, and the high reduction potential of oxygen makes it a great final acceptor in the electron transport chain. The organizational structure of the membrane-bound complexes that make up the transport chain is diagrammed in Figure 10.13 and further Figure 10.13 Respiratory Complexes on the Inner Mitochondrial Membrane Steps 1 and 2 of complex III are drawn as two separate steps here for clarity; however, the same CoQH<sub>2</sub>-cytochrome c oxidoreductase complex is used for Complex I (NADH-CoQ oxidoreductase): The transfer of electrons from NADH to coenzyme Q (CoQ) is catalyzed in this first complex. This complex has over 20 subunits, but the two highlighted here include a protein that has an iron-sulfur cluster and a flavoprotein that oxidizes NADH. The flavoprotein has a coenzyme called flavin mononucleotide (FMN) covalently bonded to it. FMN is quite similar in structure to FAD, flavin adenine dinucleotide. The first step in the reaction involves NADH transferring its electrons over to FMN, thereby becoming oxidized to NAD<sup>+</sup> as FMN is reduced to FMNH<sub>2</sub>. Next, the flavoprotein becomes reoxidized while the iron-sulfur subunit is reduced. Finally, the reduced iron-sulfur subunit donates the electrons it received from FMNH<sub>2</sub> to coenzyme Q (also called ubiquinone). Coenzyme Q becomes CoQH<sub>2</sub>. This first complex is one of three sites where proton pumping occurs, as four protons are moved to the intermembrane space.

$$\text{NADH} + \text{H}^+ + \text{FMN} \rightarrow \text{NAD}^+ + \text{FMNH}_2$$

$$\text{FMNH}_2 + 2 \text{FeS}_{\text{oxidized}} \rightarrow \text{FMN} + 2 \text{FeS}_{\text{reduced}} + 2 \text{H}^+$$

$$2 \text{FeS}_{\text{reduced}} + \text{CoQ} + 2 \text{H}^+ \rightarrow 2 \text{FeS}_{\text{oxidized}} + \text{CoQH}_2$$

The net effect is passing high-energy electrons from NADH to CoQ to NADH + H<sup>+</sup> + CoQ → NAD<sup>+</sup> + CoQH<sub>2</sub>

**Complex II (Succinate-CoQ oxidoreductase):** Just like Complex I, Complex II transfers electrons to coenzyme Q. While Complex I received electrons from NADH, Complex II actually receives electrons from succinate. Remember that succinate is a citric acid cycle intermediate, and that it is oxidized to fumarate upon interacting with FAD. FAD is covalently bonded to Complex II, and once succinate is oxidized, it's converted to FADH<sub>2</sub>. After this, FADH<sub>2</sub> gets reoxidized to FAD as it

reduces an iron-sulfur protein. The final step reoxidizes the iron-sulfur protein as coenzyme Q is reduced. Because succinate dehydrogenase was responsible for oxidizing succinate to fumarate in the citric acid cycle, it makes sense that succinate dehydrogenase is also a part of Complex II. It should be noted that no hydrogen pumping occurs here to contribute to the proton gradient.

$$\text{succinate} + \text{FAD} \rightarrow \text{fumarate} + \text{FADH}_2$$

$$\text{FADH}_2 + \text{Fe}^{\text{Soxidized}} \rightarrow \text{FAD} + \text{Fe}^{\text{Sreduced}}$$

$$\text{Fe}^{\text{Sreduced}} + \text{CoQ} + 2 \text{H}^+ \rightarrow \text{Fe}^{\text{Soxidized}} + \text{CoQH}_2$$

The net effect is passing high-energy electrons from succinate to CoQ to succinate + CoQ + 2 H<sup>+</sup> → fumarate + CoQH<sub>2</sub>

Unlike iron in cytochromes, iron in the heme group of hemoglobin always remains as Fe<sup>2+</sup> during the transport of oxygen through the bloodstream under normal conditions. Ubiquinone can be created from its corresponding phenol by oxidation and represents an example of a quinone (2,5-cyclohexadiene-1,4-diones). These fascinating compounds are explored in Chapter 5 of MCAT Organic Chemistry Review.

**Complex III (CoQH<sub>2</sub>-cytochrome c oxidoreductase):** Also called cytochrome reductase, this complex facilitates the transfer of electrons from coenzyme Q to cytochrome c in a few steps. Though Complex III is drawn as two separate complexes in Figure 10.13 to illustrate the sequential reactions that occur within the complex, both of these steps are occurring within the same complex, using the same coenzyme Q. The overall reaction is written below. The following steps involve the oxidation and reduction of cytochromes: proteins with heme groups in which iron is reduced to Fe<sup>2+</sup> and reoxidized to Fe<sup>3+</sup>.

$$\text{CoQH}_2 + 2 \text{cytochrome c [with Fe}^{3+}] \rightarrow \text{CoQ} + 2 \text{cytochrome c [with Fe}^{2+}] + 2 \text{H}^+$$

In the transfer of electrons from iron, only one electron is transferred per reaction, but because coenzyme Q has two electrons to transfer, two cytochrome c molecules will be needed. Complex III's main contribution to the proton-motive force is via the Q cycle. In the Q cycle, two electrons are shuttled from a molecule of ubiquinol (CoQH<sub>2</sub>) near the intermembrane space to a molecule of ubiquinone (CoQ) near the mitochondrial matrix. Another two electrons are attached to heme moieties, reducing two molecules of cytochrome c. A carrier containing iron and sulfur assists this process. In shuttling these electrons, four protons are also displaced to the intermembrane space; therefore, the Q cycle continues to



increase the gradient of the proton-motive force across the inner mitochondrial membrane. Both coenzyme Q and cytochrome c aren't technically part of the complexes we're describing. However, because both are able to move freely in the inner mitochondrial membrane, this degree of mobility allows these carriers to transfer electrons by physically interacting with the next component of the transport chain. Cyanide, mentioned in the introduction to this chapter, is an inhibitor of cytochrome subunits a and a<sub>3</sub>. The cyanide anion is able to attach to the iron group and prevent the transfer of electrons. Tissues that rely heavily on aerobic respiration such as the heart and the central nervous system can be greatly impacted.

**Complex IV (cytochrome c oxidase):** This complex facilitates the culminating step of the electron transport chain: transfer of electrons from cytochrome c to oxygen, the final electron acceptor. This complex includes subunits of cytochrome a, cytochrome a<sub>3</sub>, and Cu<sup>2+</sup> ions. Together, cytochromes a and a<sub>3</sub> make up cytochrome oxidase. Through a series of redox reactions, cytochrome oxidase gets oxidized as oxygen, becomes reduced, and forms water. This is the final location on the transport chain where proton pumping occurs, as two protons are moved across the membrane. The role proton pumping plays in ATP synthesis is an essential one that we will describe in detail next. The overall reaction is: 4 cytochrome c [with Fe<sup>2+</sup>] + 4 H<sup>+</sup> + O<sub>2</sub> → 4 cytochrome c [with Fe<sup>3+</sup>] + 2 H<sub>2</sub>O

**BIOCHEMISTRY GUIDED EXAMPLE WITH EXPERT** Mitochondrial disorders are genetically and clinically heterogeneous, mainly affecting energy-demanding organs due to impaired oxidative phosphorylation. Complex I deficiency (NADH:ubiquinone oxidoreductase) in the electron transport chain is the most prevalent oxidative phosphorylation disorder; treatment options are currently limited and successes are often anecdotal. There have been reports of increased muscle endurance by diet modification, and, following these reports, this study seeks to examine dietary treatment options for Complex I deficiency. Focus on the big idea: there is a Complex I of the ETC and goal of study: see if diet helps with A Dutch female patient with known Complex I deficiency was subjected to HPLC-based metabolite profiling on blood plasma and urine to reveal metabolic abnormalities. The patient's muscle endurance was examined by performing a

bicycle test, with dietary intake for this assessment based on the patient's usual diet, in which 34.5% of the energy was derived from fat. A dietary intervention study was then performed where the patient was instructed to consume a high-carbohydrate diet for 3 weeks with 25% of the energy derived from fat, and subsequently a high-fat diet for 3 weeks with 55% of the energy derived from fat. The same bicycle endurance test was performed after each diet. Differences in muscle endurance during the bicycle test were examined with direct substrate infusion, comparing intra-lipid infusion to glucose infusion. In each of the conditions, the mean oxygen consumption ( $\text{VO}_2$  mean) was also measured during the bicycle test. The results are plotted

Assessing how long the patient biked as a measure of muscle diet, high-carb diet, high fat diet, glucose infused, fat infused during the bike test

IVs: five diet DVs: time spent biking and how much

Trend: longest bike high-fat diet, lowest with glucose infusion

Adapted from Theunissen, T., Gerards, M., Hellebrekers, D., van Tienen, F. H., Kamps, R., Sallevelt, S., ... Smeets, H. (2017). Selection and characterization of palmitic acid responsive patients with an OXPHOS Complex I defect. *Frontiers in Molecular Neuroscience*, 10, 336.

According to the data, what is the best treatment option for the patient's Complex I deficiency and why? The question stem starts with "according to the data", so we need to ensure that we have a firm understanding of the passage presenting the context for that data. The experimental context introduced in paragraph 1 is a malfunction of Complex I in the ETC, and the hypothesis centers on dietary treatment that can help increase muscle endurance. We can recall from our content background that the ETC functions to transfer electrons from NADH and  $\text{FADH}_2$  to electron acceptors, thereby creating a proton gradient to fuel the production of ATP. The coupling of the ETC to ATP synthase is termed oxidative phosphorylation and requires the availability of oxygen, as oxygen is the final electron acceptor in the ETC. Since ATP is required for muscle contraction, and oxygen is an essential component of the ETC, both high endurance and high oxygen consumption would indicate a high level of aerobic respiration. The question asks us about the mechanism behind the best treatment option, so we must now analyze the data to see which treatment was best. According to the graph, the high-fat

diet allowed the patient to endure the bicycle test the longest, and have the highest level of oxygen consumption. Therefore, the best treatment option is a diet with a high proportion of fat. This conclusion is supported by the fact that lipid infusion also gave higher values compared to glucose infusion, though not as much as the high-fat diet. The next aspect of the question to address is to examine the “why?”—why does ingesting high-fat work this way? Again, using prior knowledge, recall that metabolism of fats generates acetyl-CoA, and acetyl-CoA can then enter the citric acid cycle to produce NADH and FADH<sub>2</sub>. Complex I receives electrons from NADH, and Complex II receives electrons from FADH<sub>2</sub>, so in this patient with a Complex I disorder, only the production of FADH<sub>2</sub> is fueling aerobic respiration. So, why is there such a large difference between the high-fat and high-carbohydrate diets, especially considering the fact that metabolism of glucose will also eventually generate acetyl-CoA? Glycolysis (break down of glucose into pyruvate) only generates NADH, so the ratio of FADH<sub>2</sub>/NADH is higher in fat metabolism vs. carbohydrate metabolism, leading to more efficient generation of energy by funneling more electron carriers to Complex In summary, the best treatment for the patient’s Complex I deficiency is the high-fat diet, due to increased funneling of electron carriers to The Proton-Motive Force Let’s take a step back and look at the proton gradient that formed as electrons were passed along the ETC. As [H<sup>+</sup>] increases in the intermembrane space, two things happen simultaneously: pH drops in the intermembrane space, and the voltage difference between the intermembrane space and matrix increases due to proton pumping. Together, these two changes contribute to what is referred to as an electrochemical gradient: a gradient that has both chemical and electrostatic properties. Because it is based on protons, we often refer to the electrochemical gradient across the inner mitochondrial membrane as the proton-motive force. Any electrochemical gradient stores energy, and it will be the responsibility of ATP synthase to harness this energy to form ATP from ADP and an inorganic phosphate. As we look at the net ATP yield per glucose, note that a range exists between 30 and 32. This is because efficiency of aerobic respiration varies between cells. This variable efficiency is caused by the fact that cytosolic

NADH formed through glycolysis cannot directly cross into the mitochondrial matrix. Because it cannot contribute its electrons to the transport chain directly, it must find alternate means of transportation referred to as shuttle mechanisms. A shuttle mechanism transfers the high-energy electrons of NADH to a carrier that can cross the inner mitochondrial membrane. Depending on which of the two shuttle mechanisms NADH participates in, either 1.5 or 2.5 ATP will end up being produced. Let's take a look at the two.

**Glycerol 3-phosphate shuttle:** Glycerol 3-phosphate is an important link between lipid metabolism, discussed in Chapter 11 of MCAT Biochemistry Review, and glycolysis, discussed in Chapter 9. Its ability to be converted to DHAP, an intermediate of glycolysis, means that the glycerol of triacylglycerols can be shunted into glycolysis for energy. The cytosol contains one isoform of glycerol-3-phosphate dehydrogenase, which oxidizes cytosolic NADH to  $\text{NAD}^+$  while forming glycerol 3-phosphate from dihydroxyacetone phosphate (DHAP). On the outer face of the inner mitochondrial membrane, there exists another isoform of glycerol-3-phosphate dehydrogenase that is FAD-dependent. This mitochondrial FAD is the oxidizing agent, and ends up being reduced to  $\text{FADH}_2$ . Once reduced,  $\text{FADH}_2$  proceeds to transfer its electrons to the ETC via Complex II, thus generating 1.5 ATP for every molecule of cytosolic NADH that participates in this pathway, which is shown in Figure 10.14.

**Figure 10.14 Glycerol-3-Phosphate Shuttle**

**Malate-aspartate shuttle:** Cytosolic oxaloacetate, which cannot pass through the inner mitochondrial membrane, is reduced to malate, which can. This is accomplished by cytosolic malate dehydrogenase. Accompanying this reduction is the oxidation of cytosolic NADH to  $\text{NAD}^+$ . Once malate crosses into the matrix, mitochondrial malate dehydrogenase reverses the reaction to form mitochondrial NADH. Now that NADH is in the matrix, it can pass along its electrons to the ETC via Complex I and generate 2.5 ATP per molecule of NADH. Recycling the malate requires oxidation to oxaloacetate, which can be transaminated to form aspartate. Aspartate crosses into the cytosol, and can be reconverted to oxaloacetate to restart the cycle, as shown in Figure 10.15.

**Figure 10.15 Malate-Aspartate Shuttle**

**MCAT CONCEPT CHECK 10.3**

Before you move on, assess your understanding of the material with these questions.

1. Which

complex(es) are associated with each of the following? (circle all that apply) Pumping a proton into the intermembrane Acquiring electrons from NADH Acquiring electrons from FADH<sub>2</sub> Having the highest reduction potential

2. What role does the electron transport chain play in the generation of ATP?

3. Based on its needs, which of the two shuttle mechanisms is cardiac muscle most likely to utilize? Why?

### 10.4 Oxidative Phosphorylation

After Chapter 10.4, you will be able to:

- Compare and contrast the ETC and oxidative phosphorylation
- Explain why the ETC generates more ATP than the direct reduction of oxygen by

We have arrived at the payout site of aerobic respiration: ATP synthesis. Knowing the nuances of ATP synthesis is an absolute must by Test Day. The link between electron transport and ATP synthesis starts with a protein complex called ATP synthase, which spans the entire inner mitochondrial membrane and protrudes into the matrix. A small fraction—only 13 of approximately 100 polypeptides—that are necessary for oxidative phosphorylation are encoded by mitochondrial DNA. The significance of this fact is that mitochondrial DNA has a mutation rate nearly ten times higher than that of nuclear DNA. The proton-motive force interacts with the portion of ATP synthase that spans the membrane, which is called the F<sub>0</sub> portion. F<sub>0</sub> functions as an ion channel, so protons travel through F<sub>0</sub> along their gradient back into the matrix. As this happens, a process called chemiosmotic coupling allows the chemical energy of the gradient to be harnessed as a means of phosphorylating ADP, thus forming ATP. In other words, the ETC generates a high concentration of protons in the intermembrane space; the protons then flow through the F<sub>0</sub> ion channel of ATP synthase back into the matrix. As this happens, the other portion of ATP synthase, which is called the F<sub>1</sub> portion, utilizes the energy released from this electrochemical gradient to phosphorylate ADP to ATP, as demonstrated in Figure 10.16. The specific mechanism by which ADP is actually phosphorylated is still a matter of debate.

### ATP Synthase Reaction

ATP synthase generates ATP from ADP and inorganic phosphate by allowing high-energy protons to move down the concentration gradient created by the electron transport chain. Chemiosmotic coupling describes a direct relationship between the proton gradient and ATP synthesis. It is the predominant mechanism accepted in the scientific

community when describing oxidative phosphorylation. However, another mechanism called conformational coupling suggests that the relationship between the proton gradient and ATP synthesis is indirect. Instead, ATP is released by the synthase as a result of conformational change caused by the gradient. In this mechanism, the F1 portion of ATP synthase is reminiscent of a turbine, spinning within a stationary compartment to facilitate the harnessing of gradient energy for chemical bonding. So we now know how we generate ATP, but how much energy was required to do so? When the proton-motive force is dissipated through the F0 portion of ATP synthase, the free energy change of the reaction,  $\Delta G'$ , is 220 kJ, a highly exergonic reaction. This makes sense because phosphorylating ADP to form ATP is an endergonic process. So, by coupling these reactions, the energy harnessed from one reaction can drive the other. When tackling complex mechanisms such as chemiosmotic coupling on Test Day, it's easy to make mistakes such as interpreting a pH drop to be a  $[H^+]$  drop instead of a rise in proton concentration. Always read actively to avoid such mistakes. Uncouplers are compounds that prevent ATP synthesis without affecting the ETC, thus greatly decreasing the efficiency of the ETC/oxidative phosphorylation pathway. Because ADP builds up and ATP synthesis decreases, the body responds to this perceived lack of energy by increasing  $O_2$  consumption and NADH oxidation. The energy produced from the transport of electrons is released as heat. An example would be the fever experienced with toxic levels of salicylates, including aspirin. Because the citric acid cycle provides the electron-rich molecules that feed into the ETC, it should come as no surprise that the rates of oxidative phosphorylation and the citric acid cycle are closely coordinated. Always think of  $O_2$  and ADP as the key regulators of oxidative phosphorylation. If  $O_2$  is limited, the rate of oxidative phosphorylation decreases, and the concentrations of NADH and  $FADH_2$  increase. The accumulation of NADH, in turn, inhibits the citric acid cycle. The coordinated regulation of these pathways is known as respiratory control. In the presence of adequate  $O_2$ , the rate of oxidative phosphorylation is dependent on the availability of ADP. The concentrations of ADP and ATP are reciprocally related; an accumulation of ADP is accompanied by a decrease in ATP and the amount of energy available

to the cell. Therefore, ADP accumulation signals the need for ATP synthesis. ADP allosterically activates isocitrate dehydrogenase, thereby increasing the rate of the citric acid cycle and the production of NADH and FADH<sub>2</sub>. The elevated levels of these reduced coenzymes, in turn, increase the rate of electron transport and ATP synthesis. MCAT CONCEPT CHECK 10.4 Before you move on, assess your understanding of the material with these questions.

1. What is the difference between the ETC and oxidative phosphorylation? What links them?
2. The  $\Delta G^\circ$  of NADH reducing oxygen directly is significantly greater than any individual step along the electron transport chain. If this is the case, why does transferring electrons along the ETC generate more ATP than direct reduction of oxygen by NADH? Both topics discussed in this chapter—the citric acid cycle and oxidative phosphorylation—take place in the mitochondria. In the mitochondrial matrix, the citric acid cycle completely oxidizes acetyl-CoA to carbon dioxide. While this happens, energy is conserved via reduction reactions, forming high-energy electron carriers such as FADH<sub>2</sub> and NADH. ATP is also indirectly formed via GTP synthesis. These electron-rich carriers then transfer their electrons to the electron transport chain, which is located along the inner mitochondrial membrane. A series of oxidation–reduction reactions occurs in specific complexes until oxygen, the final electron acceptor, gets reduced and forms H<sub>2</sub>O. This electrical pathway generates an electrochemical proton gradient that is harnessed by ATP synthase to generate ATP. The link between these two processes is highlighted by the fact that control of the citric acid cycle is NADH-dependent. When NADH accumulates, isocitrate dehydrogenase inhibition occurs, thus stopping both the citric acid cycle and electron transport chain. It is worth noting that, while glycolysis is a major source of acetyl-CoA for the citric acid cycle, fatty acids also serve as an important source. In the next chapter, we turn our attention to the metabolism of two other types of biomolecules: lipids and amino acids. You’ve reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources! Acetyl-CoA contains a high-energy thioester bond that can be used to drive other reactions when hydrolysis occurs. It can be formed from pyruvate via pyruvate dehydrogenase complex, a five-enzyme complex

in the mitochondrial matrix that forms—and is also inhibited by—acetyl-CoA and NADH. Pyruvate dehydrogenase (PDH) oxidizes pyruvate, creating CO<sub>2</sub>; it requires thiamine pyrophosphate (vitamin B1, TPP) and Mg<sup>2+</sup>. Dihydrolipoyl transacetylase oxidizes the remaining two-carbon molecule using lipoic acid, and transfers the resulting acetyl group to CoA, forming acetyl-CoA. Dihydrolipoyl dehydrogenase uses FAD to reoxidize lipoic acid, forming FADH<sub>2</sub>. This FADH<sub>2</sub> can later transfer electrons to NAD<sup>+</sup>, forming NADH that can feed into the electron transport chain. Pyruvate dehydrogenase kinase phosphorylates PDH when ATP or acetyl-CoA levels are high, turning it off. Pyruvate dehydrogenase phosphatase dephosphorylates PDH when ADP levels are high, turning it on. Acetyl-CoA can be formed from fatty acids, which enter the mitochondria using carriers. The fatty acid couples with CoA in the cytosol to form fatty acyl-CoA, which moves to the intermembrane space. The acyl (fatty acid) group is transferred to carnitine to form acyl-carnitine, which crosses the inner membrane. The acyl group is transferred to a mitochondrial CoA to re-form fatty acyl-CoA, which can undergo β-oxidation to form acetyl-CoA. Acetyl-CoA can be formed from the carbon skeletons of ketogenic amino acids, ketone bodies, and alcohol.

**Reactions of the Citric Acid Cycle**

The citric acid cycle takes place in the mitochondrial matrix. Its main purpose is to oxidize carbons in intermediates to CO<sub>2</sub> and generate high-energy electron carriers (NADH and FADH<sub>2</sub>) and GTP. Key enzymes and reactions: Citrate synthase couples acetyl-CoA to oxaloacetate and then hydrolyzes the resulting product, forming citrate and CoASH. This enzyme is regulated by negative feedback from ATP, NADH, succinyl-CoA, and citrate. Aconitase isomerizes citrate to isocitrate. Isocitrate dehydrogenase oxidizes and decarboxylates isocitrate to form α-ketoglutarate. This enzyme generates the first CO<sub>2</sub> and first NADH of the cycle. As the rate-limiting step of the citric acid cycle, it is heavily regulated: ATP and NADH are inhibitors; ADP and NAD<sup>+</sup> are activators. α-Ketoglutarate dehydrogenase complex acts similarly to PDH complex, metabolizing α-ketoglutarate to form succinyl-CoA. This enzyme generates the second CO<sub>2</sub> and second NADH of the cycle. It is inhibited by ATP, NADH, and succinyl-CoA; it is activated by ADP and Ca<sup>2+</sup>. Succinyl-CoA synthetase hydrolyzes



the thioester bond in succinyl-CoA to form succinate and CoASH. This enzyme generates the one GTP generated in the cycle. Succinate dehydrogenase oxidizes succinate to form fumarate. This flavoprotein is anchored to the inner mitochondrial membrane because it requires FAD, which is reduced to form the one FADH<sub>2</sub> generated in the cycle. Fumarase hydrolyzes the alkene bond of fumarate, forming malate. Malate dehydrogenase oxidizes malate to oxaloacetate. This enzyme generates the third and final NADH of the cycle.

**The Electron Transport Chain** The electron transport chain takes place on the matrix-facing surface of the inner mitochondrial membrane. NADH donates electrons to the chain, which are passed from one complex to the next. As the ETC progresses, reduction potentials increase until oxygen, which has the highest reduction potential, receives the electrons. Complex I (NADH-CoQ oxidoreductase) uses an iron-sulfur cluster to transfer electrons from NADH to flavin mononucleotide (FMN), and then to coenzyme Q (CoQ), forming CoQH<sub>2</sub>. Four protons are translocated by Complex I. Complex II (Succinate-CoQ oxidoreductase) uses an iron-sulfur cluster to transfer electrons from succinate to FAD, and then to CoQ, forming CoQH<sub>2</sub>. No proton pumping occurs at Complex II. Complex III (CoQH<sub>2</sub>-cytochrome c oxidoreductase) uses an iron-sulfur cluster to transfer electrons from CoQH<sub>2</sub> to heme, forming cytochrome c as part of the Q cycle. Four protons are translocated by Complex III. Complex IV (cytochrome c oxidase) uses cytochromes and Cu<sup>2+</sup> to transfer electrons in the form of hydride ions (H<sup>-</sup>) from cytochrome c to oxygen, forming water. Two protons are translocated by Complex IV.

NADH cannot cross the inner mitochondrial membrane. Therefore, one of two available shuttle mechanisms to transfer electrons in the mitochondrial matrix must be used. In the glycerol 3-phosphate shuttle, electrons are transferred from NADH to dihydroxyacetone phosphate (DHAP), forming glycerol 3-phosphate. These electrons can then be transferred to mitochondrial FAD, forming FADH<sub>2</sub>. In the malate-aspartate shuttle, electrons are transferred from NADH to oxaloacetate, forming malate. Malate can then cross the inner mitochondrial membrane and transfer the electrons to mitochondrial NAD<sup>+</sup>, forming NADH. The proton-motive force is the electrochemical gradient generated by the electron transport chain

across the inner mitochondrial membrane. The intermembrane space has a higher concentration of protons than the matrix; this gradient stores energy, which can be used to form ATP via chemiosmotic coupling. ATP synthase is the enzyme responsible for generating ATP from ADP and an inorganic phosphate (Pi). The F<sub>0</sub> portion is an ion channel, allowing protons to flow down the gradient from the intermembrane space to the matrix. The F<sub>1</sub> portion uses the energy released by the gradient to phosphorylate ADP into ATP. The following is a summary of the energy yield of the various carbohydrate metabolism processes: Glycolysis generates 2 NADH and 2 ATP. Pyruvate dehydrogenase generates 1 NADH per molecule of pyruvate. Because each glucose forms two molecules of pyruvate, this complex produces a net of 2 NADH. The citric acid cycle generates 3 NADH, 1 FADH<sub>2</sub>, and 1 GTP (6 NADH, 2 FADH<sub>2</sub>, and 2 GTP per molecule of glucose). Each NADH yields 2.5 ATP; 10 NADH form 25 ATP. Each FADH<sub>2</sub> yields 1.5 ATP; 2 FADH<sub>2</sub> form 3 ATP. GTP are converted to ATP. 2 ATP from glycolysis + 2 ATP (GTP) from the citric acid cycle + 25 ATP from NADH + 3 ATP from FADH<sub>2</sub> = 32 ATP per molecule of glucose (optimal). Inefficiencies of the system and variability between cells make 30–32 ATP/glucose the commonly accepted range for energy yield.

Answers to Concept Checks 1. Pyruvate + CoASH + NAD<sup>+</sup> → acetyl-CoA + CO<sub>2</sub> + NADH + H<sup>+</sup>

Mechanism of Conversion to Acetyl-CoA Shuttle acyl group from cytosolic CoA-SH to mitochondrial CoA-SH via carnitine; then undergo β-oxidation Transaminate to lose nitrogen; convert carbon skeleton into ketone body, which can be converted into acetyl-CoA Reverse of ketone body formation Alcohol dehydrogenase and acetaldehyde dehydrogenase convert alcohol 1. Complete oxidation of carbons in intermediates to CO<sub>2</sub> so that reduction reactions can be coupled with CO<sub>2</sub> formation, thus forming energy carriers such as NADH and FADH<sub>2</sub> for the electron transport 2. Isocitrate dehydrogenase ATP, NADH, succinyl-CoA, citrate ATP, NADH, succinyl-CoA 1. • Pumping a proton into the intermembrane space: I, III, and IV Acquiring electrons from NADH: I Acquiring electrons from FADH<sub>2</sub>: II Having the highest reduction potential: IV (reduction potentials increase along the ETC) 2. The electron transport chain generates the proton-motive force, an electrochemical gradient across the inner

mitochondrial membrane, which provides the energy for ATP synthase to function. 3. The malate-aspartate shuttle. Because this mechanism is the more efficient one, it makes sense for a highly aerobic organ such as the heart to utilize it in order to maximize its ATP yield. 1. The ETC is made up of the physical set of intermembrane proteins located on the inner mitochondrial matrix, and they undergo oxidation-reduction reactions as they transfer electrons to oxygen, the final electron acceptor. As electrons are transferred, a proton-motive force is generated in the intermembrane space. Oxidative phosphorylation is the process by which ATP is generated via harnessing the proton gradient, and it utilizes ATP synthase to do so. 2. By splitting up electron transfer into several complexes, enough energy is released to facilitate the creation of a proton gradient at many locations, rather than just one. The greater the proton gradient is, the greater the ATP generation will be. Direct reduction of oxygen by NADH would release a significant amount of energy to the environment, resulting in inefficient electron transport. Science Mastery Assessment Phosphofructokinase-1 (PFK-1), which catalyzes the rate-limiting step of glycolysis, is the only enzyme listed here that functions under anaerobic conditions. The other enzymes are all involved in the oxygen-requiring processes discussed in this chapter. Succinate dehydrogenase, (A), appears in both the citric acid cycle and as part of Complex II of the electron transport chain. Isocitrate dehydrogenase, (C), catalyzes the rate-limiting step of the citric acid cycle. Pyruvate dehydrogenase, (D), is one of the five enzymes that make up the pyruvate dehydrogenase complex. The increased permeability of the inner mitochondrial membrane allows the proton-motive force to be dissipated through locations besides the F<sub>0</sub> portion of ATP synthase. Therefore, ATP synthase is less active and is forming less ATP, invalidating (A) and (C). The body will attempt to regenerate the proton-motive force by increasing fuel catabolism, eliminating (D). This increase in fuel use requires more oxygen utilization in the electron transport chain. The citric acid cycle takes place in the mitochondrial matrix, not the outer mitochondrial membrane. While most citric acid cycle enzymes are located within the matrix, succinate dehydrogenase is located on the inner It is not necessary to have all the net

reactions memorized for each metabolic process to answer this question; all we need is to identify a few key reactants and products. In this case, we start with acetyl-CoA and end with CoASH. We also notice that in this reaction,  $\text{NAD}^+$  and FAD are reduced to NADH and  $\text{FADH}_2$ , and that  $\text{CO}_2$  is formed. The only metabolic process in which all of the above reactions would occur is the citric acid cycle, also called the tricarboxylic acid (TCA) or Krebs cycle. This question is testing our general knowledge of cellular respiration. Notice that all types of cellular respiration (aerobic and anaerobic) start with the degradation of glucose by glycolysis. In aerobic respiration, oxygen is the final electron acceptor, and water is therefore produced at the end of the electron transport chain. While oxygen is needed for aerobic respiration in order to produce the optimal 32 molecules of ATP per glucose, it is not the only method by which ATP is produced. Glycolysis still provides 2 ATP per glucose without the need for oxygen, thus making (B) and (D) incorrect. Water, mentioned in (C), is produced in aerobic metabolism, not consumed. Fat molecules stored in adipose tissue can be hydrolyzed by lipases to fatty acids and glycerol. While glycerol can be converted into glyceraldehyde 3-phosphate, a glycolytic intermediate, a fatty acid must first be activated in the cytoplasm by coupling the fatty acid to CoASH, forming fatty acyl-CoA. The fatty acid is then transferred to a molecule of carnitine, which can carry it across the inner mitochondrial membrane. Once inside, the fatty acid is transferred to a mitochondrial CoASH, re-forming fatty acyl-CoA. Through fatty acid oxidation, this fatty acyl-CoA can become acetyl-CoA, which enters the citric acid cycle. Based on the wording of this question, three choices are used to produce acetyl-CoA and one is not. As part of aerobic metabolism, decarboxylation of pyruvate by the pyruvate dehydrogenase complex yields acetyl-CoA, NADH, and  $\text{CO}_2$ . Other sources of acetyl-CoA include amino acid catabolism, beta oxidation of fatty acids, and alcohol metabolism. Fatty acids are produced via reduction of acetyl-CoA and cannot be further reduced, making (C) correct. Cytochrome c carries electrons from CoQH<sub>2</sub>-cytochrome c oxidoreductase (Complex III) to cytochrome c oxidase (Complex IV) as part of the electron transport chain. The ETC takes place on the inner mitochondrial membrane. During oxidative phosphorylation, energy is harvested from

the energy carriers FADH<sub>2</sub> and NADH in order to form ATP. One molecule of mitochondrial FADH<sub>2</sub> is oxidized to produce 1.5 molecules of ATP. Similarly, one molecule of mitochondrial NADH is oxidized to produce 2.5 molecules of ATP in the electron transport chain. Thioester links release a great deal of energy when hydrolyzed, making them well-suited as respiration reaction drivers. They are particularly useful because they release more energy than typical ester cleavage. It is thioester formation, not hydrolysis, that requires a great deal of energy, making (D) The conversion of GDP to GTP is a phosphorylation reaction, in which a phosphate group is added to a molecule. Such reactions are catalyzed by kinases. Nomenclature is helpful here, as nucleosidediphosphate kinase is the only enzyme that contains kinase in its name. The wording of these answer choices is critical. The electrons from cytosolic NADH can enter the mitochondrion through one of two shuttle mechanisms: the glycerol 3-phosphate shuttle, which ultimately moves these electrons to mitochondrial FAD, and the malate-aspartate shuttle, which ultimately moves these electrons to mitochondrial NAD<sup>+</sup>. If the electrons are transferred using the malate-aspartate shuttle, then no energy is lost, making (A) and (D) incorrect. NADH cannot enter the matrix directly, making (B) incorrect. It is the fact that electrons can use more than one pathway—one of which loses energy that could be used for ATP synthesis—that accounts for the potentially decreased yield of ATP from cytosolic Uncouplers inhibit ATP synthesis without affecting the electron transport chain. Because the body must burn more fuel to maintain the proton-motive force, glycogen stores will be mobilized to feed into glycolysis, then the TCA, and finally oxidative phosphorylation. Complex II is the only complex of the ETC that does not contribute to the proton gradient. Complexes I and III each add four protons to the gradient; Complex IV adds two protons to the gradient. While all of the other answers contribute to energy production, it is the electrochemical gradient (proton-motive force) that directly drives the phosphorylation of ATP by the F<sub>1</sub> portion of ATP synthase. Consult your online resources for additional practice.

Biochemistry Chapter 2 Biochemistry Chapter 4 Carbohydrate Structure and Function  
Biochemistry Chapter 9 Carbohydrate Metabolism I Biochemistry Chapter 11 Lipid and Amino

Acid Metabolism Biochemistry Chapter 12 Bioenergetics and Regulation of Metabolism  
General Chemistry Chapter 12 Lipid and Amino Acid

Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate.

**How to Use This Assessment**

If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to ensure that you now understand how to solve each one.

If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect.

If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. Which of the following hormones does NOT directly regulate the activity of hormone-sensitive lipase in adipose tissue?

2. What is the fate of long-chain fatty acids that are contained within A. Transport into chylomicrons released into the lymphatic B. Transport into chylomicrons released into the circulatory C. Direct diffusion across the intestine into the lymphatic system D. Direct diffusion across the intestine into the circulatory system

3. During fatty acid mobilization, which of the following occur(s)? I. HSL is

activated. II. Free fatty acids are released. III. Gluconeogenesis proceeds in adipocytes. A. I only B. III only C. I and II only D. II and III only

4. How do chylomicrons and VLDL differ? A. Chylomicrons contain apoproteins, VLDL do not. B. Chylomicrons are synthesized in the intestine, VLDL are synthesized in the liver. C. Chylomicrons transport triacylglycerol, VLDL transport D. VLDL are another term for chylomicron remnants; they differ in

5. Which of the following could result from an absence of I. An inability to secrete lipid transport lipoproteins II. An inability to endocytose lipoproteins III. A decreased ability to remove excess cholesterol from blood A. I only B. III only C. I and II only D. I, II, and III

6. Statin drugs inhibit HMG-CoA reductase. As such, they are likely A. hypercholesterolemia (high cholesterol). B. hypertriglyceridemia (high triacylglycerol). C. hypocholesterolemia (low cholesterol). D. visceral adiposity (obesity).

7. What is the function of LCAT? A. LCAT catalyzes the production of cholesteryl esters. B. LCAT catalyzes the production of cholesterol. C. LCAT catalyzes the transfer of cholesteryl esters. D. LCAT catalyzes the transfer of cholesterol.

8. Which fatty acid can be synthesized by humans?

9. Which of the following best characterizes the process of fatty acid A. Two reductions followed by a dehydration and bond formation B. Reduction followed by activation, bond formation, dehydration, C. Activation followed by bond formation, reduction, dehydration, D. Activation followed by bond formation, oxidation, dehydration,

10. Which of the following best describes how the body creates or processes ketone bodies? A. Ketone bodies are produced in the peroxisomes of liver cells during periods of fasting. B. Acetyl-CoA is converted into acetoacetate, 3-hydroxybutyrate, or acetone, all of which are utilized for energy. C. Ketone bodies are produced in the mitochondria of liver cells after prolonged fasting. D. The brain is the first organ to use ketone bodies.

11. The majority of triacylglycerols stored in adipocytes originate A. synthesis in the adipocyte. B. dietary intake. C. ketone bodies. D. synthesis in the liver.

12. 2,4-Dienoyl-CoA reductase is used in the oxidation of: A. saturated fatty acids. B. monounsaturated fatty acids. C. polyunsaturated fatty acids. D. ketone bodies.

13. Which of the following is true regarding ketolysis? A. Ketolysis occurs only in the brain. B. Ketolysis occurs in the liver. C. Ketolysis generates acetyl-CoA. D. Ketolysis increases

glucose metabolism. 14. Which of the following amino acids will provide the most energy 15. Which of the following is LEAST likely to result from protein degradation and processing by the liver? A. Fatty acids Lipid and Amino Acid Metabolism In This Chapter 11.1 Lipid Digestion and Absorption 11.2 Lipid Mobilization 11.3 Lipid Transport VLDL (Very-Low-Density Lipoprotein) IDL (Intermediate-Density Lipoprotein) LDL (Low-Density Lipoprotein) HDL (High-Density Lipoprotein) 11.4 Cholesterol Metabolism 11.5 Fatty Acids and Triacylglycerols 11.6 Ketone Bodies 11.7 Protein Catabolism The content in this chapter should be relevant to about 2% of all questions about Biochemistry on the MCAT. This chapter covers material from the following AAMC content category: 1D: Principles of bioenergetics and fuel molecule metabolism For weeks before the winter season begins, bears and certain mammals increase their food intake to prepare for hibernation. During this time, they increase their weight by storing energy. Different organisms store fuel and supplies in different ways. Hamsters store extra food in pouches in their cheeks. Cacti absorb and conserve water in preparation for dry seasons. But hibernating animals store extra calories as fat. Over the course of the winter, fat stores are mobilized and metabolized for basic bodily functions, which are minimal during hibernation. Come spring and summer, these reserves will be replenished in preparation for the next winter season. Humans also store extra energy as fat. While we may not hibernate through the winter, fat stores allow us to store energy to use during prolonged periods without Chapter 11 contains some of the most complex and difficult material in this book. However, the content within this chapter is not particularly high-yield on Test Day, as can be seen in the chapter profile above. This chapter is still worth reviewing, but its content will be most relevant to students seeking full mastery of all testable content for an extremely competitive As discussed in Chapter 8 of MCAT Biochemistry Review, lipids play a major role in maintaining the structure and function of cells; however, they also have important roles as storage molecules for energy and in biological signaling. In this chapter, we'll examine the metabolism of lipids, starting with ingestion of food particles and continuing through absorption, transport, and energy catabolism. We will also cover energy storage via lipid synthesis, as well



as the metabolism of cholesterol and ketone bodies. In addition, we will learn about how protein degradation feeds into lipid and carbohydrate pathways and the urea cycle.

### 11.1 Lipid Digestion and Absorption

After Chapter 11.1, you will be able to:

- Differentiate between lipid digestion in the stomach and lipid digestion in the small intestine
- Identify the methods by which lipids can enter circulation
- Describe the structure of a micelle

In addition to being a major source of energy in the body, lipids serve a variety of other functions in the body. For instance, some fat-soluble vitamins play roles as coenzymes; prostaglandins and steroid hormones are necessary in the control and maintenance of homeostasis. Aberrant lipid metabolism may also be associated with clinical manifestations such as atherosclerosis and obesity.

Digestion is covered in Chapter 9 of MCAT Biology Review. Dietary fat consists mainly of triacylglycerols, with the remainder comprised of cholesterol, cholesteryl esters, phospholipids, and free fatty acids. Lipid digestion is minimal in the mouth and stomach; lipids are transported to the small intestine essentially intact. Upon entry into the duodenum, emulsification occurs, which is the mixing of two normally immiscible liquids (in this case, fat and water). Formation of an emulsion increases the surface area of the lipid, which permits greater enzymatic interaction and processing. Emulsification is aided by bile, which contains bile salts, pigments, and cholesterol; bile is secreted by the liver and stored in the gallbladder. Finally, the pancreas secretes pancreatic lipase, colipase, and cholesterol esterase into the small intestine; together, these enzymes hydrolyze the lipid components to 2-monoacylglycerol, free fatty acids, and cholesterol.

Figure 11.1 summarizes the digestion and absorption of dietary lipids.

### 11.1.1 Absorption of Lipids

Emulsification is followed by absorption of fats by intestinal cells. Free fatty acids, cholesterol, 2-monoacylglycerol, and bile salts contribute to the formation of micelles, which are clusters of amphipathic lipids that are soluble in the aqueous environment of the intestinal lumen. Essentially, micelles are water-soluble spheres with a lipid-soluble interior. Micelles are vital in digestion, transport, and absorption of lipid-soluble substances starting from the duodenum all the way to the end of the ileum. At the end of the ileum, bile salts are actively reabsorbed and recycled; any fat that remains in the intestine will pass into

the colon, and ultimately ends up in Absorption in the small intestine and colon follows a characteristic pattern. This is a good time to review digestion, discussed in Chapter 9 of MCAT Biology Review, to create a complete schema for the absorption and metabolism of all the macronutrients. Micelles diffuse to the brush border of the intestinal mucosal cells where they are absorbed. The digested lipids pass through the brush border, where they are absorbed into the mucosa and re-esterified to form triacylglycerols and cholesteryl esters and packaged, along with certain apoproteins, fat-soluble vitamins, and other lipids, into chylomicrons. Chylomicrons leave the intestine via lacteals, the vessels of the lymphatic system, and re-enter the bloodstream via the thoracic duct, a long lymphatic vessel that empties into the left subclavian vein at the base of the neck. The more water-soluble short-chain fatty acids can be absorbed by simple diffusion directly into the

**MCAT CONCEPT CHECK 11.1** Before you move on, assess your understanding of the material with these questions.

1. When lipids leave the stomach, what stages of digestion have been accomplished? What enzymes are added to accomplish the next phase?
2. True or False: All lipids enter the circulation through the lymphatic system.
3. Describe the structure of a micelle.

**11.2 Lipid Mobilization** After Chapter 11.2, you will be able to:

- Identify the conditions and hormones that promote lipid mobilization
- Predict the ratio of free fatty acids per glycerol molecule broken down via lipid

At night, the body is in the postabsorptive state, utilizing energy stores instead of food for fuel. In the postabsorptive state, fatty acids are released from adipose tissue and used for energy. Although human adipose tissue does not respond directly to glucagon, a fall in insulin levels activates a hormone-sensitive lipase (HSL) that hydrolyzes triacylglycerols, yielding fatty acids and glycerol. Epinephrine and cortisol can also activate HSL, as shown in Figure 11.2; we will discuss the effects of these hormones on metabolism in more detail in the next chapter. Released glycerol from fat may be transported to the liver for glycolysis or gluconeogenesis. HSL is effective within adipose cells, but lipoprotein lipase (LPL) is necessary for the metabolism of chylomicrons and very-low-density lipoproteins (VLDL). LPL is an enzyme that can release free fatty acids from triacylglycerols in

**Figure 11.2 Mobilization of Triacylglycerols**

and Metabolism by the Liver MCAT CONCEPT CHECK 11.2 Before you move on, assess your understanding of the material with these questions. 1. A patient who has diabetes begins insulin injections for management of blood glucose levels. What is the expected impact on the patient's weight? 2. What is the ratio of free fatty acids to glycerol produced through lipid mobilization?

11.3 Lipid Transport After Chapter 11.3, you will be able to: Describe the means of transport for free fatty acids in the blood Order lipoproteins according to percentage of protein and lipid transported Explain the relationship between the liver and the intestinal epithelium in relation to Recall the major structural components of a lipoprotein While free fatty acids are transported through the blood in association with albumin, a carrier protein, triacylglycerol and cholesterol are transported in the blood as lipoproteins: aggregates of apolipoproteins and lipids, as shown in Figure 11.3. Lipoproteins are named according to their density, which increases in direct proportion to the percentage of protein in the particle. Chylomicrons are the least dense, with the highest fat-to-protein ratio. VLDL (very-low-density lipoprotein) is slightly more dense, followed by IDL (intermediate-density), LDL (low-density), and HDL (high-density). The main functions of each lipoprotein are shown in Table 11.1. Note that chylomicrons and VLDL primarily carry triacylglycerols, but also contain small quantities of cholesteryl esters. LDL and HDL are primarily cholesterol transport molecules. Figure 11.3 Lipoprotein Structure Table 11.1 Classes of Lipoproteins

Lipoprotein	Primary Function
Chylomicrons	Transport dietary triacylglycerols, cholesterol, and cholesteryl esters from intestine to tissues
VLDL	Transports triacylglycerols and fatty acids from liver to tissues
IDL	Picks up cholesteryl esters from HDL to become LDL
LDL	Picked up by the Delivers cholesterol into cells
HDL	Picks up cholesterol accumulating in blood vessels
LDL	Delivers cholesterol to liver and steroidogenic tissues
HDL	Transfers apolipoproteins to other

Chylomicrons are highly soluble in both lymphatic fluid and blood and function in the transport of dietary triacylglycerols, cholesterol, and cholesteryl esters to other tissues. Assembly of chylomicrons occurs in the intestinal lining and results in a nascent chylomicron that contains lipids VLDL (Very-Low-Density Lipoprotein) VLDL metabolism is similar to that of chylomicrons; however, VLDL is produced and assembled in liver cells. Like chylomicrons, the

main function of VLDL is the transport of triacylglycerols to other tissues. VLDLs also contain fatty acids that are synthesized from excess glucose or retrieved from chylomicron remnants. Chylomicrons and VLDL primarily carry triacylglycerols. LDL and HDL primarily carry cholesterol. IDL is intermediate; it is a transition state between VLDL and LDL, occurring as the primary lipid within the lipoprotein changes from triacylglycerol to cholesterol. IDL (Intermediate-Density Lipoprotein) Once triacylglycerol is removed from VLDL, the resulting particle is referred to as either a VLDL remnant or IDL. Some IDL is reabsorbed by the liver by apolipoproteins on its exterior, and some is further processed in the bloodstream. For example, some IDL picks up cholesteryl esters from HDL to become LDL. IDL thus exists as a transition particle between triacylglycerol transport (associated with chylomicrons and VLDL) and cholesterol transport (associated with LDL and HDL). This process is shown in Figure 11.4.

Figure 11.4 Lipid Transport in Lipoproteins TGL = triacylglycerol; CE = cholesteryl esters; chol = cholesterol

LDL (Low-Density Lipoprotein) Although both LDL and HDL are primarily cholesterol particles, the majority of the cholesterol measured in blood is associated with LDL. The normal role of LDL is to deliver cholesterol to tissues for biosynthesis. However, cholesterol also plays an important role in cell membranes. In addition, bile acids and salts are made from cholesterol in the liver, and many other tissues require cholesterol for steroid hormone synthesis. When a physician orders a blood test for cholesterol, they are actually measuring levels of LDL and HDL in the blood. HDL is often considered “good” cholesterol because it picks up excess cholesterol from blood vessels for excretion. HDL (High-Density Lipoprotein) HDL is synthesized in the liver and intestines and released as dense, protein-rich particles into the blood. HDL contains apolipoproteins used for cholesterol recovery—that is, the cleaning up of excess cholesterol from blood vessels for excretion. HDL also delivers some cholesterol to steroidogenic tissues and transfers necessary apolipoproteins to some of the

Apolipoproteins, also referred to as apoproteins, form the protein component of the lipoproteins described above. Apolipoproteins are receptor molecules and are involved in signaling. While it is highly unlikely that specific functions of each apolipoprotein will be tested

on the MCAT, they are briefly summarized below to illustrate their diverse purposes: apoA-I: activates LCAT, an enzyme that catalyzes cholesterol esterification; apoB-48: mediates chylomicron secretion; apoB-100: permits uptake of LDL by the liver; apoC-II: activates lipoprotein lipase; apoE: permits uptake of chylomicron remnants and VLDL by the liver.

**MCAT CONCEPT CHECK 11.3** Before you move on, assess your understanding of the material with these questions.

1. What is the primary method of transporting free fatty acids in the blood?
2. Order the lipoproteins from greatest percentage of protein to least percentage of protein. Circle the molecules that are primarily involved in triacylglycerol transport.
3. Lipoproteins are synthesized primarily by which two organs?
4. When physicians order a lipid panel to evaluate a patient, which value do they prefer to see over a minimum threshold rather than below a maximum?

**11.4 Cholesterol Metabolism** After Chapter 11.4, you will be able to:

- Predict optimal conditions for HMG-CoA reductase activity
- Recall the functions of the citrate shuttle, HMG-CoA reductase, LCAT, and CETP

Cholesterol is a ubiquitous component of all cells in the human body and plays a major role in the synthesis of cell membranes, steroid hormones, bile acids, and vitamin D. Most cells derive their cholesterol from LDL or HDL, but some cholesterol may be synthesized *de novo*. *De novo* synthesis of cholesterol occurs in the liver and is driven by acetyl-CoA and ATP. The citrate shuttle carries mitochondrial acetyl-CoA into the cytoplasm, where synthesis occurs. NADPH (from the pentose phosphate pathway) supplies reducing equivalents. Synthesis of mevalonic acid in the smooth endoplasmic reticulum (SER) is the rate-limiting step in cholesterol biosynthesis and is catalyzed by 3-hydroxy-3-methylglutaryl (HMG) CoA reductase. Cholesterol synthesis is regulated in several ways. First, increased levels of cholesterol can inhibit further synthesis by a feedback inhibition mechanism. Next, insulin promotes cholesterol synthesis. Control over *de novo* cholesterol synthesis is also dependent on regulation of HMG-CoA reductase gene expression in the cell. Specialized enzymes involved in the transport of cholesterol include LCAT and CETP. Lecithin-cholesterol acyltransferase (LCAT) is an enzyme found in the bloodstream that is activated by HDL apoproteins. LCAT adds a fatty acid to cholesterol, which produces soluble cholesteryl esters such as those in HDL.

HDL cholesteryl esters can be distributed to other lipoproteins like IDL, which becomes LDL by acquiring these cholesteryl esters. The cholesteryl ester transfer protein (CETP) facilitates this transfer process. MCAT CONCEPT CHECK 11.4 Before you move on, assess your understanding of the material with these questions. 1. Under what conditions is HMG-CoA reductase most active? In what cellular region does it exist? 2. What proteins are specific to the formation and transmission of cholesteryl esters, and what are their functions?

### 11.5 Fatty Acids and Triacylglycerols

After Chapter 11.5, you will be able to: Recall and sequence the five steps in the addition of acetyl-CoA to a growing fatty Differentiate  $\beta$ -oxidation of unsaturated fatty acids from that of saturated fatty acids Identify the cellular locations involved in fatty acid synthesis and modification Name fatty acids and predict their structure based on their nomenclature: Fatty acids are long-chain carboxylic acids. The carboxyl carbon is carbon 1, and carbon 2 is referred to as the  $\alpha$ -carbon. Fatty acids found within the body occur as salts that are capable of forming micelles or are esterified to other compounds, such as the membrane lipids discussed in Chapter 8 of MCAT Biochemistry Review. When describing a fatty acid, the total number of carbons is given along with the number of double bonds, written as carbons:double bonds. Further description can be given by indicating the position and isomerism of the double bonds in an unsaturated fatty acid. Saturated fatty acids have no double bonds while unsaturated fatty acids have one or more double bonds. Humans can synthesize only a few of the unsaturated fatty acids; the rest come from essential fatty acids found in the diet that are transported in chylomicrons as triacylglycerols from the intestine. Two important essential fatty acids are  $\alpha$ -linolenic acid and linoleic acid. These polyunsaturated fatty acids, as well as other acids formed from them, are important in maintaining cell membrane fluidity, which is critical for proper functioning of the cell. The omega ( $\omega$ ) numbering system is also used for unsaturated fatty acids. The  $\omega$  designation describes the position of the last double bond relative to the end of the chain and identifies the major precursor fatty acid. For example, linoleic acid (18:2 cis,cis-9,12) is the precursor of the  $\omega$ -6 family, which includes arachidonic acid.  $\alpha$ -Linolenic acid (18:3 all-cis-9,12,15) is the

primary precursor of the  $\omega$ -3 family. Double bonds in natural fatty acids are generally in the cis configuration. Trans double bonds are uncommon in natural fatty acids; they predominate in fatty acids found in margarine and other foods that use partial hydrogenation of vegetable oils in their preparation. Compared with liquid oils, these partially hydrogenated fatty acids are solids at room temperature. These fatty acids contribute to arterial diseases and decreased fatty acids used by the body for fuel are supplied primarily by the diet. In addition, excess carbohydrate and protein acquired from the diet can be converted to fatty acids and stored as energy reserves in the form of triacylglycerols. Lipid and carbohydrate synthesis are often called nontemplate synthesis processes because they do not rely directly on the coding of a nucleic acid, unlike protein and nucleic acid synthesis.

### Fatty Acid Biosynthesis

Fatty acid biosynthesis, shown in Figure 11.5, occurs in the liver and its products are subsequently transported to adipose tissue for storage. Adipose tissue can also synthesize smaller quantities of fatty acids. Both of the major enzymes of fatty acid synthesis, acetyl-CoA carboxylase and fatty acid synthase, are also stimulated by insulin. Palmitic acid (palmitate) is the primary end product of fatty acid synthesis.

### Figure 11.5 Fatty Acid Synthesis from Glucose

Following a large meal, acetyl-CoA accumulates in the mitochondrial matrix and needs to be moved to the cytosol for fatty acid biosynthesis. Acetyl-CoA is the product of the pyruvate dehydrogenase complex, and it couples with oxaloacetate to form citrate at the beginning of the citric acid cycle. Remember that isocitrate dehydrogenase is the rate-limiting enzyme of citric acid cycle; as the cell becomes energetically satisfied, it slows the citric acid cycle, which causes citrate accumulation. Citrate can then diffuse across the mitochondrial membrane. In the cytosol, citrate lyase splits citrate back into acetyl-CoA and oxaloacetate. The oxaloacetate can then return to the mitochondrion to continue moving acetyl-CoA. Acetyl-CoA is activated in the cytoplasm for incorporation into fatty acids by acetyl-CoA carboxylase, the rate-limiting enzyme of fatty acid biosynthesis. Acetyl-CoA carboxylase requires biotin and ATP to function, and adds  $\text{CO}_2$  to acetyl-CoA to form malonyl-CoA. The enzyme is activated by insulin and citrate. The  $\text{CO}_2$  added to form malonyl-CoA is never actually incorporated into the fatty acid

because it is removed by fatty acid synthase during addition of the activated acetyl group to the fatty acid. Fatty Acid Synthase Fatty acid synthase is more appropriately called palmitate synthase because palmitate is the only fatty acid that humans can synthesize de novo. Fatty acid synthase is a large multienzyme complex found in the cytosol that is rapidly induced in the liver following a meal high in carbohydrates because of elevated insulin levels. The enzyme complex contains an acyl carrier protein (ACP) that requires pantothenic acid (vitamin B5). NADPH is also required to reduce the acetyl groups added to the fatty acid. Eight acetyl-CoA groups are required to produce palmitate (16:0). Fatty acyl-CoA may be elongated and desaturated, to a limited extent, using enzymes associated with the smooth endoplasmic reticulum (SER). The steps involved in fatty acid biosynthesis are shown in Figure 11.6 and include attachment to an acyl carrier protein, bond formation between activated malonyl-CoA (malonyl- ACP) and the growing chain, reduction of a carbonyl group, dehydration, and reduction of a double bond. These reactions occur over and over again until the sixteen-carbon palmitate molecule is created. Many of these reactions are reversed in  $\beta$ -oxidation. Figure 11.6 Action of Fatty Acid Synthase Reactions include activation of the growing chain (a) and malonyl-CoA (b) with ACP, bond formation between these activated molecules (c), reduction of a carbonyl to a hydroxyl group (d), dehydration (e), and reduction to a saturated fatty acid (f). Fatty acid synthesis and  $\beta$ -oxidation are reverse processes. Both involve transport across the mitochondrial membrane, followed by a series of redox reactions, but always in the opposite direction of one another. Understanding one process will enable you to answer questions about both pathways. Triacylglycerol (Triglyceride) Synthesis Triacylglycerols, the storage form of fatty acids, are formed by attaching three fatty acids (as fatty acyl-CoA) to glycerol. Triacylglycerol formation from fatty acids and glycerol 3-phosphate occurs primarily in the liver and somewhat in adipose tissue, with a small contribution directly from the diet, as well. In the liver, triacylglycerols are packaged and sent to adipose tissue as very-low-density lipoproteins (VLDL), leaving only a small amount of Most fatty acid catabolism proceeds via  $\beta$ -oxidation that occurs in the mitochondria; however, peroxisomal  $\beta$ -oxidation



also occurs. Branched-chain fatty acids may also undergo  $\alpha$ -oxidation, depending on the branch points, while  $\omega$ -oxidation in the endoplasmic reticulum produces dicarboxylic acids. You should be aware that these processes exist; however, the mechanisms are beyond the scope of the MCAT. We will take an in-depth look at  $\beta$ -oxidation, which will be much more heavily tested. Insulin indirectly inhibits  $\beta$ -oxidation while glucagon stimulates this process. When fatty acids are metabolized, they first become activated by attachment to CoA, which is catalyzed by fatty-acyl-CoA synthetase. The product is generically referred to as a fatty acyl-CoA or acyl-CoA. Specific examples would be acetyl-CoA containing a 2-carbon acyl group, or palmitoyl-CoA with a 16-carbon acyl group.

**Fatty Acid Entry into Mitochondria**

Short-chain fatty acids (2 to 4 carbons) and medium-chain fatty acids (6 to 12 carbons) diffuse freely into mitochondria, where they are oxidized. In contrast, while long-chain fatty acids (14 to 20 carbons) are also oxidized in the mitochondria, they require transport via a carnitine shuttle, as shown in Figure 11.7. Carnitine acyltransferase I is the rate-limiting enzyme of fatty acid oxidation. Very long chain fatty acids (over 20 carbons) are oxidized elsewhere in the cell.

**Figure 11.7 Fatty Acid Activation and Transport**

**$\beta$ -Oxidation in Mitochondria**

$\beta$ -Oxidation reverses the process of fatty acid synthesis by oxidizing and releasing (rather than reducing and linking) molecules of acetyl-CoA. The pathway is a repetition of four steps; each four-step cycle releases one acetyl-CoA and reduces  $\text{NAD}^+$  and FAD (producing NADH and  $\text{FADH}_2$ ). The  $\text{FADH}_2$  and NADH are oxidized in the electron transport chain, producing ATP. In muscle and adipose tissue, acetyl-CoA enters the citric acid cycle. In the liver, acetyl-CoA, which cannot be converted to glucose, stimulates gluconeogenesis by activating pyruvate carboxylase. In a fasting state, the liver produces more acetyl-CoA from  $\beta$ -oxidation than is used in the citric acid cycle. Much of the acetyl-CoA is used to synthesize ketone bodies (essentially two acetyl-CoA molecules linked together) that are released into the bloodstream and transported to other tissues. The four steps of  $\beta$ -oxidation, illustrated in Figure 11.8, are:

**Figure 11.8  $\beta$ -Oxidation**

1. Oxidation of the fatty acid to form a double bond
2. Hydration of the double bond to form a hydroxyl group
3. Oxidation of the hydroxyl group to form a carbonyl

( $\beta$ -ketoacid) 4. Splitting of the  $\beta$ -ketoacid into a shorter acyl-CoA and acetyl-CoA This process then continues until the chain has been shortened to two carbons, creating a final acetyl-CoA. Fatty acids with an odd number of carbon atoms undergo  $\beta$ -oxidation in the same manner as even-numbered carbon fatty acids for the most part. The only difference is observed during the final cycle, where even-numbered fatty acids for the most part yield two acetyl-CoA molecules (from the four- carbon remaining fragment) and odd-numbered fatty acids yield one acetyl- CoA and one propionyl-CoA (from the five-carbon remaining fragment), as shown in Figure 11.9. Propionyl-CoA is converted to methylmalonyl-CoA by propionyl-CoA carboxylase, which requires biotin (vitamin B7). Methylmalonyl-CoA is then converted into succinyl-CoA by methylmalonyl- CoA mutase, which requires cobalamin (vitamin B12). Succinyl-CoA is a citric acid cycle intermediate and can also be converted to malate to enter the gluconeogenic pathway in the cytosol. Odd-carbon fatty acids thus represent an exception to the rule that fatty acids cannot be converted to glucose in humans. Figure 11.9 The Propionic Acid Pathway Until now we've been discussing the oxidation of saturated fatty acids. In unsaturated fatty acids, two additional enzymes are necessary because double bonds can disturb the stereochemistry needed for oxidative enzymes to act on the fatty acid. To function, these enzymes can have at most one double bond in their active site; this bond must be located between carbons 2 and 3. Enoyl-CoA isomerase, shown in Figure 11.10, rearranges cis double bonds at the 3,4 position to trans double bonds at the 2,3 position once enough acetyl-CoA has been liberated to isolate the double bond within the first three carbons. In monounsaturated fatty acids this single step permits  $\beta$ -oxidation to proceed. Figure 11.10 Reaction of Enoyl-CoA Isomerase In polyunsaturated fatty acids, a further reduction is required using 2,4- dienoyl-CoA reductase to convert two conjugated double bonds to just one double bond at the 3,4 position, where it will then undergo the same rearrangement as monounsaturated fatty acids (as shown in Figure 11.11) to form a trans 2,3 double bond. Figure 11.11 Reaction of 2,4-Dienoyl-CoA Reductase Biochemistry Guided Example With Expert Thinking Propionic acidemia (PA) is a life-threatening disease caused by the deficiency of a

mitochondrial biotin-dependent enzyme known as propionyl coenzyme-A carboxylase (PCC). This enzyme is responsible for degrading the metabolic intermediate propionyl coenzyme-A (PP-CoA) to create methylmalonyl-CoA (MM-CoA). PP-CoA is commonly found as the end product to  $\beta$ -oxidation of fatty acid chains with an odd number of carbons. PP-CoA is also a metabolic intermediate arising from the normal turnover of several essential amino acids. The native PCC holoenzyme is composed of six  $\alpha$  (PCCA) and six  $\beta$  (PCCB) subunits. Both types of subunits must be functional for the enzyme to be operative. Deficiency in either or both PCC subunits and the consequent accumulation of PP-CoA leads to the pathogenesis of PA. Topic: PA is a disease caused by Lots of details here important PCC is to Detail about PCC structure: 6  $\alpha$  and 6  $\beta$ ; need both subunits to work Enzyme replacement therapy is an approach that aims to restore the activity of an enzyme in cases of deficiency or abnormal production. To overcome the challenge of delivery and targeting proteins to the mitochondria of living cells, two groups of peptide fusions called twin-arginine technique used in passage tries to restore activity of translocation (TAT) and mitochondrial targeting sequences (MTS) were employed. Purified constructs of subunit alone, TAT-MTS fusions with PCCA or PCCB, or TAT fusions with PCCA or PCCB were incubated for various time periods with PCCA- and PCCB-defective whole cell lymphocytes. The lymphocytes endogenously express the non-defective PCC subunit. Mitochondria were subsequently isolated, lysed, and the reactions were terminated by the addition of trichloroacetic acid. Levels of MM-CoA were assayed using ultra performance liquid chromatography tandem mass spectrometry (UPLC-MS/MS). Normal and PCCA- or PCCB- deficient (def) cells were included as controls. The results are plotted in Figures 1 and 2 below. Issue: difficult to produced proteins to Solution: CPP and MTS are fused to protein of interest to get them into of PCC subunit and Assayed levels of MM-CoA as a measure of PCC IVs: time assayed, type of construct DV: levels of MM-CoA difference in MM-CoA levels 24 hours after added compared to absence of PCCA IVs: time assayed, type of construct DV: levels of MM-CoA difference in MM-CoA levels 12 and 24 hours after PCCB- compared to absence Adapted from Darvish-Damavandi, M., Ho, H.K., & Kang, T.S. (2016) Towards the

development of an enzyme replacement therapy for the metabolic disorder propionic acidemia. According to the data, are MTS-TAT-PCC constructs able to successfully rescue PCC activity in deficient mitochondria? This question begins with “according to the data”, meaning it will require us to understand and analyze the data presented in the context of the experiment described in the passage. Given we have multiple, complex figures, it’s important to get some context on the experiments and what the data represent first. The researchers are exploring treatment options for a disease caused by deficient PCC, which is an important metabolic enzyme in the mitochondria. We’re told that PCC requires both types of subunits in order to function properly. Common methods of restoring protein activity in cells are at the transcriptional/translational level within the cell, but the method employed in this study produces the required protein outside of the cell, then adds the protein back into the cell. We should know from our content background that proteins are generally polar, so the challenge is getting the protein past the lipid bilayers of both the cellular and the mitochondrial membranes. The researcher’s solution to this problem is to fuse PCC subunits to peptides that not only get PCC through the membranes, but also target the mitochondria. Also, note that the cell lines still express the non-deficient subunit: the cell lines in Figure 1 still express functional PCCB, so PCCA must be added and delivered to the mitochondria for there to be PCC activity; the opposite is true for the cell lines in Figure 2. Diving into the data, the experimental layout and the results are similar for both PCCA and PCCB fusions. When the PCC-subunit is fused to TAT alone, or in the absence of fusion, the levels of MM-CoA are similar. However, when the PCC-subunit is fused to both MTS and TAT, we see significantly higher levels of MM-CoA. The first paragraph tells us that PCC will catalyze PP-CoA to produce MM-CoA, the product being measured in the experiment, so high levels of MM-CoA correlate to PCC activity. Therefore, these results indicate that PCC activity can be rescued by exogenously expressing PCC-subunits and fusing them to both mitochondrial-targeting and cell-permeating proteins. MCAT CONCEPT CHECK 11.5 Before you move on, assess your understanding of the material with these questions. 1. Draw the following fatty acids: palmitic

acid, 18:3 (all-cis-9,12,15), an  $\omega$ -6. 2. What are the five steps in the addition of acetyl-CoA to a growing fatty acid chain? 3. How does  $\beta$ -oxidation of unsaturated fatty acids differ from that of saturated fatty acids? 4. True or False: Fatty acids are synthesized in the cytoplasm and modified by enzymes in the smooth endoplasmic reticulum.

### 11.6 Ketone Bodies

After Chapter 11.6, you will be able to: Predict when fatty acids would be used to create ketone bodies rather than glucose. Recall the conditions that favor ketogenesis and ketolysis. Ketone bodies are essentially transportable forms of acetyl-CoA. They are produced by the liver and used by other tissues during prolonged starvation. In the fasting state, the liver converts excess acetyl-CoA from  $\beta$ -oxidation of fatty acids into the ketone bodies acetoacetate and 3-hydroxybutyrate ( $\beta$ -hydroxybutyrate), which can be used for energy in various tissues. Cardiac and skeletal muscle and the renal cortex can metabolize acetoacetate and 3-hydroxybutyrate to acetyl-CoA. During fasting periods, muscle will metabolize ketones as rapidly as the liver releases them, preventing accumulation in the bloodstream. After a week of fasting, ketones reach a concentration in the blood that is high enough for the brain to begin metabolizing them. The processes of ketogenesis and ketolysis are shown in Figure 11.12.

### Ketogenesis and Ketolysis

A significant increase in ketone levels in the blood can lead to ketoacidosis, a potentially dangerous medical condition. This occurs most often with fatty acid breakdown in type 1 (insulin-dependent) diabetes mellitus. Ketogenesis occurs in the mitochondria of liver cells when excess acetyl-CoA accumulates in the fasting state. HMG-CoA synthase forms HMG-CoA, and HMG-CoA lyase breaks down HMG-CoA into acetoacetate, which can subsequently be reduced to 3-hydroxybutyrate. Acetone is a minor side product that is formed but will not be used as energy for tissues. Acetoacetate picked up from the blood is activated in the mitochondria by succinyl-CoA acetoacetyl-CoA transferase (commonly called thiophorase), an enzyme present only in tissues outside the liver. During this reaction, acetoacetate is oxidized to acetoacetyl-CoA. The liver lacks this enzyme, so it cannot catabolize the ketone bodies that it produces.

### Ketolysis in the Brain

During a prolonged fast (longer than one week), the brain begins to derive up to two-thirds of its energy from ketone bodies. In the

brain, when ketones are metabolized to acetyl-CoA, pyruvate dehydrogenase is inhibited. Glycolysis and glucose uptake in the brain decreases. This important switch spares essential protein in the body, which otherwise would be catabolized to form glucose by gluconeogenesis in the liver, and allows the brain to indirectly metabolize fatty acids as ketone bodies. MCAT CONCEPT CHECK 11.6 Before you move on, assess your understanding of the material with these questions. 1. Why are fatty acids used to create ketone bodies instead of creating glucose? 2. What conditions and tissues favor ketogenesis? Ketolysis? 11.7 Protein Catabolism After Chapter 11.7, you will be able to: Identify common sources for acetyl-CoA used in lipid synthesis Recall the location(s) associated with large amounts of protein digestion Predict what will happen to the carbon skeleton, amino groups, and side chains of proteins that have been broken down Protein is very rarely used as an energy source because it is so important for other functions; routinely breaking down protein would result in serious illness. However, under conditions of extreme energy deprivation, proteins can be used for energy. In order to provide a reservoir of amino acids for protein building by the cell, proteins must be digested and absorbed. Metabolism is directed toward conserving tissues to the greatest extent possible, especially the brain and heart. Digestion of protein compromises muscle—potentially that of the heart—so it is unlikely to occur under normal conditions. Proteolysis (the breakdown of proteins) begins in the stomach with pepsin and continues with the pancreatic proteases trypsin, chymotrypsin, and carboxypeptidases A and B, all of which are secreted as zymogens. Protein digestion is completed by the small intestinal brush-border enzymes dipeptidase and aminopeptidase. The main end products of protein digestion are amino acids, dipeptides, and tripeptides. Absorption of amino acids and small peptides through the luminal membrane is accomplished by secondary active transport linked to sodium. At the basal membrane, simple and facilitated diffusion transports amino acids into the bloodstream. Figure 11.13 illustrates the major transport mechanisms involved in moving amino acids across the luminal and basal membranes of intestinal cells. Figure 11.13 Absorption of Amino Acids and Peptides in the Intestine Protein obtained from the diet or

from the body (during prolonged fasting or starvation) may be used as an energy source. Body protein is catabolized primarily in muscle and liver. Amino acids released from proteins usually lose their amino group through transamination or deamination. The remaining carbon skeleton can be used for energy. Amino acids are classified by their ability to turn into specific metabolic intermediates: glucogenic amino acids (all but leucine and lysine) can be converted into glucose through gluconeogenesis; ketogenic amino acids (leucine and lysine, as well as isoleucine, phenylalanine, threonine, tryptophan, and tyrosine, which are also glucogenic as well) can be converted into acetyl- CoA and ketone bodies. The amino groups removed by transamination or deamination constitute a potential toxin to the body in the form of ammonia, and must be excreted safely. The urea cycle, shown in Figure 11.14, occurs in the liver and is the body's primary way of removing excess nitrogen from the body. The MCAT is highly unlikely to test on the steps and intermediates of the urea cycle directly, but it is provided here as a point of reference. Figure 11.14 The Urea Cycle

The fate of the side chain from each amino acid depends on its chemistry. Basic amino acid side chains feed into the urea cycle, while the other side chains act like the carbon skeleton and produce energy through gluconeogenesis or ketone production.

**MCAT CONCEPT CHECK 11.7** Before you move on, assess your understanding of the material with these questions.

1. True or False: Bodily proteins will commonly be broken down to provide acetyl-CoA for lipid synthesis.
2. Where does the bulk of protein digestion occur?
3. During protein processing, what is the eventual fate of each of the following components: carbon skeleton, amino group, and side chains?

At this point, we have examined all of the vital metabolic processes of the cell. In this chapter, we reviewed dietary lipids and different ways that lipids are metabolized in the cell. We also covered lipid transport in blood and lymphatic fluid and the mobilization of lipids from adipocytes. In addition, we went over the structure, synthesis, and breakdown of fatty acids required to address the energy needs of the cell. The importance of ketone bodies and how they are utilized by the cell during periods of starvation were also reviewed. Finally, we went over digestion and metabolism of proteins and Metabolism of the different macromolecules

does not occur in isolation, as you've already seen: the acetyl-CoA produced in fatty acid oxidation regulates the pyruvate dehydrogenase complex and pyruvate carboxylase to create a shift in carbohydrate metabolism from glycolysis and the citric acid cycle to gluconeogenesis. In the next chapter, we'll dive into how the different pathways fit together and will integrate the metabolic knowledge that you've compiled in Chapters 9, 10, and 11 of MCAT Biochemistry. You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources!

### Lipid Digestion and Absorption

Mechanical digestion of lipids occurs primarily in the mouth and Chemical digestion of lipids occurs in the small intestine and is facilitated by bile, pancreatic lipase, colipase, and cholesterol. Digested lipids may form micelles for absorption or be absorbed. Short-chain fatty acids are absorbed across the intestine into the Long-chain fatty acids are absorbed as micelles and assembled into chylomicrons for release into the lymphatic system. Lipids are mobilized from adipocytes by hormone-sensitive lipase. Lipids are mobilized from lipoproteins by lipoprotein lipase. Chylomicrons are the transport mechanism for dietary triacylglycerol molecules and are transported via the lymphatic system. VLDL transports newly synthesized triacylglycerol molecules from the liver to peripheral tissues in the bloodstream. IDL is a VLDL remnant in transition between triacylglycerol and cholesterol transport; it picks up cholesteryl esters from HDL. LDL primarily transports cholesterol for use by tissues. HDL is involved in the reverse transport of cholesterol. Apoproteins control interactions between lipoproteins. Cholesterol may be obtained through dietary sources or through de novo synthesis in the liver. The key enzyme in cholesterol biosynthesis is HMG-CoA reductase. LCAT catalyzes the formation of cholesteryl esters for transport with CETP catalyzes the transition of IDL to LDL by transferring cholesteryl esters from HDL.

### Fatty Acids and Triacylglycerols

Fatty acids are carboxylic acids, typically with a single long chain, although they can be branched. Saturated fatty acids have no double bonds between carbons. Unsaturated fatty acids have one or more double bonds. Fatty acids are synthesized in the cytoplasm from acetyl-CoA transported out of the mitochondria. Synthesis includes five steps: activation, bond formation,



reduction, dehydration, and a second reduction. These steps are repeated eight times to form palmitic acid, the only fatty acid that humans can synthesize. Fatty acid oxidation occurs in the mitochondria following transport by the carnitine shuttle.  $\beta$ -Oxidation uses cycles of oxidation, hydration, oxidation, and Branches and unsaturated fatty acids require special enzymes. Unsaturated fatty acids use an isomerase and an additional reductase during cleavage. Ketone bodies form (ketogenesis) during a prolonged starvation state due to excess acetyl-CoA in the liver. Ketolysis regenerates acetyl-CoA for use as an energy source in The brain can derive up to two-thirds of its energy from ketone bodies during prolonged starvation. Protein digestion occurs primarily in the small intestine. Catabolism of cellular proteins occurs only under conditions of Carbon skeletons of amino acids are used for energy, either through gluconeogenesis or ketone body formation. Amino groups are fed into the urea cycle for excretion. The fate of a side chain depends on its

Answers to Concept Checks 1. Physical digestion is accomplished in the mouth and the stomach, reducing the particle size. Beginning in the small intestine, pancreatic lipase, colipase, cholesterol esterase, and bile assist in the chemical digestion of lipids. In the more distal portion of the small intestine, 2. False. Small free fatty acids enter the circulation directly. 3. Micelles are collections of lipids with their hydrophobic ends oriented toward the center and their charged ends oriented toward the aqueous environment. Micelles collect lipids within their hydrophobic centers. 1. An increase in insulin levels will increase lipid storage and decrease lipid mobilization from adipocytes, leading to weight gain in patients who have diabetes and begin insulin injections. 2. The ratio of free fatty acids to glycerol is 3:1. A triacylglycerol molecule is composed of glycerol and three fatty acids. 1. Free fatty acids remain in the blood, bonded to albumin and other carrier proteins. A much smaller amount will remain unbonded. 2. With respect to protein content, HDL > LDL > IDL > VLDL > chylomicrons. VLDL and chylomicrons are the primary triacylglycerol transporters. HDL and LDL are mostly involved in cholesterol 3. Lipoproteins are synthesized primarily by the intestine and liver. 4. As mentioned in the chapter, HDL is often considered "good" cholesterol because it picks up excess cholesterol

from blood vessels for excretion. Because of this crucial role, HDL values are checked for being over a minimum value.

1. HMG-CoA reductase is most active in the absence of cholesterol and when stimulated by insulin. Cholesterol reduces the activity of HMG-CoA reductase, which is located in the smooth endoplasmic reticulum.
2. LCAT catalyzes the esterification of cholesterol to form cholesteryl esters. CETP promotes the transfer of cholesteryl esters from HDL to IDL, forming LDL.

1. Palmitic acid (16:0): Note: As long as the last double bond is in the same position relative to the end of the chain, many answers are possible for the  $\omega$ -6 fatty acid.

2. The steps in the attachment of acetyl-CoA to a fatty acid chain are attachment to acyl carrier protein, bond formation between molecules, reduction of a carbonyl group, dehydration, and reduction of a double bond. These steps are shown in Figure 11.6.

3. There is an additional isomerase and an additional reductase for the  $\beta$ -oxidation of unsaturated fatty acids, which provide the stereochemistry necessary for further oxidation.

1. Fatty acid degradation results in large amounts of acetyl-CoA, which cannot enter the gluconeogenic pathway to produce glucose. Only odd-numbered fatty acids can act as a source of carbon for gluconeogenesis; even then, only the final malonyl-CoA molecule can be used. Energy is packaged into ketone bodies for consumption by the brain and muscles.

2. Ketogenesis is favored by a prolonged fast and occurs in the liver. It is stimulated by increasing concentrations of acetyl-CoA. Ketolysis is also favored during a prolonged fast, but is stimulated by a low-energy state in muscle and brain tissues and does not occur in the liver.

1. False. Proteins are more valuable to the cell than lipids, thus they will not commonly be broken down for lipid synthesis.

2. The bulk of protein digestion occurs in the small intestine.

3. The carbon skeleton is transported to the liver for processing into glucose or ketone bodies. The amino group will feed into the urea cycle for excretion. Side chains are processed depending on their composition. Basic side chains will be processed like amino groups, while other functional groups will be treated like the carbon skeleton.

Science Mastery Assessment

This question asks for the hormone that does not directly regulate the activity of hormone-sensitive lipase (HSL). Hormone sensitive lipase is an enzyme that cleaves fatty acids

from their glycerol backbones, releasing these free fatty acids for use in energy production. HSL is directly activated by epinephrine and cortisol, so (C) and (D) can be eliminated. Regarding insulin vs. glucagon, observe that free fatty acid mobilization, and therefore HSL activity, is generally associated with low blood sugar, which is also associated with elevated glucagon levels. However, glucagon does not directly regulate the activity of HSL. Rather, HSL is activated by a drop in insulin levels. For this reason, insulin does directly regulate HSL activity, and therefore (A) can be eliminated. Only glucagon, (B), does not directly influence HSL activity. Therefore (B) is the correct answer. Short-chain fatty acids are soluble in the intestinal lumen, and thus do not interact with micelles as longer fatty acid chains do. The long-chain fatty acids are taken up by the intestinal cells and packaged into triacylglycerols for transport as chylomicrons. Chylomicrons exit the intestine through lacteals that feed into the lymphatic system, which joins with the bloodstream in the base of the neck through the thoracic duct. During fatty acid mobilization, there is a breakdown of triacylglycerols in adipocytes by hormone-sensitive lipase (HSL). This breakdown results in the release of three fatty acids and a glycerol molecule. The glycerol may be used by the liver for gluconeogenesis, but adipocytes do not have the ability to carry out gluconeogenesis. Chylomicrons and VLDL are very similar. Both contain apolipoproteins and primarily transport triacylglycerols, eliminating (A) and (C). The only major difference between them is the tissue of origin. Chylomicrons transport dietary triacylglycerol and originate in the small intestine, while VLDL transport newly synthesized triacylglycerols and originate in the liver. While the transport and lipid binding functions of most lipoproteins are independent of the apolipoprotein component, the interaction of these lipoproteins with the environment is controlled almost exclusively by apolipoproteins. Lipoproteins cannot exit or enter cells without apolipoproteins, and are unable to transfer lipids without specialized apolipoproteins or cholesterol-specific enzymes. Statins are drugs that are prescribed to treat high cholesterol and act as competitive inhibitors of HMG-CoA reductase. HMG-CoA reductase is the rate-limiting enzyme of de novo cholesterol synthesis; inhibition of this enzyme lowers production of cholesterol, thus lowering

overall levels of LCAT adds a fatty acid to cholesterol, producing cholesteryl esters, which dissolve in the core of HDL, allowing HDL to transport cholesterol from the periphery to the liver. Humans can only synthesize one fatty acid, palmitic acid. Palmitic acid is fully saturated and therefore does not contain any double bonds. Palmitic acid has 16 carbons, and is synthesized from eight molecules of acetyl-CoA. In shorthand notation, palmitic acid is written as 16:0 (16 carbons, no double bonds). The steps in fatty acid synthesis are activation (attachment to acyl carrier protein), bond formation (between malonyl-CoA and the growing fatty acid chain), reduction (of a carboxyl group), dehydration, and reduction (of a ketone group). Ketone bodies are produced in the mitochondria of liver cells as acetyl-CoA accumulates during fasting, consistent with (C). On the other hand, to eliminate (B), observe that while acetyl-CoA is indeed converted to acetoacetate, 3-hydroxybutyrate, or acetone, the acetone that is produced is only a byproduct and is not used for energy, which conflicts with the assertion in (B) that "all of which are used for energy." Muscle cells will begin using ketone bodies for energy before the brain. The brain will only start using ketone bodies once they have accumulated to higher concentrations in the blood, eliminating choice (D). The liver is the major metabolic organ in the body and is responsible for much of the synthesis and interconversion of fuel sources. Most of the triacylglycerols that are synthesized in the liver are transported as VLDL to adipose tissue for storage. Both the adipocytes, (A), and dietary intake, (B), constitute a minor source of triacylglycerols. In order for the enzymes of fatty acid oxidation to operate, there can be, at most, one double bond in the area of enzyme activity, and it must be oriented between carbons 2 and 3. In order to accomplish this in monounsaturated fatty acids, an isomerase is employed. When there are multiple double bonds that fall within the enzymatic binding site, both an isomerase and 2,4-dienoyl-CoA reductase are required for the oxidative enzymes to act on the fatty acid. For this question, simply recognizing that dienoyl refers to having multiple double bonds is sufficient to arrive at the correct answer. Ketolysis is the breakdown of ketone bodies to acetyl-CoA for energy. This process occurs in the brain and muscle tissues, but cannot occur in the liver, which lacks an enzyme necessary for ketone body breakdown. Ketolysis is not

associated with an increase in glucose metabolism because it most often occurs under conditions of starvation. The energy contribution of an amino acid depends on its ability to be turned into glucose through gluconeogenesis (glucogenic amino acids), ketone bodies (ketogenic amino acids), or both. All of the amino acids listed in the answer choices are glucogenic; isoleucine is also ketogenic. The energy acquired from an amino acid will also depend on the number of carbons it can donate to these energy-creating processes, which depends on the size of its side chain. Isoleucine has the largest side chain of the answer choices, and will thus contribute the most energy per molecule. The degradation of protein and processing by the liver implies a prolonged starvation state; protein will not be used for energy unless absolutely necessary. Thus, gluconeogenesis is the most likely process. When gluconeogenesis is not possible, easily metabolized molecules, such as ketone bodies, are synthesized. Fatty acid production occurs when energy is being stored; proteins would not be broken down to store energy in fatty acids. Consult your online resources for additional practice.

Biochemistry Chapter 1 Amino Acids, Peptides, and Proteins Biochemistry Chapter 5 Lipid Structure and Function Biochemistry Chapter 8 Biochemistry Chapter 12 Bioenergetics and Regulation of Metabolism Biology Chapter 9 The Digestive System Biology Chapter 10 Bioenergetics and Regulation

Every pre-med knows this feeling: there is so much content I have to know for the MCAT! How do I know what to do first or what's important? While the high-yield badges throughout this book will help you identify the most important topics, this Science Mastery Assessment is another tool in your MCAT prep arsenal. This quiz (which can also be taken in your online resources) and the guidance below will help ensure that you are spending the appropriate amount of time on this chapter based on your personal strengths and weaknesses. Don't worry though—skipping something now does not mean you'll never study it. Later on in your prep, as you complete full-length tests, you'll uncover specific pieces of content that you need to review and can come back to these chapters as appropriate.

**How to Use This Assessment** If you answer 0–7 questions correctly: Spend about 1 hour to read this chapter in full and take limited notes throughout. Follow up by reviewing all quiz questions to

ensure that you now understand how to solve each one. If you answer 8–11 questions correctly: Spend 20–40 minutes reviewing the quiz questions. Beginning with the questions you missed, read and take notes on the corresponding subchapters. For questions you answered correctly, ensure your thinking matches that of the explanation and you understand why each choice was correct or incorrect. If you answer 12–15 questions correctly: Spend less than 20 minutes reviewing all questions from the quiz. If you missed any, then include a quick read-through of the corresponding subchapters, or even just the relevant content within a subchapter, as part of your question review. For questions you got correct, ensure your thinking matches that of the explanation and review the Concept Summary at the end of the chapter.

1. Adding heat to a closed biological system will do all of the following:

- increase the internal energy of the system.
- increase the average of the vibrational, rotational, and translational kinetic energies of the molecules.
- cause the system to do work to maintain a fixed internal energy.
- increase the enthalpy of the system.

2. At 25°C the  $\Delta G^\circ$  for a certain reaction  $A \rightarrow B + 2 C$  is 0. If the concentration of A, B, and C in the cell at 25°C are all 10 mM, how does the  $\Delta G$  compare to the measurement taken with 1 M A?

- $\Delta G$  is greater than  $\Delta G^\circ$ , thus the reaction is spontaneous.
- $\Delta G$  is less than  $\Delta G^\circ$ , thus the reaction is spontaneous.
- $\Delta G$  is greater than  $\Delta G^\circ$ , thus the reaction is nonspontaneous.
- $\Delta G$  is less than  $\Delta G^\circ$ , thus the reaction is nonspontaneous.

3. Which of the following statements is true about the hydrolysis of ATP?

- The free energy of ATP hydrolysis is independent of pH.
- One mole of creatine phosphate can phosphorylate two moles of ADP.
- The free energy of hydrolysis of ATP is nearly the same as for the hydrolysis of GTP.
- ATP yields cyclic AMP after two hydrolysis reactions.

4. The reduction half-reaction in the last step of the electron transport chain is:

- $O_2 + 4e^- + 4 H^+ \rightarrow 2 H_2O$
- $NADPH \rightarrow NADP^+ + e^- + H^+$
- $NADP^+ + e^- + H^+ \rightarrow NADPH$
- Ubiquinone (Q)  $\rightarrow$  Ubiquinol (QH<sub>2</sub>)

5. The ability to exist in both an oxidized and a reduced state is characteristic of:

- adenosine triphosphate (ATP).
- electron carriers.
- regulatory enzymes.
- peptide hormones.

6. What energy state was described in the introduction to this chapter?

7. Which of the following correctly pairs a tissue with its preferred energy source in the well fed state?

- Liver - ketone bodies
- Adipose tissue - fatty acids
- Brain - amino acids
- Cardiac muscle - fatty acids

8. How do hormonal controls regulate energy metabolism?

of glycogen metabolism differ from A. Hormonal control is systemic and covalent. B. Hormonal control is local and covalent. C. Hormonal control is systemic and noncovalent. D. Hormonal control is local and noncovalent. 9. Which of the following tissues is most dependent on insulin? A. Active skeletal muscle B. Resting skeletal muscle C. Cardiac muscle D. Smooth muscle 10. Glucocorticoids have been implicated in stress-related weight A. they increase appetite and decrease satiety signals. B. they increase the activity of catabolic hormones. C. they increase glucose levels, which causes insulin secretion. D. they interfere with activity of the leptin receptor. 11. In the absence of oxygen, which tissue will experience damage C. Red blood cells 12. A respiratory quotient approaching 0.7 indicates metabolism primarily of which macromolecule? C. Nucleic acids D. Amino acids 13. Which of the following side effects would be anticipated in someone taking leptin to promote weight loss? B. Increased appetite 14. Which of the following statements is FALSE? A. Growth hormone participates in glucose counterregulation. B. T4 acts more slowly than T3. C. ATP stores are turned over more than 10,000 times daily. D. Catecholamines stimulate the sympathetic nervous system. 15. Which process is expected to begin earliest in a prolonged fast? A. Ketone bodies are used by the brain. B. Glycogen storage is halted. C. Proteins are broken down. D. Enzyme phosphorylation and dephosphorylation.

Bioenergetics and Regulation of In This Chapter

12.1 Thermodynamics and Bioenergetics Enthalpy, Entropy, and Free Energy 12.2 The Role of ATP ATP as an Energy Carrier Hydrolysis and Coupling Phosphoryl Group Transfers 12.3 Biological Oxidation and Reduction 12.4 Metabolic States Postprandial (Absorptive) State Postabsorptive (Fasting) State Prolonged Fasting (Starvation) 12.5 Hormonal Regulation of Metabolism Insulin and Glucagon 12.6 Tissue-Specific Metabolism 12.7 Integrative Metabolism Analysis of Metabolism Regulation of Body Mass

The content in this chapter should be relevant to about 9% of all questions about biochemistry on the MCAT. This chapter covers material from the following AAMC content categories: 1D: Principles of bioenergetics and fuel molecule metabolism 5E: Principles of chemical thermodynamics and kinetics

You got up this morning with a really ambitious plan: study for the MCAT! The day started with a big

breakfast, and then you dove into MCAT Biochemistry Review. A few chapters in you noticed your stomach growling, but you were having so much fun that you ignored it. A little while later, your body realized it wasn't getting any more food for a while, but it still needed energy. Where does it come from? The human body is an incredible system. When we skip lunch on a study day, we produce hormones that help raise the level of certain energy molecules in the bloodstream, mainly glucose. This is a good thing because the brain relies solely on glucose for most of its metabolism, and we always want to be thinking at our peak. Glucose in the blood comes from either our diet, such as when we eat a big breakfast, or from our fuel stores, through the processes of gluconeogenesis and glycogenolysis. These processes, just like the formation and consumption of ATP, are highly regulated. In this chapter, we'll highlight the basic principles of bioenergetics, including thermodynamics: the sources of energy and the reactions that play a key role in moving that energy around. Then we'll examine the different energy states of the body before taking a look at the intimate relationship of hormones with metabolism. We'll spend some time examining the regulation of metabolism, regulatory enzymes for some common pathways, and how specific tissues preferentially metabolize particular macronutrients. By the end of this chapter, you'll be able to tell where and how your food is being used, and you probably won't choose to skip lunch again—no matter how much fun you're having!

### 12.1 Thermodynamics and Bioenergetics

After Chapter 12.1, you will be able to:

- Describe the relationship between  $\Delta G^\circ$  and  $\Delta G^\circ'$
- Explain why heat can be used as a measure of internal energy for biological
- Predict the spontaneity of a reaction given the signs of  $\Delta H$  and  $\Delta S$

The energy of chemical reactions is described as part of general chemistry, while work is generally associated with physics. Be aware that on Test Day, you will see crossover that allows you to draw on knowledge of the other subjects and to use that background information to your advantage. If we take a look back at what we learned about thermodynamics in Chapter 3 of MCAT Physics and Math Review and Chapter 7 of MCAT General Chemistry Review, it becomes evident that we already know quite a bit. However, most of the data that we've seen so far has been obtained under standard-state conditions



(25°C, 1 atm pressure, and 1 M concentrations). These assumptions work in a chemistry lab, but must be adjusted for application in the human body. Biological systems are often considered open systems because they can exchange both energy and matter with the environment. Energy is exchanged in the form of mechanical work when something is moved over a distance, or as heat energy. Matter is exchanged through food consumption and elimination, as well as respiration. Most biochemical studies are performed on the cellular or subcellular level rather than in an entire organism. These systems can be considered closed because there is no exchange of matter with the environment. In such a system, we can make useful simplifications about the internal energy,  $U$ . Internal energy is the sum of all of the different interactions between and within atoms in a system; vibration, rotation, linear motion, and stored chemical energies all. Because the system is closed, the change in internal energy can come only in the form of work or heat. This can be represented mathematically through the First Law of Thermodynamics,  $\Delta U = Q - W$ . Work in thermodynamics refers to changes in pressure and volume. These are constant in most living systems, so the only quantity of interest in determining internal energy is Enthalpy, Entropy, and Free Energy. Bioenergetics is the term used to describe energy states in biological systems. Changes in free energy ( $\Delta G$ ) provide information about chemical reactions and can predict whether a chemical reaction is favorable and will occur. In biological systems, ATP plays a crucial role in transferring energy from energy-releasing catabolic processes to energy-requiring anabolic. Whether a chemical reaction proceeds is determined by the degree to which enthalpy and entropy change during a chemical reaction. Enthalpy measures the overall change in heat of a system during a reaction. At constant pressure and volume, enthalpy ( $\Delta H$ ) and thermodynamic heat exchange ( $Q$ ) are equal. Changes in entropy ( $\Delta S$ ) measure the degree of disorder or energy dispersion in a system. While the MCAT will not test on the level of statistical thermodynamics, this conceptual understanding of entropy ( $\Delta S$ ) will be helpful. Entropy carries the units J/K. When combined together mathematically, along with temperature ( $T$ ), these quantities can be related through the Gibbs free energy equation:  $\Delta G = \Delta H - T\Delta S$  which predicts the direction in

which a chemical reaction proceeds spontaneously. Spontaneous reactions proceed in the forward direction, exhibit a net loss of free energy, and therefore have a negative  $\Delta G$ . In contrast, nonspontaneous reactions, which would be spontaneous in the reverse direction, exhibit a net gain of energy and have a positive  $\Delta G$ . Free energy approaches zero as the reaction proceeds to equilibrium and there is no net change in concentration of reactants or products. Enthalpy, entropy, and free energy are discussed more thoroughly in Chapter 7 of MCAT General Chemistry Review. The change in free energy ( $\Delta G$ ) that we have been discussing up to this point predicts changes occurring at any concentration of products and reactants and at any temperature. In contrast, standard free energy ( $\Delta G^\circ$ ) is the energy change that occurs at standard concentrations of 1 M, pressure of 1 atm, and temperature of 25°C. These can be related by the equation:  $\Delta G = \Delta G^\circ + RT \ln(Q)$  where  $R$  is the universal gas constant,  $T$  is the temperature, and  $Q$  is the reaction quotient. Biochemical analysis works well under all standard conditions except one: pH. A 1 M concentration of protons would correspond to a pH of 0, which is far too acidic for most biochemical reactions. Therefore, in the modified standard state,  $[H^+] = 10^{-7}$  M and the pH is 7. With this additional condition,  $\Delta G^\circ$  is given the special symbol  $\Delta G^{\circ'}$ , indicating that it is standardized to the neutral buffers used in biochemistry. Note that if the concentrations of other reactants and products differ from 1 M, these must still be adjusted for in the equation above. The shift in  $\Delta G$  as a result of changing concentration is not universally toward or away from spontaneity. There is a general trend that reactions with more products than reactants have a more negative  $\Delta G$ , while reactions with more reactants than products have a more positive  $\Delta G$ . While this trend is useful for making quick assessments, always double check with numbers on Test Day.

**MCAT CONCEPT CHECK 12.1** Before you move on, assess your understanding of the material with these questions.

1. What conditions does  $\Delta G^{\circ'}$  adjust for that are not considered with  $\Delta G^\circ$ ?
2. Why can heat be used as a measure of internal energy in living systems?
3. Complete the following table relating the change in entropy and enthalpy of a reaction with whether the reaction is spontaneous.

**12.2 The Role of ATP** After Chapter 12.2, you will be able to: Predict the impact of

ATP coupling on the energetics of a reaction Calculate free energy change for an overall reaction given energetic data for Relate the structure of ATP to its role as an energy carrier

The human body can make use of different energy sources with roughly the same efficiency, but all nutrient molecules are not created equally. For example, fats are much more energy-rich than carbohydrates, proteins, or ketones. Complete combustion of fat results in 9 kcal of energy, compared with only 4 kcal derived from carbohydrates, proteins, or ketones. Because fats are so much more energy-dense than other biomolecules, they are preferred for long-term energy storage. Think of the difference between fats and carbohydrates like the difference between a 16-GB and an 8-GB storage drive. The storage drive with a greater capacity occupies the same amount of physical space, but holds twice as much data. While different energy sources provide greater or lesser caloric values, the end goal is to have energy in a readily available form. For the cell, this is adenosine triphosphate (ATP), shown in Figure 12.1.

**Figure 12.1 Adenosine Triphosphate (ATP)** ATP as an Energy Carrier ATP is the major energy currency in the body. It is a mid-level energy carrier, as seen in Table 12.1, and is formed from substrate-level phosphorylation, as well as oxidative phosphorylation. Why do we want ATP to be a mid-level carrier and not a higher-level one? Think about your wallet. If you never had the ability to get change back after a purchase, what type of bill would you want in abundance? One dollar bills! Similarly, ATP cannot get back the “leftover” free energy after a reaction, so it’s best to use a carrier with a smaller free energy. ATP provides about 30 kJ under physiological conditions. If a reaction only requires 10 kJ overcome a positive  $\Delta G$  value, then 20 kJ have been wasted. The waste would be even higher with a higher-energy compound like creatine

**Table 12.1 Free Energy of Hydrolysis for Key Metabolic Phosphate Compounds**

Direct phosphorylation in muscle Energy turnover in all cell types Intermediate of glycolysis and gluconeogenesis Remember that most of the ATP in a cell is produced by mitochondrial ATP synthase, as described in Chapter 10 of MCAT Biochemistry Review, but some ATP is produced during glycolysis and (indirectly from GTP) in the citric acid cycle. ATP consists of an adenosine molecule attached to three phosphate groups, and is generated from ADP and  $P_i$  with energy

input from an exergonic reaction or electrochemical gradient. ATP is consumed either through hydrolysis or the transfer of a phosphate group to another molecule. If one phosphate group is removed, adenosine diphosphate (ADP) is produced; if two phosphate groups are removed, adenosine monophosphate (AMP) is the result. In a single day, an average-sized person uses about 90 percent of body weight in ATP but only has about 50 grams of ATP available at any given time. Continuous recycling of ATP, ADP, and  $P_i$  more than 1000 times per day accounts for this discrepancy. ATP is used to fuel energetically unfavorable reactions or to activate or inactivate other What makes ATP such a good energy carrier is its high-energy phosphate bonds. The negative charges on the phosphate groups experience repulsive forces with one another, and the ADP and  $P_i$  molecules that form after hydrolysis are stabilized by resonance. While ATP doesn't rapidly break down on its own in the cell, it is much more stable after hydrolysis. This accounts for the very negative value of  $\Delta G$ . Under standard conditions  $\Delta G^\circ$  is about 55 kJ . At pH 7 and with excess magnesium, the standard free energy change is still 30.5 kJ . ADP, which also displays charge repulsion and resonance stabilization after hydrolysis, has similar  $\Delta G$  values, but AMP has a much smaller  $\Delta G^\circ$  near 9.2 kJ Hydrolysis and Coupling ATP hydrolysis is most likely to be encountered in the context of coupled reactions. Many coupled reactions use ATP as an energy source. For example, the movement of sodium and potassium against their electrochemical gradients requires energy, which is harnessed from the hydrolysis of ATP. ATP cleavage is the transfer of a high-energy phosphate group from ATP to another molecule. Generally, this activates or inactivates the target molecule. With these phosphoryl group transfers, the overall free energy of the reaction will be determined by taking the sum of the free energies of the Hess's law, discussed in Chapter 7 of MCAT General Chemistry Review, applies for all of the state functions, including pressure, density, temperature, volume, enthalpy, internal energy, free energy, and entropy. Phosphoryl Group Transfers ATP can provide a phosphate group as a reactant. For example, in the phosphorylation of glucose in the early stages of glycolysis, ATP donates a phosphate group to glucose to form glucose 6-phosphate. The information in Table 12.1 indicates the free

energy of hydrolysis, which can be conceptualized as the transfer of the phosphate group to water. To determine the free energy of phosphoryl group transfer to another biological molecule, one could use Hess's law and calculate the difference in free energy between the reactants and products: Creatine phosphate + H<sub>2</sub>O → ADP + P<sub>i</sub> → ATP + H<sub>2</sub>O (from Table 12.1)

Creatine phosphate + ADP → Creatine + ATP

MCAT CONCEPT CHECK 12.2 Before you move on, assess your understanding of the material with these questions.

1. How does coupling with ATP hydrolysis alter the energetics of a reaction?
2. Explain why ATP is an inefficient molecule for long-term energy storage.
3. Using Table 12.1, calculate the free energy change for the synthesis of ATP from cAMP and inorganic phosphate. Note: cAMP is hydrolyzed to AMP, and the free energy of hydrolysis for ATP and ADP is approximately equal.

### 12.3 Biological Oxidation and Reduction

After Chapter 12.3, you will be able to:

- Explain the benefits of analyzing half reactions for biological oxidation–reduction
- Recall soluble electron carriers, such as NADH and CoQ, and the pathways they are paired with
- Many key enzymes in ATP synthesis and other biochemical pathways have

Just as you practiced with general chemistry, an important skill in biochemistry is to be able to divide oxidation–reduction reactions into their half-reaction components to determine the number of electrons being transferred. For example, in lactic acid fermentation, pyruvate and NADH are converted to lactate and NAD<sup>+</sup> by lactate dehydrogenase. This reaction can be broken down into half-reactions as follows:

Remember that spontaneous oxidation–reduction reactions have a negative value of  $\Delta G$  and a positive value of  $E$  (electromotive force). Oxidation–reduction reactions, discussed in Chapter 11 of MCAT General Chemistry Review and Chapter 4 of MCAT Organic Chemistry Review, are a staple of general chemistry and are characteristic of oxidoreductase enzymes. Take a moment to identify the oxidizing and reducing agents in the reaction catalyzed by lactate dehydrogenase. In the cytoplasm, there are several molecules that act as high-energy electron carriers. These are all soluble and include NADH, NADPH, FADH<sub>2</sub>, ubiquinone, cytochromes, and glutathione. Some of these electron carriers are used by the mitochondrial electron transport chain, which leads to the oxidative phosphorylation of ADP to ATP. As electrons are

passed down the electron transport chain, they give up their free energy to form the proton-motive force across the inner mitochondrial membrane. In addition to soluble electron carriers, there are membrane-bound electron carriers embedded within the inner mitochondrial membrane. One such carrier is flavin mononucleotide (FMN), which is bonded to complex I of the electron transport chain and can also act as a soluble electron carrier. In general, proteins with prosthetic groups containing iron-sulfur clusters are particularly well suited for the transport of electrons. Flavoproteins contain a modified vitamin B<sub>2</sub>, or riboflavin. They are nucleic acid derivatives, generally either flavin adenine dinucleotide (FAD) or flavin mononucleotide (FMN). Flavoproteins are most notable for their presence in the mitochondria and chloroplasts as electron carriers.

$$\text{C}_3\text{H}_4\text{O}_3 + \text{NADH} + \text{H}^+ \rightarrow \text{C}_3\text{H}_6\text{O}_3 + \text{NAD}^+$$

$$\text{C}_3\text{H}_4\text{O}_3 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{C}_3\text{H}_6\text{O}_3 + 2\text{H}^+ + 2\text{e}^-$$

Flavoproteins are also involved in the modification of other B vitamins to active forms. Finally, flavoproteins function as coenzymes for enzymes in the oxidation of fatty acids, the decarboxylation of pyruvate, and the reduction of glutathione. Deficiency of riboflavin, a key component of flavoproteins, leads to a lack of growth, failure to thrive, and eventual death in experimental models. In humans, riboflavin deficiency is very rare, but may occur in severely malnourished individuals.

**MCAT CONCEPT CHECK 12.3** Before you move on, assess your understanding of the material with these questions.

1. What is an advantage of analyzing the half-reactions in biological oxidation and
2. Name three soluble electron carriers and their relevant metabolic pathways in the

**12.4 Metabolic States** After Chapter 12.4, you will be able to:

- Identify disequilibria that are maintained at energetic cost within the cell
- Compare the behavior of different tissues during postprandial, postabsorptive, and prolonged fasting states
- Associate the three metabolic states with related hormone activity

One of the key differences between general chemistry and biochemistry is whether or not equilibrium is seen as a desirable state. Biochemists emphatically believe that it is not! Equilibrium is a fixed state, which prevents us from storing any energy for later use or creating an excitable environment. Instead, biochemists seek a state of homeostasis. Homeostasis is a physiological tendency toward a relatively stable state that is maintained and

adjusted, often with the expenditure of energy. Most compounds in the body are actually maintained at a homeostatic level that is different from equilibrium, which allows us to store potential energy; for example, keeping sodium concentrations much higher outside a neuron than inside it creates a gradient that stores energy. In this state, reactions can proceed such that equilibrium is put off for a long time (someone born today can delay equilibrium for about 80 years). The pathways that are operational in fuel metabolism depend on the nutritional status of the organism. Shifts between storage and mobilization of a particular fuel, as well as shifts among the types of fuel being used, are very pronounced when going from the well-fed state to an overnight fast, and finally to a prolonged state of starvation. We'll take a look at how fuel metabolism is regulated in each state. Remember that in addition to the "big-picture view" discussed here, the specific regulatory steps of each pathway are discussed in the previous chapters of MCAT Biochemistry Review: Chapter 9 (glycolysis, glycogenesis, glycogenolysis, gluconeogenesis, and the pentose phosphate pathway), Chapter 10 (the citric acid cycle, electron transport chain, and oxidative phosphorylation), and Chapter 11 (fatty acid and cholesterol synthesis,  $\beta$ -oxidation, ketogenesis and ketolysis, and amino acid metabolism).

**Postprandial (Absorptive) State** The postprandial state, also called the absorptive or well-fed state, occurs shortly after eating. This state is marked by greater anabolism (synthesis of biomolecules) and fuel storage than catabolism (breakdown of biomolecules for energy). Nutrients flood in from the gut and make their way via the hepatic portal vein to the liver, where they can be stored or distributed to other tissues of the body. The postprandial state generally lasts three to five hours after eating a meal. Just after eating, blood glucose levels rise and stimulate the release of insulin. The three major target tissues for insulin are the liver, muscle, and adipose tissue, as shown in Figure 12.2. Insulin promotes glycogen synthesis in liver and muscle. After the glycogen stores are filled, the liver converts excess glucose to fatty acids and triacylglycerols. Insulin promotes triacylglycerol synthesis in adipose tissue and protein synthesis in muscle, as well as glucose entry into both tissues. After a meal, most of the energy needs of the liver are met by the oxidation of excess amino acids. Figure

12.2 Metabolic Profile of the Postprandial (Absorptive) State Two types of cells—nervous tissue and red blood cells—are notably insensitive to insulin. Nervous tissue derives energy from oxidizing glucose to CO<sub>2</sub> and water in both the well-fed and normal fasting states. Only in prolonged fasting does this situation change. Red blood cells can only use glucose anaerobically for all their energy needs, regardless of the individual's Postabsorptive (Fasting) State. Glucagon, cortisol, epinephrine, norepinephrine, and growth hormone oppose the actions of insulin. These hormones are sometimes termed counterregulatory hormones because of their effects on skeletal muscle, adipose tissue, and the liver, which are opposite to the actions of insulin. In the liver, glycogen degradation and the release of glucose into the blood are stimulated, as shown in Figure 12.3. Hepatic gluconeogenesis is also stimulated by glucagon, but the response is slower than that of glycogenolysis. Whereas glycogenolysis begins almost immediately at the beginning of the postabsorptive state, gluconeogenesis takes about 12 hours to hit maximum velocity. Figure 12.3 Metabolic Profile of the Postabsorptive (Fasting) State The release of amino acids from skeletal muscle and fatty acids from adipose tissue are both stimulated by the decrease in insulin and by an increase in levels of epinephrine. Once carried into the liver, amino acids and fatty acids can provide the necessary carbon skeletons and energy required for Prolonged Fasting (Starvation) Levels of glucagon and epinephrine are markedly elevated during starvation. Increased levels of glucagon relative to insulin result in rapid degradation of glycogen stores in the liver. As liver glycogen stores are depleted, gluconeogenic activity continues and plays an important role in maintaining blood glucose levels during prolonged fasting; after about 24 hours, gluconeogenesis is the predominant source of glucose for the body. Lipolysis is rapid, resulting in excess acetyl-CoA that is used in the synthesis of ketone bodies. Once levels of fatty acids and ketones are high enough in the blood, muscle tissue will utilize fatty acids as its major fuel source and the brain will adapt to using ketones for energy. After several weeks of fasting, the brain derives approximately two-thirds of its energy from ketones and one-third from glucose. The shift from glucose to ketones as the major fuel reduces the quantity of



amino acids that must be degraded to support gluconeogenesis, which spares proteins that are vital for other functions. Cells that have few, if any, mitochondria, like red blood cells, continue to be dependent on glucose for their energy.

**MCAT CONCEPT CHECK 12.4** Before you move on, assess your understanding of the material with these questions.

1. Provide an example of disequilibrium that is maintained at the expense of cellular
2. What tissue is least able to change its fuel source in periods of prolonged
3. During what stage is there the greatest decrease in the circulating concentration of

**12.5 Hormonal Regulation of Metabolism**

After Chapter 12.5, you will be able to:

- Describe the impact of key metabolic hormones, such as insulin, glucagon, and thyroid hormones, on metabolic function
- Apply knowledge of the metabolic hormones to a given disease state
- Recall the general structures and traits of metabolic hormones

If each cell were acting independently of one another, metabolism would be a random process that could not be coordinated with outside events like meals or exertion. In order to make the most efficient use of the resources available, metabolism must be regulated across the entire organism. This regulation is accomplished best through hormonal means. Water-soluble peptide hormones, like insulin, are able to rapidly adjust the metabolic processes of cells via second messenger cascades, while certain fat-soluble amino acid-derivative hormones, like thyroid hormones, and steroid hormones, like cortisol, enact longer-range effects by exerting regulatory actions at the transcriptional level. Hormone levels are regulated by feedback loops with other endocrine structures, such as the hypothalamic-pituitary axis, or by the biomolecule upon which they act; for example, insulin causes a decrease in blood glucose, which removes the trigger for continued insulin release. Next, we'll examine the specific actions of several hormones involved in the regulation of metabolism and in maintaining homeostasis, including insulin and glucagon, epinephrine, glucocorticoids, and thyroid hormones.

**Insulin and Glucagon** Insulin is a peptide hormone secreted by the  $\beta$ -cells of the pancreatic islets of Langerhans, as shown in Figure 12.4. It is a key player in the uptake and storage of glucose. Glucose is absorbed by peripheral tissues via facilitated transport mechanisms that utilize glucose transporters located in the cell membrane. The

tissues that require insulin for effective uptake of glucose are adipose tissue and resting skeletal muscle. Tissues in which glucose uptake is not affected by insulin include: Figure 12.4 Insulin (Light Brown) in Pancreatic  $\beta$ -Cells Red blood cells (erythrocytes)  $\beta$ -cells of the pancreas Take note of the differences between these types of tissues. Some tissues that require insulin actively store glucose when it is present in high concentrations, while other tissues that do not require insulin must still be able to absorb glucose even when the glucose concentration is low. Insulin impacts the metabolism of the different nutrient classes in different ways. For carbohydrates, insulin increases the uptake of glucose and increases carbohydrate metabolism in muscle and fat. Increased glucose in muscle can be used as additional fuel to burn during exercise, or can be stored as glycogen. Insulin also increases glycogen synthesis in the liver by increasing the activity of glucokinase and glycogen synthase, while decreasing the activity of enzymes that promote glycogen breakdown (glycogen phosphorylase and glucose-6-phosphatase). While the primary effects of insulin are on carbohydrate metabolism, it also changes the way that the body processes other macromolecules. For instance, insulin increases amino acid uptake by muscle cells, thereby increasing levels of protein synthesis and decreasing breakdown of essential proteins. Insulin also exhibits a significant impact on the metabolism of fats, especially in the liver and adipocytes. The effects of insulin on the metabolism of fats are described below. Glucose and triacylglycerol uptake by fat cells Lipoprotein lipase activity, which clears VLDL and chylomicrons from Triacylglycerol synthesis (lipogenesis) in adipose tissue and the liver Triacylglycerol breakdown (lipolysis) in adipose tissue Formation of ketone bodies by the liver The most important controller of insulin secretion is plasma glucose. Above a threshold of 100 mg dL , or about 5.6 mM glucose, insulin secretion is directly proportional to plasma glucose. For glucose to promote insulin secretion, it must not only enter the  $\beta$ -cell but also be metabolized, increasing intracellular ATP concentration. Increased ATP leads to calcium release in the cell, which promotes exocytosis of preformed insulin from intracellular vesicles. Insulin secretion is also affected by signaling initiated by other hormones, such as glucagon and somatostatin. Patients with type

1 diabetes mellitus are incapable of synthesizing insulin, but still synthesize glucagon. This combination increases blood sugar much more than if an individual were to lose all pancreatic function or to develop insulin insensitivity. Glucagon is a peptide hormone secreted by the  $\alpha$ -cells of the pancreatic islets of Langerhans, as shown in Figure 12.5. The primary target for glucagon action is the hepatocyte. Glucagon acts through second messengers to cause the following effects: Figure 12.5 Glucagon (Dark Brown) in Pancreatic  $\alpha$ -Cells Increased liver glycogenolysis. Glucagon activates glycogen phosphorylase and inactivates glycogen synthase. Increased liver gluconeogenesis. Glucagon promotes the conversion of pyruvate to phosphoenolpyruvate by pyruvate carboxylase and phosphoenolpyruvate carboxykinase (PEPCK). Glucagon increases the conversion of fructose 1,6-bisphosphate to fructose 6-phosphate by Increased liver ketogenesis and decreased lipogenesis. Increased lipolysis in the liver. Glucagon activates hormone-sensitive lipase in the liver. Because the action is on the liver and not the adipocyte, glucagon is not considered a major fat-mobilizing Low plasma glucose (hypoglycemia) is the most important physiological promoter of glucagon secretion, and elevated plasma glucose (hyperglycemia) is the most important inhibitor. Amino acids, especially basic amino acids (arginine, lysine, histidine), also promote the secretion of glucagon. Thus, glucagon is secreted in response to the ingestion of a meal rich in proteins.

Functional Relationship of Glucagon and Insulin Insulin, associated with a well-fed, absorptive metabolic state, and glucagon, associated with a postabsorptive metabolic state, usually oppose each other with respect to pathways of energy metabolism. Enzymes that are phosphorylated by glucagon are generally dephosphorylated by insulin; enzymes that are phosphorylated by insulin are generally dephosphorylated by glucagon. Figure 12.6 displays a feedback diagram of the interaction of insulin and glucagon on plasma glucose concentration, as well as fat and Figure 12.6 Relationship of Glucagon and Insulin in Metabolism The endocrine system, discussed in Chapter 5 of MCAT Biology Review, is a major regulator of homeostasis. Like the glucocorticoids and catecholamines, mineralocorticoids and sex hormones are also synthesized by the adrenal glands and play a more minor role in

Glucocorticoids from the adrenal cortex are responsible for part of the stress response. In order to make a getaway in the “fight-or-flight” response, glucose must be rapidly mobilized from the liver in order to fuel actively contracting muscle cells while fatty acids are released from adipocytes. Glucocorticoids, especially cortisol, are secreted with many forms of stress, including exercise, cold, and emotional stress. Cortisol, shown in Figure 12.7, is a steroid hormone that promotes the mobilization of energy stores through the degradation and increased delivery of amino acids and increased lipolysis. Cortisol also elevates blood glucose levels, increasing glucose availability for nervous tissue through two mechanisms. First, cortisol inhibits glucose uptake in most tissues (muscle, lymphoid, and fat) and increases hepatic output of glucose via gluconeogenesis, particularly from amino acids. Second, cortisol has a permissive function that enhances the activity of glucagon, epinephrine, and other catecholamines. Long-term exposure to glucocorticoids may be required clinically, but causes persistent hyperglycemia, which stimulates insulin. This actually promotes fat storage in the adipose tissue, rather than lipolysis.

**Figure 12.7 Structure of Cortisol** An enlarged adrenal gland (with a tumor of the adrenal cortex) is shown in Figure 12.8. While the adrenal cortex produces steroid hormones (glucocorticoids, mineralocorticoids, and sex hormones), the adrenal medulla produces catecholamines.

**Figure 12.8 Adrenal Gland (Enlarged)** The adrenal cortex (yellow) and adrenal medulla (brown interior) are visible on both slices. Catecholamines are secreted by the adrenal medulla and include epinephrine and norepinephrine, also known as adrenaline and noradrenaline. The structures of these hormones are shown in Figure 12.9. Catecholamines increase the activity of liver and muscle glycogen phosphorylase, thus promoting glycogenolysis. This increases glucose output by the liver. Glycogenolysis also increases in skeletal muscle, but because muscle lacks glucose-6-phosphatase, glucose cannot be released by skeletal muscle into the bloodstream; instead, it is metabolized by the muscle tissue itself. Catecholamines act on adipose tissue to increase lipolysis by increasing the activity of hormone-sensitive lipase. Glycerol from triacylglycerol breakdown is a minor substrate for gluconeogenesis. Epinephrine also acts directly on target organs like the heart to

increase the basal metabolic rate through the sympathetic nervous system. This increase in metabolic function is often associated with an adrenaline rush. Figure 12.9 Structures of Adrenal Catecholamines (a) Epinephrine; (b) While thyroid hormones are not responsible for day-to-day adjustments in metabolism, insufficient thyroid hormone levels (hypothyroidism) can cause symptoms including cold intolerance, fatigue, weight gain, and depression as metabolism suffers. Excessive thyroid hormone levels (hyperthyroidism) can cause rapid weight loss, anxiety, jitteriness, and Thyroid hormone activity is largely permissive. In other words, thyroid hormone levels are kept more or less constant, rather than undulating with changes in metabolic state. Thyroid hormones increase the basal metabolic rate, as evidenced by increased O<sub>2</sub> consumption and heat production when they are secreted. The increase in metabolic rate produced by a dose of thyroxine (T<sub>4</sub>) occurs after a latency of several hours but may last for several days, while triiodothyronine (T<sub>3</sub>) produces a more rapid increase in metabolic rate and has a shorter duration of activity. The subscript numbers refer to the number of iodine atoms in the hormone; iodine atoms are represented by purple spheres in the structures shown in Figure 12.10. T<sub>4</sub> can be thought of as the precursor to T<sub>3</sub>; deiodonases (enzymes that remove iodine from a molecule) are located in target tissues and convert T<sub>4</sub> to T<sub>3</sub>. Thyroid hormones have their primary effects in lipid and carbohydrate metabolism. They accelerate cholesterol clearance from the plasma and increase the rate of glucose absorption from the small intestine. Epinephrine requires thyroid hormones to have a significant metabolic effect. Figure 12.10 Structures of Thyroid Hormones (a) Triiodothyronine (T<sub>3</sub>); (b) MCAT CONCEPT CHECK 12.5 Before you move on, assess your understanding of the material with these questions. 1. Describe the primary metabolic function of each of the following hormones: Thyroid hormones (T<sub>3</sub> / T<sub>4</sub>); 2. Thyroid storm is a potentially lethal state of extreme hyperthyroidism in which T<sub>3</sub> and T<sub>4</sub> levels are significantly above normal limits. What vital sign abnormalities might be expected in a patient with thyroid storm? 12.6 Tissue-Specific Metabolism After Chapter 12.6, you will be able to: Identify the preferred fuel sources and fuel quantities for different tissue types, including skeletal muscle and the brain

Recall the metabolic functions of the liver. Tissues have evolved so that their metabolic needs are met in a way corresponding to their form and function. The major sites of metabolic activity in the body are the liver, skeletal and cardiac muscles, brain, and adipocytes. Connective tissue and epithelial cells do not make major contributions to the consumption of energy. Remember though, that epithelial cells are the primary secretory cells, so they are involved in the regulation of metabolism. We have already discussed how the body operates under different nutritional conditions. The organ-specific patterns of fuel utilization in the well-fed and fasting states are summarized in Table 12.2.

State	Glucose	Amino Acids	Fatty Acids	Ketones
Well-Fed	High	Low	Low	Low
Fasting	Low	High	High	High

Two major roles of the liver in fuel metabolism are to maintain a constant level of blood glucose under a wide range of conditions and to synthesize ketones when excess fatty acids are being oxidized. After a meal, glucose concentration in the portal blood is elevated. The liver extracts excess glucose and uses it to replenish its glycogen stores. Any glucose remaining in the liver is then converted to acetyl-CoA and used for fatty acid synthesis. The increase in insulin after a meal stimulates both glycogen synthesis and fatty acid synthesis in the liver. The fatty acids are converted to triacylglycerols and released into the blood as very-low-density lipoproteins (VLDL). In the well-fed state, the liver derives most of its energy from the oxidation of excess amino acids. Between meals and during prolonged fasts, the liver releases glucose into the blood. The increase in glucagon during fasting promotes both glycogen degradation and gluconeogenesis. Lactate from anaerobic metabolism, glycerol from triacylglycerols, and amino acids provide carbon skeletons for glucose. After a meal, elevated insulin levels stimulate glucose uptake by adipose tissue. Insulin also triggers fatty acid release from VLDL and chylomicrons (which carry triacylglycerols absorbed from the gut). Lipoprotein lipase, an enzyme found in the capillary bed of adipose tissue, is also induced by insulin. The fatty acids that are released from lipoproteins are taken up by adipose tissue and re-esterified to triacylglycerols for storage. The glycerol phosphate required for triacylglycerol synthesis

comes from glucose that is metabolized in adipocytes as an alternative product of glycolysis. Insulin can also effectively suppress the release of fatty acids from adipose tissue. During the fasting state, decreased levels of insulin and increased epinephrine activate hormone-sensitive lipase in fat cells, allowing fatty acids to be released into circulation. The major fuels of skeletal muscle are glucose and fatty acids. Because of its enormous bulk, skeletal muscle is the body's major consumer of fuel. After a meal, insulin promotes glucose uptake in skeletal muscle, which replenishes glycogen stores and amino acids used for protein synthesis. Both excess glucose and amino acids can also be oxidized for energy. In the fasting state, resting muscle uses fatty acids derived from free fatty acids circulating in the bloodstream. Ketone bodies may also be used if the fasting state is prolonged. Fast-twitch muscle fibers have a high capacity for anaerobic glycolysis but are quick to fatigue. They are involved primarily in short-term, high-intensity exercise. Slow-twitch muscle fibers in arm and leg muscles are well vascularized and primarily oxidative. They are used during prolonged, low-to-moderate intensity exercise and resist fatigue. Slow-twitch fibers and the number of their mitochondria increase dramatically in trained endurance athletes. The musculoskeletal system is discussed in Chapter 11 of MCAT. The primary fuel used to support muscle contraction depends on the magnitude and duration of exercise as well as the major fibers involved. A very short-lived source of energy (2–7 seconds) comes from creatine phosphate, which transfers a phosphate group to ADP to form ATP. Skeletal muscle has stores of both glycogen and some triacylglycerols. Blood glucose and free fatty acids may also be used. Short bursts of high-intensity exercise are also supported by anaerobic glycolysis drawing on stored muscle glycogen. During moderately high-intensity, continuous exercise, oxidation of glucose and fatty acids are both important, but after 1 to 3 hours of continuous exercise at this level, muscle glycogen stores become depleted, and the intensity of exercise declines to a rate that can be supported by oxidation of fatty acids. Unlike other tissues of the body, cardiac myocytes prefer fatty acids as their major fuel, even in the well-fed state. When ketones are present during prolonged fasting, they can also be used. Thus, not surprisingly, cardiac

myocytes most closely parallel skeletal muscle during extended periods of exercise. In patients with cardiac hypertrophy (thickening of the heart muscle), this situation reverses to some extent. In a failing heart, glucose oxidation increases and  $\beta$ -oxidation falls. Although the brain represents only 2 percent of total body weight, it obtains 15 percent of the cardiac output, uses 20 percent of the total O<sub>2</sub>, and consumes 25 percent of the total glucose, the brain's primary fuel. Blood glucose levels are tightly regulated to maintain a sufficient glucose supply for the brain (and sufficient concentration while studying). Normal function depends on a continuous glucose supply from the bloodstream. In hypoglycemic conditions (< 70 mg dL ), hypothalamic centers in the brain sense a fall in blood glucose level, and the release of glucagon and epinephrine is triggered. Fatty acids cannot cross the blood-brain barrier and are therefore not used at all as an energy source. Between meals, the brain relies on blood glucose supplied by either hepatic glycogenolysis or gluconeogenesis. Only during prolonged fasting does the brain gain the capacity to use ketone bodies for energy, and even then, the ketone bodies only supply approximately two-thirds of the fuel; the remainder is glucose.

BIOCHEMISTRY GUIDED EXAMPLE WITH EXPERT A diet high in fat, low in carbohydrates, and sufficient in protein will automatically shift energy production in the body from being primarily dependent on glucose to primarily driven by ketone bodies. This dietary approach, termed a "ketogenic diet," was developed nearly 100 years ago as a metabolic therapy to mimic the metabolic changes that occur during fasting after observing that, upon halting food intake, seizures would stop in epileptic patients. Metabolic dysfunction is increasingly appreciated as a fundamental pathology across disease states, including neurodegenerative diseases, brain cancer, and treatment or reversal of type II diabetes and metabolic syndrome. Furthermore, implementing a ketogenic diet has shown improvement in these diseases. However, to date, there is no confirmation of any fundamental metabolic mechanism(s) that could explain the diverse beneficial effects seen across these Ketogenic diet (KD) = high fat, low carbs KD known to help A number of diseases are improved with KD know how KD works to help so many One possible avenue is exploring differential cellular energy production, which depends on the



metabolic coenzyme nicotinamide adenine dinucleotide (NAD<sup>+</sup>), a marker for mitochondrial and cellular health. Furthermore, NAD<sup>+</sup> activates downstream signaling pathways (such as the sirtuin enzymes) associated with major benefits such as longevity and reduced inflammation; thus, increasing NAD<sup>+</sup> is a coveted therapeutic endpoint. The Diagram 1 below outlines the usage of NAD<sup>+</sup> during the metabolism of glucose and ketone bodies ( $\beta$ -hydroxybutyrate and acetoacetate are both ketone bodies). Glucose uses 4 NAD<sup>+</sup> to get to 2 acetyl-CoA, while  $\beta$ -hydroxybutyrate uses 1 NAD<sup>+</sup> to get to 2 acetyl-CoA. Adapted from Elamin, M., Ruskin, D. N., Masino, S. A., & Sacchetti, P. (2017). Ketone-based metabolic therapy: is increased NAD<sup>+</sup> a primary mechanism? *Frontiers in Molecular Biosciences*. Given the information in the passage, if the researchers were to assay mice that were fed a ketogenic diet versus normal chow, how would the NAD<sup>+</sup>/NADH ratio in ketogenic mice compare to that of normal mice? Why would the researchers likely be more interested in measuring NAD<sup>+</sup>/NADH ratios specifically in the brain? The first question asks us to compare the NAD<sup>+</sup>/NADH ratio in KD mice to that of mice that were fed a normal diet, which means we should be combining our content background with the information in the passage to generate an answer. We know normal diets tend to be high in carbohydrates, whereas a ketogenic diet will be high in ketone bodies. Diagram 1 demonstrates that the metabolism of glucose and the metabolism of  $\beta$ -hydroxybutyrate each produce two acetyl-CoA molecules. However, the metabolism of glucose converts four NAD<sup>+</sup> molecules to NADH, while the metabolism of  $\beta$ -hydroxybutyrate only converts one NAD<sup>+</sup> molecule to NADH. This difference generates a higher NAD<sup>+</sup>/NADH ratio in those mice that are subsisting on a KD diet, as NADH levels are relatively constant (due to its production from other sources in the body) but NAD<sup>+</sup> availability has increased. The answer to the second question is superficially answered in the first paragraph—many of the diseases mentioned are focused on the brain (epilepsy, neurodegenerative diseases, brain cancer). However, if we dig a little deeper into our content background, we know that the brain can use only glucose or ketone bodies as its source of energy and there are no energy storage molecules, like glycogen or adipose cells, present in

the brain. So, even in the early days of a ketogenic diet, while other tissues are still using alternative energy sources such as fatty acids, the brain is already shifting to utilizing a higher proportion of ketone bodies. Thus, an increased NAD<sup>+</sup>/NADH ratio, as well as its potential associated benefits, will occur in the brain sooner and to a greater extent than anywhere else in the body. The passage states that NAD<sup>+</sup> activates pathways involving sirtuin enzymes, which reduce inflammation and fight the aging process. Such physiological changes also indirectly explain why a ketogenic diet could potentially help in so many brain-based diseases. In short, mice on ketogenic diets would likely have a higher NAD<sup>+</sup>/NADH ratio compared to mice on a normal diet, and NAD<sup>+</sup> levels in the brain would likely be more susceptible to diet changes because the brain only relies on plasma glucose and ketone bodies for

MCAT  
CONCEPT CHECK 12.6 Before you move on, assess your understanding of the material with these questions. 1. What is the preferred fuel for most cells in the well-fed state? What is the exception and its preferred fuel? Preferred fuel: \_\_\_\_\_ Exception: \_\_\_\_\_

Preferred fuel: \_\_\_\_\_ 2. What organ consumes the greatest amount of glucose relative to its percentage of 3. Describe the major metabolic functions of the liver.

12.7  
Integrative Metabolism After Chapter 12.7, you will be able to: Predict changes to respiratory quotient with changes in activity Explain the role of leptin, ghrelin, and orexin in regulating body mass Apply knowledge of measurement methods for metabolism to analytical approaches in a lab setting The MCAT does not expect you to know what levels are healthy for any of these indicators, but can easily pose data interpretation questions related to them.

Analysis of Metabolism There are several methods of analyzing metabolic control of an organism. In humans, levels of glucose, thyroid hormones and thyroid-stimulating hormone, insulin, glucagon, oxygen, and carbon dioxide can all be measured in the blood. Because these hormones and substrates have a predictable effect on metabolism, they can be used as indicators of metabolic function. They can also be used as indicators of disorders, as in the case of blood glucose or thyroid-stimulating hormone. Respirometry allows accurate measurement of the respiratory quotient, which differs depending on the fuels being used by

the organism. The respiratory quotient (RQ) can be measured experimentally, and can be  $RQ = \frac{\text{CO}_2 \text{ produced}}{\text{O}_2 \text{ consumed}}$ . The respiratory quotient for carbohydrates is around 1.0, while the respiratory quotient for lipids is around 0.7. In resting individuals, the respiratory quotient is generally around 0.8, indicating that both fat and glucose are consumed. The respiratory quotient changes under conditions of high stress, starvation, and exercise as predicted by the actions of different hormones. Calorimeters can measure basal metabolic rate (BMR) based on heat exchange with the environment. Human calorimetry makes use of large insulated chambers with specialized heat sinks to determine energy expenditure. Because of the isolationist nature of testing and the expense of creating a calorimetry chamber, other measures of BMR are preferred. Because of previous experimentation, BMR can be estimated based on age, weight, height, and phenotypical sex.

**Regulation of Body Mass** Until now, we've been discussing metabolism on a very small scale, but metabolic controls are also involved in maintaining body mass (weight loss or gain). Body mass is determined by several factors, including water, carbohydrates, proteins, and lipids, while nucleic acids do not contribute significantly to its maintenance. The overall mass of carbohydrates and proteins tends to be stable over time, although it can be modified slightly by periods of prolonged starvation or by significant muscle-building activities. Water is very quickly adjusted by the endocrine system and the kidneys; therefore, it does not factor into our discussion of obesity and weight regulation. Water is the primary source of frequent minor weight fluctuations because it is subject to rapid adjustment. Therefore, lipids, stored in adipocytes, are the primary factor in the gradual change of body mass over time. An individual who is maintaining body weight consumes the same amount of energy that is spent on average each day. If energy consumed is greater than energy expenditure over a significant period of time, then fat stores begin to accumulate. The opposite is also seen. If an energy deficit exists where calories consumed are less than calories burned, then a decrease in weight is observed. As individuals increase in mass, basal metabolic rate (the amount of energy required for one sedentary day) also increases. Thus, a caloric excess will cause an

increase in body mass until equilibrium is reached between the new basal metabolic rate and the existing intake. In weight loss the reverse trend is seen. This effect does have a threshold that differs between individuals. Small adjustments in intake, even over a prolonged period of time, are partially or fully compensated by changes in energy expenditure. Similarly, a small increase or decrease in activity level will be compensated by changes in hunger. Deliberate alterations of body mass require alterations above this threshold level, which is larger in negative energy balance than in positive energy balance—in other words, larger changes must be made to lose weight than to gain it. Motivation, a psychological concept discussed in Chapter 5 of MCAT Behavioral Sciences Review, is often linked with physiological drives and signaling pathways. The hypothalamus, which produces orexin and responds to leptin and ghrelin, is responsible for regulating hunger, thirst, and libido. Diet (energy intake) and exercise (energy expenditure), genetics, socioeconomic status, and geography all play key roles in weight control. As described earlier, hormonal control by thyroid hormones, cortisol, epinephrine, glucagon, and insulin is critical to the integration of metabolism. In addition, there are hormones that control hunger and satiety, including ghrelin, orexin, and leptin. Have you ever wondered why, even if you don't feel hungry, when you walk into your favorite restaurant you're suddenly ravenous? This is the job of ghrelin and orexin. Ghrelin is secreted by the stomach in response to signals of an impending meal. Sight, sound, taste, and especially smell all act as signals for its release. Ghrelin increases appetite and also stimulates secretion of orexin. Orexin further increases appetite, and is also involved in alertness and the sleep–wake cycle. Hypoglycemia is also a trigger for orexin release. Leptin is a hormone secreted by fat cells that decreases appetite by suppressing orexin production. Genetic variations in the leptin molecule and its receptors have been implicated in obesity; a knockout mouse unable to produce leptin is shown on the left in Figure 12.11. These messengers and receptors are the target of current research; for now, questions regarding body mass modifications on the MCAT mostly come down to diet and exercise. Figure 12.11 Leptin Knockout Mouse (left) Compared to Normal Mouse (right) Body mass can be measured and

tracked using the body mass index (BMI), which is given by:  $BMI = \frac{\text{mass}}{\text{height}^2}$  where mass is measured in kilograms and height is measured in meters. A normal BMI is considered to be between 18.5 and 25; values lower than this are considered underweight. A BMI between 25 and 30 is considered overweight, whereas a BMI over 30 is considered obese.

**MCAT CONCEPT CHECK 12.7** Before you move on, assess your understanding of the material with these questions.

1. How is the respiratory quotient expected to change when a person transitions from resting to brief exercise?
2. True or False: Body mass can be predicted by the leptin receptor phenotype and caloric intake alone.
3. True or False: It is easier to gain weight than to lose weight.
4. If you were designing a study to assess metabolism, which measurement method would you choose? Defend your answer.

In this chapter, we reviewed the principles of thermodynamics and thermochemistry that were introduced in general chemistry and physics and their applications to biological systems. We looked at the specific energy molecules of human metabolism, sources of energy, and key reaction types in ATP synthesis and hydrolysis. We compared different energy states and their impact on overall metabolism and tissue-specific metabolism. At this point you should have a decent idea about how to determine what energy sources are being used from experimental data, and be able to make predictions about the changes in metabolism under varying conditions. Congratulations, because this is the last chapter of MCAT Biochemistry Review and you're just about ready to tackle any of the challenges that you will face on Test Day. Continue practicing, and try not to skip lunch! You've reviewed the content, now test your knowledge and critical thinking skills by completing a test-like passage set in your online resources!

**Thermodynamics and Bioenergetics**

Biological systems are considered:

- Open, wherein matter and energy can be exchanged with the
- Closed, wherein only energy can be exchanged with the
- This determination is made based on the examination of the entire organism or an isolated process.

Changes in enthalpy in a closed biological system are equal to changes in internal energy, which is equal to heat exchange within. No work is performed in a closed biological system because pressure and volume remain constant. Entropy is a measure of energy

dispersion in a system. Physiological concentrations are usually much less than standard Free energy calculations must be adjusted for pH ( $\Delta G^\circ$ ), temperature ( $37^\circ\text{C} = 98.6^\circ\text{F} = 310\text{ K}$ ), and concentrations. The Role of ATP ATP is a mid-level energy molecule. ATP contains high-energy phosphate bonds that are stabilized upon hydrolysis by resonance, ionization, and loss of charge repulsion. ATP provides energy through hydrolysis and coupling to energetically unfavorable reactions. ATP can also participate in phosphoryl group transfers as a Biological Oxidation and Reduction Biological oxidation and reduction reactions can be broken down into component half-reactions. Half-reactions provide useful information about stoichiometry and Many oxidation–reduction reactions involve an electron carrier to transport high-energy electrons. Electron carriers may be soluble or membrane-bound. Flavoproteins are one subclass of electron carriers that are derived from riboflavin (vitamin B2). Equilibrium is an undesirable state for most biochemical reactions because organisms need to harness free energy to survive. In the postprandial/well-fed (absorptive) state, insulin secretion is high and anabolic metabolism prevails. In the postabsorptive (fasting) state, insulin secretion decreases while glucagon and catecholamine secretion increases. This state is observed in short-term fasting (overnight). There is a transition to catabolic metabolism. Prolonged fasting (starvation) dramatically increases glucagon and Most tissues rely on fatty acids. At maximum, 2 of the brain's energy can be derived from ketone Hormonal Regulation of Metabolism Insulin and glucagon have opposing activities during most aspects of Insulin causes a decrease in blood glucose levels by increasing Insulin increases the rate of anabolic metabolism. Insulin secretion by pancreatic  $\beta$ -cells is regulated by blood glucose Glucagon increases blood glucose levels by promoting gluconeogenesis and glycogenolysis in the liver. Glucagon secretion by pancreatic  $\alpha$ -cells is stimulated by both low glucose and high amino acid levels. Glucocorticoids increase blood glucose in response to stress by mobilizing fat stores and inhibiting glucose uptake. Glucocorticoids increase the impact of glucagon and Catecholamines promote glycogenolysis and increase basal metabolic rate through their sympathetic nervous system activity. Thyroid hormones modulate the impact of other

metabolic hormones and have a direct impact on basal metabolic rate. T3 is more potent than T4, but has a shorter half-life and is available in lower concentrations in the blood. T4 is converted to T3 at the tissues. The liver is the most metabolically diverse tissue. Hepatocytes are responsible for the maintenance of blood glucose levels by glycogenolysis and gluconeogenesis in response to pancreatic hormone stimulation. The liver also participates in the processing of lipids and cholesterol, bile, urea, and toxins. Adipose tissue stores lipids under the influence of insulin and releases them under the influence of epinephrine. Skeletal muscle metabolism differs based on the current activity level and fiber type. Resting muscle conserves carbohydrates in glycogen stores and uses free fatty acids from the bloodstream. Active muscle may use anaerobic metabolism, oxidative phosphorylation of glucose, direct phosphorylation from creatine phosphate, or fatty acid oxidation, depending on fiber type and Cardiac muscle uses fatty acid oxidation in both the well-fed and The brain and other nervous tissues consume glucose in all metabolic states, except for prolonged fasts, where up to 2 of the brain's fuel may come from ketone bodies. Metabolic rates can be measured using calorimetry, respirometry, consumption tracking, or measurement of blood concentrations of substrates and hormones. Composition of fuel that is actively consumed by the body is estimated by the respiratory quotient (RQ). Body mass regulation is multifactorial with consumption and activity as modifiable factors. The hormones leptin, ghrelin, and orexin, as well as their receptors, play a role in body mass. Long-term changes in body mass result from changes in lipid Changes in consumption or activity must surpass a threshold to cause weight change. The threshold is lower for weight gain than for Body mass can be measured and tracked using the body mass

Answers to Concept Checks

1.  $\Delta G^{\circ'}$  adjusts only for the pH of the environment by fixing it at 7. Temperature and concentrations of all other reagents are still fixed at their values from standard conditions and must be adjusted for if they are not 1 M.
2. The cellular environment has a relatively fixed volume and pressure, which eliminates work from our calculations of internal energy; if  $\Delta U = Q - W$  and  $W = 0$ ,  $\Delta U = Q$ . Spontaneous at high temperatures Spontaneous at low temperatures

1. ATP hydrolysis yields about 30 kJ of energy,

which can be harnessed to drive other reactions forward. This may either allow a nonspontaneous reaction to occur or increase the rate of a spontaneous reaction. 2. ATP is an intermediate-energy storage molecule and is not energetically dense. The high-energy bonds in ATP and the presence of a significant charge make it an inefficient molecule to pack into a small space. Long-term storage molecules are characterized by energy density and stable, nonrepulsive bonds, primarily seen in lipids. 3.  $\text{cAMP} + \text{H}_2\text{O} \rightarrow \text{AMP} + \text{P}_i$   $\text{ADP} + \text{H}_2\text{O} \rightarrow \text{ATP} + \text{P}_i$   $\text{ATP} + \text{H}_2\text{O} \rightarrow \text{cAMP} + 2\text{P}_i$   $\text{ATP} + \text{H}_2\text{O} \rightarrow \text{ADP} + \text{P}_i$  1. Analyzing half-reactions can help to determine the number of electrons being transferred. This type of analysis also facilitates balancing equations and the determination of electrochemical potential if reduction potentials are provided. Glycolysis, fermentation, citric acid cycle, electron transport chain Pentose phosphate pathway, lipid biosynthesis, bleach formation, oxidative Electron transport chain

Electron transport chain 1. Any excitable cell is maintained in a state of disequilibrium. Classic examples include muscle tissue and neurons. In addition, cell volume and membrane transport are regulated by the action of the sodium–potassium pump, which can maintain a stable disequilibrium state in 2. Cells that rely solely on anaerobic respiration are the least adaptable to different energy sources. Therefore, red blood cells are the least flexible during periods of prolonged starvation and stay reliant on glucose. 3. During the postabsorptive state, there is the greatest decrease in insulin levels. The concentrations of the counterregulatory hormones (glucagon, cortisol, epinephrine, norepinephrine, and growth hormone) begin to rise. 1. Insulin promotes glucose uptake by adipose tissue and muscle, glucose utilization in muscle cells, and macromolecule storage (glycogenesis, lipogenesis). Glucagon increases blood glucose levels by promoting glycogenolysis, gluconeogenesis, lipolysis, and ketogenesis. Cortisol increases lipolysis and amino acid mobilization, while decreasing glucose uptake in certain tissues and enhancing the activity of other counterregulatory hormones. Catecholamines increase glycogenolysis in muscle and liver and lipolysis in adipose tissue. Thyroid hormones increase basic metabolic rate and potentiate the activity of other 2. Thyroid storm presents with hyperthermia (high temperature), tachycardia



(fast heart rate), hypertension (high blood pressure), and tachypnea (high respiratory rate). 1. The preferred fuel for most cells in the well-fed state is glucose; the exception is cardiac muscle, which prefers fatty acids. 2. The brain consumes the greatest amount of glucose relative to its percentage of body mass. 3. The liver is responsible for maintaining a steady-state concentration of glucose in the blood through glucose uptake and storage, glycogenolysis, and gluconeogenesis. The liver also participates in cholesterol and fat metabolism, the urea cycle, bile synthesis, and the detoxification of foreign substances. 1. As a person begins to exercise, the proportion of energy derived from glucose increases. This transition to almost exclusively carbohydrate metabolism will cause the respiratory quotient to approach 1. 2. False; energy expenditure, genetics, socioeconomic status, geography, and other hormones also play a role in body mass regulation. 3. True; the threshold is lower for uncompensated weight gain than it is for uncompensated weight loss. Therefore, it is easier to surpass this threshold and gain weight than to lose weight. 4. The methods described in the text include chemical analysis, which is objective and can quantify specific metabolic substrates, products, and enzymes; calorimetry, which is most accurate for basal metabolic rate but also most expensive; respirometry, which provides basic information about fuel sources; and caloric analysis at constant weight (food and exercise logs), which is the least invasive. Any of these answers could be defended. Science Mastery Assessment In a closed biological system, enthalpy, heat, and internal energy are all directly related because there is no change in pressure or volume. Because pressure and volume are fixed, work cannot be done, thus (C) is correct. To solve this question, we can use the equation  $\Delta G = \Delta G^\circ + RT \ln Q$ .  $Q$ , the reaction quotient, is  $\frac{[B][C]^2}{[A]}$  for this reaction. Plugging in the variables, we get  $\Delta G = \Delta G^\circ + RT \ln Q$ . Because both  $R$  and  $T$  are positive, and natural log values being greater than 0, we know that  $\Delta G$  must be negative and therefore lower than the original value. A negative  $\Delta G$  corresponds to a spontaneous reaction. The hydrolysis of ATP is energetically favorable because there are repulsive negative charges that are relieved when hydrolyzed, and the new compounds are stabilized by resonance. This is true of both ATP and ADP. Some of the other answer choices

are tempting, though. In (A), ATP hydrolysis relies on pH because a protonated ATP molecule contains less negative charge and therefore experiences less repulsive force. For (B), the energy released by one mole of creatine phosphate upon hydrolysis is not sufficient to phosphorylate two moles of ADP according to Table 12.1; creatine phosphate donates one phosphate group to a molecule of ADP, so one mole of creatine phosphate will phosphorylate one mole of ADP. For (D), the removal of two phosphate groups from ATP yields AMP, not cyclic AMP. Reduction is a gain of electrons, which eliminates (B) because it is an oxidation reaction. NADPH, (C), is a product of the pentose phosphate pathway. Ubiquinone, (D), transfers electrons during the course of the electron transport chain, but is not the final electron acceptor. This title belongs to oxygen. In order to transport electrons, electron carriers like flavoproteins must be able to exist in a stable oxidized state and a stable reduced form. ATP can be dephosphorylated but is generally not oxidized or reduced. Regulatory enzymes may also be phosphorylated or dephosphorylated but are not generally oxidized or reduced.  $\Delta G = 0 + RT \ln [10 \times 10^3] / [10 \times 10^3] = RT \ln 104 = 4RT \ln 10$ . Skipping a single meal is not a prolonged fast. However, the increase in hormones that promote gluconeogenesis and glycogenolysis indicates that the absorptive phase has ended. In the well-fed state, the liver runs off of glucose and amino acids, the brain and adipose tissue run off of glucose, and cardiac muscle runs off of fatty acids. Only (D) correctly pairs the tissue with its energy source. Hormonal controls are coordinated to regulate the metabolic activity of the entire organism, while allosteric controls can be local or systemic. The modification of the enzymes of glycogen metabolism by insulin and glucagon is either through phosphorylation or dephosphorylation, both of which modify covalent bonds. Adipose tissue and resting skeletal muscle require insulin for glucose uptake. Active skeletal muscle, (A), uses creatine phosphate and glycogen (regulated by epinephrine and AMP) to maintain its energy requirements. Short-term glucocorticoid exposure causes a release of glucose and the hydrolysis of fats from adipocytes. However, if this glucose is not used for metabolism, it causes an increase in glucose level which promotes fat storage. The net result is the release of glucose from the

liver to be converted into lipids in the adipose tissue under insulin stimulation. The brain uses aerobic metabolism of glucose exclusively and therefore is very sensitive to oxygen levels. The extremely high oxygen requirement of the brain (20% of the body's oxygen content) relative to its size (2% of total body weight) implies that brain is the most sensitive organ to oxygen. The respiratory quotient (RQ) gives an indication of the primary fuel being utilized. An RQ around 0.7 indicates lipid metabolism, 0.8–0.9 indicates amino acid metabolism, (D), and 1.0 indicates carbohydrate metabolism, (A). Nucleic acids do not contribute significantly to the respiratory quotient. Leptin acts to decrease appetite by inhibiting the production of orexin. Orexin is also associated with alertness, so decreasing the level of orexin in the body is expected to cause drowsiness. Even without this information, the answer should be apparent because the body tends to maintain an energy balance. If consumption decreases, energy expenditures are expected to decrease as well. ATP stores are turned over about 1,000 times per day, not 10,000. A prolonged fast is characterized by an increase in glucagon, which accomplishes its cellular activity by phosphorylating and dephosphorylating metabolic enzymes. Glycogen storage, (B), is then halted, but this requires enzyme regulation by glucagon to occur. Later in the postabsorptive state, protein breakdown, (C), begins. Eventually, in starvation, ketone bodies, (A), are used by the brain for its main energy source. Consult your online resources for additional practice.

Equations to Remember (12.1) Gibbs free energy:  $\Delta G = \Delta H - T\Delta S$  (12.2) Modified standard state:  $\Delta G = \Delta G^\circ + RT \ln(Q)$  (12.3) Respiratory quotient:  $RQ = \frac{\text{CO}_2 \text{ produced}}{\text{O}_2 \text{ consumed}}$  (12.4) Body mass index:  $BMI = \frac{\text{mass}}{\text{height}^2}$

Biochemistry Chapter 9 Carbohydrate Metabolism I  
 Biochemistry Chapter 10 Carbohydrate Metabolism II  
 Biochemistry Chapter 11 Lipid and Amino Acid Metabolism  
 Biology Chapter 5 The Endocrine System  
 General Chemistry Chapter 11  
 Physics and Math Chapter 3 Absolute configuration–The nomenclature system used for the three-dimensional arrangement of atoms in isomers; the most common systems are D/L and (R)/(S). Acetal–A carbon atom bonded to an alkyl group, two OR groups, and a hydrogen atom. Acetyl-CoA–An important metabolic intermediate that links glycolysis and  $\beta$ -oxidation to the citric acid cycle; can also be converted into ketone bodies. Activation–The conversion of a biomolecule to its

active or usable form, such as activation of tRNA with an amino acid or activation of a fatty acid with CoA to form fatty acyl-CoA. Activation energy–The energy required to change the state of a molecule or group of molecules to the transition state; the energy required for a reaction. Active site–The catalytically active portion of an enzyme. Active transport–The movement of a molecule against its concentration gradient with energy investment; primary active transport uses ATP, whereas secondary active transport uses a favorable transport gradient of a. Activity–The measure of the catalytic activity of an enzyme, also called the velocity or rate. It is often measured as a  $v_{max}$  and may be analyzed after Activity analysis–The determination of the enzymatic activity of an isolated protein by interaction with a substrate; usually colorimetric in nature. Adenosine triphosphate (ATP)–The primary energy molecule of the body; it releases energy by breaking the bond with the terminal phosphate to form ADP and inorganic phosphate. Adipocyte–A cell specializing in fat storage. Aerobic respiration–A collection of energy-producing metabolic processes that require oxygen, including the citric acid cycle, electron transport chain, and oxidative phosphorylation. Agglutination–Clumping of particles caused by the binding of antibody to. Aldose–A sugar in which the highest-order functional group is an aldehyde; can be categorized by number of carbons (triose, tetrose, pentose, hexose, Allosteric enzymes–Enzymes that experience changes in their conformation as a result of interactions at sites other than the active site, called allosteric sites; conformational changes may increase or decrease  $\alpha$ -Helix–An element of secondary structure, marked by clockwise coiling of amino acids around a central axis. Alternative splicing–The production of multiple different but related mRNA molecules from a single primary transcript of hnRNA. Amino acid–A dipolar compound containing an amino group ( $NH_2$ ) and a carboxyl group ( $COOH$ ). Amphipathic–Having both hydrophilic and hydrophobic regions. Amphoteric–The ability to act as an acid or base. Amplification–Increased transcription (and translation) of a gene in response to hormones, growth factors, and other intracellular conditions. Anabolism–The series of metabolic processes that result in the consumption of energy and the synthesis of molecules. Anaerobic

respiration–The series of energy-producing metabolic processes that do not require oxygen, including glycolysis and fermentation. Anomers–A subtype of epimers in which the chiral carbon with inverted configuration was the carbonyl carbon (anomeric carbon). Antibody–A specialized protein molecule produced by lymphocytes for interaction with antigens; antibodies consist of two heavy and two light chains that have constant and variable regions. Antibodies, also called immunoglobulins, are mediators of the immune response. Anticodon–A three-nucleotide sequence on a tRNA molecule that pairs with a corresponding mRNA codon during translation. Antigen–The region of a molecule that interacts with an antibody; in most cases, antigens are proteins. Apoenzyme–An enzyme devoid of the prosthetic group, coenzyme, or cofactor necessary for normal activity. Apolipoproteins–Protein molecules responsible for the interaction of lipoproteins with cells and the transfer of lipid molecules between lipoproteins; also called apoproteins. Aromaticity–The ability of a molecule to delocalize  $\pi$  electrons around a conjugated ring, creating exceptional stability. Basal metabolic rate–The amount of energy consumed in a given period of time by a resting organism.  $\beta$ -Oxidation–The catabolism of fatty acids to acetyl-CoA.  $\beta$ -Pleated sheet–An element of secondary structure, marked by peptide chains lying alongside one another, forming rows or strands. Bile–A mixture of salts, pigments, and cholesterol that acts to emulsify lipids in the small intestine. Binding proteins–Proteins that transport or sequester molecules by binding to them. Binding proteins have affinity curves for their molecules of interest. Bioenergetics–Biochemistry of the energy involved in bond interactions in Biosignaling–The process by which cells receive and act on messages. Bradford protein assay–A colorimetric method of determining the concentration of protein in an isolate against a protein standard; relies on a transition of absorption between bound and unbound Coomassie Brilliant Cahn–Ingold–Prelog system–The system used to name isomers ((E) vs. (Z); (R) vs. (S)), based on the atomic numbers of their substituents and their orientation in three-dimensional space. Calorimeter–A device for measuring the heat change during the course of a Carboxylation–The addition of carboxylic acid groups to a molecule. Carotenoids–A group of

molecules that are tetraterpenes (made of eight Catabolism–The series of metabolic processes that result in the release of energy and the breakdown of molecules. Catalyst–A substance or enzyme that increases the rate of a reaction by lowering activation energy. Catalysts are not consumed during the catalyzed Catalytic efficiency–The ratio of  $k_{cat}/K_m$ . Catalytic efficiency is directly related to efficiency of enzyme function. Catecholamines–Mediators of the sympathetic nervous system and adrenal gland; include epinephrine and norepinephrine. Cell adhesion molecules–Specialized structural proteins that are involved in cell–cell junctions as well as transient cellular interactions; common cell adhesion molecules are cadherins, integrins, and selectins. Cellulose–A homopolysaccharide of glucose, and the main structural component of plants. Cellulose is indigestible for humans. Central dogma of molecular biology–The major steps in the transfer of genetic information, from transcription of DNA to RNA to translation of that RNA to protein. Centrifugation–The process of separating components on the basis of their density and resistance to flow by spinning a sample at very high speeds; the highest density materials form a solid pellet and the lowest density materials remain in the supernatant (liquid portion). Centromere–The area of a chromosome where sister chromatids are joined; it is also the point of attachment to the spindle fiber during mitosis and Ceramide–The simplest sphingolipid, with a single hydrogen as its head Cerebroside–A sphingolipid containing a carbohydrate as a head group. Chaperones–Proteins that assist in protein folding during posttranslational Chargaff's rule–DNA from any source should have a 1:1 ratio of pyrimidine to purine bases, with adenine equal to thymine and cytosine equal to Chemiosmotic coupling–The utilization of the proton-motive force generated by the electron transport chain to drive ATP synthesis in oxidative Chiral–Describes a molecule with a nonsuperimposable mirror image. Chiral center–A carbon atom bonded to four different substituents; a chiral compound must have at least one chiral center. Cholesterol–A molecule containing four linked aromatic rings; cholesterol provides both fluidity and stability to cell membranes and is the precursor for steroid hormones. Chromatid–Each of the two chromosomal strands formed by DNA replication in the S phase of the cell cycle, held together

by the centromere. Identical pairs of chromatids are referred to as sister chromatids.

**Chromatography**–The process of separating molecules by their interactions with a stationary phase and a mobile phase; most chromatographic methods rely on the chemical similarity of molecules, with the exception of size-

**Chromosome**–A filamentous body found within the nucleus of a eukaryotic cell or nucleoid region of a prokaryotic cell, composed of DNA.

**Citric acid cycle**–A metabolic pathway that produces GTP, energy carriers, and carbon dioxide as it burns acetyl-CoA; also called the Krebs cycle or tricarboxylic acid (TCA) cycle; can share intermediates with many other metabolic processes including fatty acid and cholesterol synthesis, gluconeogenesis, amino acid metabolism, and others.

**Closed system**–A system capable of exchanging energy, but not matter, with

**Coding strand**–The strand of DNA that is not used as a template during transcription; also called the sense strand.

**Codon**–A three-nucleotide sequence in an mRNA molecule that pairs with an appropriate tRNA anticodon during translation.

**Coenzyme**–An organic molecule that helps an enzyme carry out its

**Cofactor**–An inorganic molecule or ion that helps an enzyme carry out its

**Colligative properties**–Physical properties that change according to the concentration of solutes, but not their identity. Colligative properties include vapor pressure depression, boiling point elevation, freezing point depression, and osmotic pressure.

**Colloid**–A mixture composed of large molecules of one substance suspended within another substance.

**Competitive inhibition**–A decrease in enzyme activity that results from the interaction of an inhibitor with the active site of an enzyme; competitive inhibition can be overcome by addition of excess substrate.

**Condensation reaction**–A reaction in which the removal of a water molecule accompanies the formation of a bond; also called a dehydration

**Conformational coupling**–A less-accepted mechanism of ATP synthase activity in which the protons cause a conformational change that releases ATP from ATP synthase.

**Conjugated protein**–A protein that derives part of its function from covalently attached molecules (prosthetic groups).

**Cooperativity**–The interaction between subunits of a multi-subunit protein in which binding of substrate to one subunit increases the affinity of other subunits for the substrate; unbinding of substrate from one unit

decreases the affinity of other subunits for the substrate. Corepressor–A species that binds with a repressor, allowing the complex to bind to the operator region of an operon, stopping transcription of the Cristae–The infoldings of the inner mitochondrial membrane that increase the surface area available for electron transport chain complexes. C-terminus–The free carboxyl end of a polypeptide. Dalton (Da)–Molar mass unit used for protein molecular weight. One amino acid weighs approximately 100 Da, or 100 g Degeneracy–A characteristic of the genetic code, in which more than one codon can specify a single amino acid. Denaturation–The loss of secondary, tertiary, or quaternary structure in a protein, leading to loss of function. Deoxyribonucleic acid (DNA)–A nucleic acid found exclusively in the nucleus that codes for all of the genes necessary for life; transcribed to mRNA and always read 5' to 3'. Desmosomes–Cell–cell junctions that anchor layers of epithelial cells to one Diastereomers–Compounds with at least one—but not all—chiral carbons in inverted configurations; differ in physical properties. Diprotic–Containing two hydrogens (acid), or being able to pick up two Disulfide bond–A covalent interaction between the SH groups of two cysteine residues; an element of tertiary and quaternary structure. Edman degradation–A stepwise process for determining the amino acid sequence in an isolated protein. Electrochemical gradient–An uneven separation of ions across a biological membrane, resulting in potential energy. Electrophoresis–The process of separating compounds on the basis of size and charge using a porous gel and an electric field; protein electrophoresis generally uses polyacrylamide, while nucleic acid electrophoresis generally Elongation–The three-step cycle that is repeated for each amino acid being added to a protein during translation. Emulsification–The mixing of two normally immiscible liquids. Enantiomers–Compounds that are nonsuperimposable mirror images; have the same physical and chemical properties except for rotation of plane- polarized light and interaction with a chiral environment. Endocytosis–The transport of molecules into a cell through the invagination of cell membrane and the formation of a vesicle; phagocytosis is the endocytosis of solid, pinocytosis is the endocytosis of liquid. Endothermic reaction–A reaction that requires



heat (positive  $\Delta H$ ). Enhancer–A collection of several response elements that allow for the control of one gene’s expression by multiple signals. Enthalpy–The overall change in heat of a system during a reaction. Entropy–The disorder of a system; systems in which entropy is increased are Enzyme–A biological molecule with catalytic activity; includes many proteins and some RNA molecules. Enzymes are specified for target Enzyme-linked receptor–A transmembrane protein that displays catalytic activity in response to ligand binding. Epimers–A subtype of diastereomers that differ in absolute configuration at exactly one chiral carbon. Euchromatin–The looser, less-dense collections of DNA that appear light colored under a microscope; transcriptionally active. Exocytosis–The transport of molecules out of a cell by release from a transport vesicle; the vesicle fuses to the cell membrane during secretion. Exon–A portion of hnRNA that is spliced with other exons to form mature Exothermic reaction–A reaction that releases heat (negative  $\Delta H$ ). Facilitated diffusion–The movement of solute molecules across the cell membrane down their concentration gradients through a transport protein or channel; used for ions and large or polar molecules. Fatty acid–A monocarboxylic acid without additional substituents; fatty acids may be saturated (all single bonds) or unsaturated (contain at least one double bond); natural fatty acids are in the cis conformation. Feedback inhibition–The inhibition of an enzyme by its product (or a product further down a metabolic pathway); used to maintain homeostasis. Feed-forward activation–The stimulation of an enzyme by an intermediate that precedes the enzyme in a metabolic pathway. Fermentation–The conversion of pyruvate to either ethanol and carbon dioxide (yeast) or lactic acid (animal cells); does not require oxygen. Fibrous protein–A protein composed of long sheets or strands, such as Fischer projection–A method of drawing organic molecules in which horizontal lines are coming out of the page (wedges) and vertical lines are going into the page (dashes). Flavin adenine dinucleotide (FAD)–An energy carrier that accepts electrons and feeds them into the electron transport chain. Flavoprotein–A protein bonded to FAD. Fluid mosaic model–The representation of the plasma membrane as a dynamic phospholipid bilayer with interactions of cholesterol, proteins, and Frameshift mutation–A

change in DNA in which the reading frame of the codons in mRNA is shifted due to the insertion or deletion of nucleotides (other than in multiples of three). Fructose–A monosaccharide found predominantly in fruit and honey. Furanose–A five-membered ring sugar. G protein-coupled receptors–A special class of membrane receptors with an associated GTP-binding protein; activation of a G protein-coupled receptor involves dissociation and GTP hydrolysis. Galactose–A monosaccharide found predominantly in dairy. Ganglioside–A sphingolipid with a head group containing an oligosaccharide and one or more N-acetylneuraminic acid (NANA) Gap junctions–Cell-cell junctions that allow for the passage of small molecules between adjacent cells. Gene–A unit of DNA that encodes a specific protein or RNA molecule. Globoside–A sphingolipid with multiple carbohydrate groups attached as a Globular protein–A protein with a roughly spherical structure, such as Glucagon–A mediator of glucose release that is secreted by pancreatic  $\alpha$ - cells; rises in response to low blood glucose. Glucogenic–Describes amino acids that can be converted into intermediates that feed into gluconeogenesis; all except leucine and lysine. Gluconeogenesis–The production of glucose from other biomolecules; carried out by the liver and kidney. Glucose–The primary monosaccharide used for fuel by all cells of the body, with the formula  $C_6H_{12}O_6$ . Glycerol–A three-carbon alcohol that serves as the backbone for glycerophospholipids, sphingolipids, and triacylglycerols. Glycerophospholipid–Also referred to as a phosphoglyceride; a lipid containing a glycerol backbone with a phosphate group, bonded by ester linkages to two fatty acids. Glycogen–A branched polymer of glucose that represents a storage form of Glycogenesis–The synthesis of glycogen granules. Glycogenolysis–The breakdown of glycogen granules. Glycolysis–The breakdown of glucose to two molecules of pyruvate, with the formation of energy carriers (NADH); occurs under both aerobic and Glycosidic linkage–The bond between the anomeric carbon of a sugar and Glycosphingolipid–A sphingolipid with a head group composed of sugars; includes cerebrosides and globosides. Glycosylation–The addition of sugars to a molecule. Haworth projection–A method for depicting cyclic sugars as planar rings with OH groups sticking up or down from the plane of the sugar. Hemiacetal–A

carbon atom bonded to an alkyl group, an OR group, an OH group, and a hydrogen.

Hemiketal–A carbon atom bonded to two alkyl groups, an OR group, and an OH group.

Hess's law–A relationship that states that the total change in any state function is the same regardless of the path taken or the number of steps, and is equal to the difference between initial and final values of that state

Heterochromatin–The tightly coiled DNA that appears dark colored under a microscope; transcriptionally inactive.

Heterogeneous nuclear RNA (hnRNA)–The precursor to processed mRNA; converted to mRNA by adding a poly-A tail and 5' cap and splicing

Hill's coefficient–A quantitative measure of cooperative binding effects in

Histone–A structural protein about which DNA is coiled in eukaryotic cells. Histone association with DNA can be altered by acetylation of histone proteins or methylation of the DNA strand.

Holoenzyme–An enzyme that has already bound a required prosthetic group, coenzyme, or cofactor.

Homeostasis–The stable internal state of an organism; homeostasis is not synonymous with equilibrium.

Homogenization–The process of breaking cell membranes and creating a uniform mixture of cell components for further separation; may be accomplished chemically or physically.

Hormone-sensitive lipase–The enzyme responsible for the mobilization of fatty acids from adipocytes; responds to a decrease in insulin levels.

Hückel's rule–One condition for aromaticity, which states the compound must have  $4n + 2$  (where  $n$  is any integer)  $\pi$  electrons.

Hybridization–In research techniques involving DNA, the joining of complementary base pair sequences.

Hydrolase–An enzyme that catalyzes the cleavage of a molecule with the addition of water.

Hydrolysis–Breaking a covalent bond with the assistance of a water

Hydrophilic–Being attracted to water; describes polar and charged compounds and those that can participate in hydrogen bonding.

Hydrophobic–Being repelled by water; describes nonpolar, uncharged compounds (usually lipids or certain R groups of amino acids).

Hypertonic–A solution that has a greater concentration than the one to which it is being compared.

Hypotonic–A solution that has a lower concentration than the one to which it is being compared.

Induced fit model–The best-supported of the most prominent theories of enzyme specificity; states that the enzyme and substrate experience a change in conformation

during binding to increase complementarity. Usually contrasted with the lock and key theory.

Inducible system–An operon that requires an inducer to remove a repressor protein from the operator site to begin transcription of the relevant gene.

Initiation–The start of translation, in which the small subunit of the ribosome binds to the mRNA molecule, and the first tRNA (methionine or N-formylmethionine) is bound to the start codon (AUG).

Insulin–The primary mediator of carbohydrate metabolism that is secreted by pancreatic  $\beta$ -cells; rises in response to high blood glucose.

Internal energy–The sum of all of the different interactions between and within atoms in a system; vibration, rotation, linear motion, and stored chemical energies all contribute.

Intron–A portion of hnRNA that is spliced out to form mRNA; remains in the nucleus during processing.

Ion channels–Proteins that form a pore through the membrane in which they are embedded.

Irreversible inhibition–A decrease in enzyme activity that results from the interaction of an inhibitor that binds permanently at either the active site or an allosteric site; in laboratory settings, irreversible inhibitors are sometimes called suicide substrates.

Isoelectric focusing–A specialized method of separating proteins by their isoelectric point using electrophoresis; the gel is modified to possess a pH Isoelectric point (pI)–The pH at which an amino acid is predominantly in Isoform–A slightly different version of the same protein, often specific to a Isomerase–An enzyme that catalyzes the constitutional or stereochemical rearrangement of a molecule.

Isotonic–A solution that has the same concentration as the one to which it is being compared.

Jacob–Monod model–The description of the structure and function of operons in prokaryotes, in which operons have structural genes, an operator site, a promoter site, and a regulator gene.

$k_{cat}$ –Rate of catalytic conversion of substrate. This value gives the number of substrate molecules turned over per enzyme molecule per second.

Ketal–A carbon atom bonded to two alkyl groups and two OR groups.

Ketogenesis–The synthesis of ketone bodies from the metabolic products of  $\beta$ -oxidation or amino acid metabolism; occurs under conditions of Ketogenic–Describes amino acids that can be converted into ketone bodies.

Ketolysis–The breakdown of ketone bodies for use as acetyl-CoA.

Ketose–A sugar in which the highest-order functional group is a ketone; can

be categorized by number of carbons (triose, tetrose, pentose, hexose, and so Kinase–A specific transferase protein that catalyzes the movement of a phosphate group, generally from ATP, to a molecule of interest.  $K_m$ –The concentration of substrate at which an enzyme runs at half its maximal velocity; a measure of enzyme affinity (the higher the  $K_m$ , the lower Lactose–A disaccharide composed of glucose and galactose. Lariat–The lasso-shaped structure formed during the removal of introns in Ligase–An enzyme that catalyzes the synthesis of large polymeric biomolecules, most commonly nucleic acids. Lipid–A molecule that is insoluble in water and soluble in nonpolar organic Lipoprotein–The transport mechanism for lipids within the circulatory and lymphatic systems; includes chylomicrons and VLDL, which transport triacylglycerols; and HDL, IDL, and LDL, which transport cholesterol and Lock and key theory–One of the two most prominent theories of enzyme specificity; states that the enzyme and the substrate have a static but complementary state. Less supported than the induced fit model. Lyase–An enzyme that catalyzes the cleavage or synthesis of a molecule without the addition or loss of water. Maltose–A disaccharide composed of two glucose molecules. Matrix–The contents of the inner mitochondrial membrane; includes soluble enzymes of the electron transport chain and mitochondrial DNA. Membrane–In cell biology, a double layer of phospholipids and proteins that forms the boundaries of cells and organelles within cells. Membrane receptors–Transmembrane protein molecules that act enzymatically or as ion channels to participate in signal transduction. Messenger RNA (mRNA)–The strand of RNA formed after transcription of DNA; transfers to the cytoplasm to be translated. Micelle–A collection of fatty acid or phospholipid molecules oriented to minimize free energy through hydrophobic and hydrophilic interactions; generally a sphere with a hydrophobic core and hydrophilic exterior. Migration velocity–the velocity at which a compound moves through a gel Missense mutation–A mutation in which one amino acid is substituted for by a different amino acid. Mitochondria–The organelle responsible for aerobic respiration, generating ATP from the breakdown products of other biomolecules and energy carriers reduced in various metabolic pathways; contains an inner and outer Mixed inhibition–A decrease in enzyme activity that

results from the interaction of an inhibitor with an allosteric site; mixed inhibitors bind to free enzyme and to substrate-bound enzyme with different affinities. They cannot be overcome by addition of substrate and impact both  $K_m$  and  $v_{max}$ . Molten globules–Intermediate states in the folding of a protein. Monocistronic–The coding pattern of eukaryotes in which one mRNA molecule codes for only one protein. Monoprotic–Containing only one hydrogen (acid), or being able to pick up only one hydrogen (base). Monosaccharide–A single sugar monomer; common examples are glucose, galactose, and fructose. Motor proteins–Proteins that are involved in cell motility through interactions with structural proteins; motor proteins have ATPase activity and include myosin, kinesin, and dynein. Mutarotation–The rapid interconversion between different anomers of a sugar. Negative control–In prokaryotic genetics, an operon that requires the binding of a protein to decrease transcription. Nicotinamide adenine dinucleotide (NAD<sup>+</sup>)–An energy carrier that accepts electrons and feeds them into the electron transport chain. Nicotinamide adenine dinucleotide phosphate (NADP<sup>+</sup>)–An electron donor produced in the pentose phosphate pathway that is involved in biosynthesis, oxidative stress, and immune function. NMR spectroscopy–A method of determining molecular structure that uses the relative position of carbons and hydrogens determined by the relative shielding and spins of electrons observed when molecule is exposed to a magnetic field. Noncompetitive inhibition–A decrease in enzyme activity that results from the interaction of an inhibitor with an allosteric site; noncompetitive inhibitors bind equally well to free enzyme and to substrate-bound enzyme. They cannot be overcome by addition of substrate. Nonsense mutation–A mutation in which a coding codon is changed to a stop codon. Also called a truncation mutation. Nontemplate synthesis–The method of de novo synthesis of lipids and carbohydrates that relies on gene expression and enzyme specificity rather than the genetic template of DNA or RNA. N-terminus–The free amino end of a polypeptide. Nuclear pore–A hole in the nuclear envelope that permits the entrance and exit of substrates. Nucleoside–Molecule composed of a pentose bound to a nitrogenous base at the C-1' position of the sugar. Nucleotide–Molecule composed of one or more phosphate groups bound to the C-5' position of a nucleoside.

Nucleotide excision repair–Method for removing thymine dimers from DNA strands via a cut-and-patch process. Okazaki fragments–Small strands formed on the lagging strand during DNA synthesis due to the unidirectional nature of DNA synthesis. Oncogenes–Mutated genes that cause cancer. Open system–A system capable of exchanging both matter and energy with its surroundings. Operator site–A component of the operon in prokaryotes; a nontranscribable region of DNA that is capable of binding a repressor. Operon–In prokaryotes, a cluster of genes transcribed as a single mRNA that can be regulated by repressors or inducers, depending on the system. Opsonization–The marking of a pathogen by an antibody for later phagocytosis. Origins of replication–Sites at which DNA unwinds to allow replication of new DNA. Generation of new DNA in both directions occurs at origins of replication, resulting in replication forks. Osmosis–The simple diffusion of water. Osmotic pressure–The pressure necessary to counteract the effect of an osmotic gradient against pure water; one of the colligative properties. Oxidative phosphorylation–The transfer of a phosphate group, generally to ATP that is powered by a gradient formed by oxidation–reduction reactions; occurs in the mitochondria. Oxidoreductase–An enzyme that catalyzes an oxidation–reduction reaction, often using an electron carrier as a cofactor. Pancreatic lipase–The primary enzyme involved in the digestion of lipids. Pancreatic proteases–The enzymes that are primarily responsible for the digestion of proteins in the small intestine; they include trypsin, chymotrypsin, and carboxypeptidases A and B, and are secreted as zymogens. Paracellular transport–The transport of materials through the interstitial space without interactions with the cytoplasm or cell membrane. Passive transport–The movement of a molecule down its concentration gradient without energy investment; includes simple and facilitated diffusion and osmosis. Pentose phosphate pathway–A metabolic process that produces NADPH and ribose 5-phosphate for nucleotide synthesis. Peptide–A molecule composed of more than one amino acid residue; can be subdivided into dipeptides (two amino acids), tripeptides (3), oligopeptides (up to 20), and polypeptides (more than 20). Peptide bond–An amide bond between the carboxyl group of one amino acid and the amino group of another amino acid. Phospholipid–A lipid containing a

phosphate and alcohol (glycerol or sphingosine) joined to hydrophobic fatty acid tails.

Phosphorylation–The placement of a phosphate group onto a compound.

pKa–The pH at which half of the of the molecules of a given acid are deprotonated;  $[HA] = [A]$ .

Point mutation–The substitution of one nucleotide for another in DNA.

Polarity–An uneven sharing of electrons in a molecule, creating a slightly positive side and a slightly negative side.

Polycistronic–The coding pattern of prokaryotes, in which one mRNA may code for multiple proteins.

Polymerase chain reaction–An automated process to produce copies of a DNA sequence without use of bacteria for amplification.

Polyprotic–Containing more than one hydrogen (acid), or being able to pick up more than one hydrogen (base).

Polysaccharide–A long chain of monosaccharides linked by glycosidic bonds; can be divided into homopolysaccharides (only one type of monosaccharide is used) and heteropolysaccharides (more than one type of monosaccharide is used).

Positive control–In prokaryotic genetics, an operon that requires the binding of a protein to increase transcription.

Postprandial state–State shortly after eating characterized by increased anabolism and fuel storage. Also referred to as the absorptive or well-fed

Prenylation–The addition of lipid groups to a molecule.

Primary structure–The linear sequence of amino acids in a polypeptide.

Promoter region–The portion of DNA upstream from a gene; contains the TATA box, which is the site where RNA polymerase II binds to start

Prostaglandin–A group of 20-carbon molecules that are unsaturated carboxylic acids derived from arachidonic acid; act as paracrine or autocrine

Prosthetic group–A cofactor or coenzyme that is covalently bonded to a protein to permit its function. Proteins with lipid, carbohydrate, and nucleic acid prosthetic groups are referred to as lipoproteins, glycoproteins, and

Protein–A molecule made up of at least one chain of amino acids joined by

Proteinogenic–The ability of certain (20) amino acids to be integrated into

Proton-motive force–The proton concentration gradient across the inner mitochondrial membrane that is created in the electron transport chain and used in oxidative phosphorylation.

Purine–Nitrogen-containing base found in nucleotides possessing a two-ring structure. The purines are adenine and guanine.

Pyranose–A six-membered ring sugar.



Pyrimidine–Nitrogen-containing base found in nucleotides possessing a one-ring structure. The three pyrimidines are cytosine, thymine, and uracil. Pyruvate–An important metabolic intermediate that can feed into the citric acid cycle, fermentation, or gluconeogenesis. Q cycle–The shuttling of electrons between ubiquinol and ubiquinone in the inner mitochondrial membrane as a part of Complex III's function. Quaternary structure–The interaction between different subunits of a multi-subunit protein; stabilized by R group interactions. Reaction coupling–The tendency of unfavorable biological reactions to occur concurrently with favorable reactions, often catalyzed by a single Reading frame–In translation, the three nucleotides that make up a codon. Recombinant DNA–DNA that has been formed by combining genetic material from multiple sources in a laboratory. Reducing sugar–A sugar that can reduce other compounds and can be detected by Tollens' or Benedict's reagent. Regulator gene–In an operon, the gene that codes for the repressor protein. Release factor–The protein that binds to the stop codon during termination Renaturation–The regaining of the correct secondary, tertiary, and quaternary structure after denaturation of a protein. Replisome–Set of specialized proteins that assist DNA polymerase during Repressible system–An operon that requires a repressor to bind to a corepressor before binding to the operator site to stop transcription of the Repressor–For enzymes, an inhibitor of enzyme action; for operons, a species that binds to the operator region to stop transcription of the relevant Respiratory control–The coordinated regulation of the different aerobic Respiratory quotient–A numerical representation that can be used to determine the most prevalent type of biomolecule being used in metabolism; the ratio of carbon dioxide produced to oxygen consumed. Respirometry–A method of measuring metabolism through the consumption of oxygen. Resting membrane potential–The electrical potential that results from the unequal distribution of charge around the cell membrane; resting membrane potential characterizes a cell that has not been stimulated. Restriction enzyme–Enzymes that recognize palindromic double-stranded DNA sequences and cut through the backbone of the double helix at those Ribonucleic acid (RNA)–A nucleic acid found in both the nucleus and cytoplasm and most

closely linked with transcription and translation, as well as some gene regulation. Ribosomal RNA (rRNA)–The structural and enzymatic RNA found in ribosomes that takes part in translation. Ribosome–Organelle composed of RNA and protein; it translates mRNA during protein synthesis. Ribozyme–An RNA molecule with enzymatic activity. Saponification–The reaction between a fatty acid and a strong base, resulting in a negatively charged fatty acid anion bound to a metal ion; Saturation–The presence or absence of double bonds in a fatty acid; saturated fatty acids have only single bonds, whereas unsaturated fatty acids have at least one double bond. Secondary structure–The local structure of neighboring amino acids; most common are  $\alpha$ -helices and  $\beta$ -pleated sheets. Sequencing–Determining the order of amino acids in a polypeptide, or of nucleotides in a nucleic acid. Shine–Dalgarno sequence–The site of initiation of translation in Shuttle mechanism–A method of functionally transferring a compound across a membrane without the actual molecule crossing; common examples are the glycerol 3-phosphate shuttle and malate–aspartate shuttle. Sialic acid–The common name of N-acetylneuraminic acid (NANA), which is the terminal portion of the head group in a ganglioside. Side chain–The variable component of an amino acid that gives the amino acid its identity and chemical properties; also called an R group. Silent mutation–A mutation in the wobble position of a codon or non-coding DNA that leads to no change in the protein produced during Simple diffusion–The movement of solute molecules through the cell membrane down their concentration gradients without a transport protein; used for small, nonpolar, lipophilic molecules and water. Single-stranded DNA-binding protein–Proteins that bind to unraveled DNA strands to prevent reassociation of DNA or degradation of DNA during replication events. Small nuclear ribonucleoproteins (snRNPs)–The protein portion of the Small nuclear RNA (snRNA)–The RNA portion of the spliceosome Sodium–potassium pump–An ATPase that exchanges three sodium cations for two potassium cations; responsible for maintaining cell volume and the resting membrane potential. Solvation layer–The layer of solvent particles that interacts directly with the surface of a dissolved species. Sphingolipid–A lipid containing a sphingosine or sphingoid backbone, bonded to fatty acid tails; include

ceramide, sphingomyelins, glycosphingolipids, and gangliosides. Sphingomyelin–A sphingophospholipid containing a sphingosine backbone and a phosphate head group. Spliceosome–The apparatus used for splicing out introns and bringing exons together during mRNA processing. Starch–A branched polymer of glucose used for energy storage in plants; common examples are amylose and amylopectin. Start codon–The first codon in an mRNA molecule that codes for an amino acid (AUG for methionine or N-formylmethionine). Stereoisomers–Compounds that have the same chemical formula and backbone, differing only in their spatial orientation; also called optical. Steroid–A derivative of cholesterol. Stop codon–The last codon of translation (UAA, UGA, or UAG); release factor binds here, terminating translation. Structural gene–Within an operon, the region that codes for the protein of Structural proteins–Proteins that are involved in the cytoskeleton and extracellular matrix; they are generally fibrous in nature and include collagen, elastin, keratin, actin, and tubulin. Substrate–The molecule upon which an enzyme acts. Substrate-level phosphorylation–The transfer of a phosphate group from a high-energy compound to ATP or another compound; occurs in glycolysis. Sucrose–A disaccharide composed of glucose and fructose. Supercoiling–Wrapping of DNA on itself during replication, characterized by torsional stress and potential for strand breakage. Surfactant–A compound that lowers the surface tension between two solutions, acting as a detergent or emulsifier. TATA box–The site of binding for RNA polymerase II during transcription; named for its high concentration of thymine and adenine bases. Tautomerization–The rearrangement of bonds within a compound, usually by moving a hydrogen and forming a double bond. Telomere–Repeating unit at the end of DNA that protects against the loss of information with repeated DNA replication. Template strand–The strand of DNA that is transcribed to form mRNA; also called the antisense strand. Termination–The end of translation, in which the ribosome finds a stop codon and release factor binds it, allowing the peptide to be freed from the. Terpene–A class of lipids built from isoprene moieties; have carbon groups in multiples of five. Terpenoid–A terpene derivative that has undergone oxygenation or rearrangement of the carbon skeleton.

Tertiary structure–The three-dimensional shape of a polypeptide, stabilized by numerous interactions between R groups. Thyroid hormones–The primary permissive metabolic hormones involved in the regulation of the basal metabolic rate. Tight junctions–Cell-cell junctions that prevent the paracellular transport of materials; tight junctions form a collar around cells and link cells within a Tissue. Titration–A laboratory technique in which a solution of unknown concentration is mixed with a solution of known concentration to determine the unknown concentration. Transcellular transport–The transport of materials through the cell; requires interaction with the cytoplasm and may require transport proteins. Transcription–The production of an mRNA molecule from a strand of DNA. Transcription factors–Proteins that help RNA polymerase II locate and bind to the promoter region of DNA. Transfer RNA (tRNA)–A folded strand of RNA that contains a three- nucleotide anticodon that pairs with an appropriate mRNA codon during translation and is charged with the corresponding amino acid. Transferase–An enzyme that catalyzes the transfer of a functional group. Translation–The production of a protein from an mRNA molecule. Triacylglycerol–A glycerol molecule esterified to three fatty acid molecules; the most common form of fat storage within the body. Uncompetitive inhibition–A decrease in enzyme activity that results from the interaction with an inhibitor at the allosteric site; uncompetitive inhibitors bind only to the substrate-bound enzyme and cannot be overcome by addition of substrate. UV spectroscopy–A method of determining the concentration of protein in an isolate by comparison against a protein standard; relies on the presence of aromatic amino acids. It can also be used with nucleic acids and other van't Hoff factor–The number of particles obtained from a molecule when dissociated in solution. Vitamin–An organic essential coenzyme that assists an enzyme in carrying out its action.  $v_{max}$ –Maximum velocity for a given quantity of enzyme.  $v_{max}$  occurs when the enzyme is fully saturated. Watson-Crick model–This model proposed the structure of DNA as a double stranded helix. Wax–A high-melting point lipid composed of a very long chain alcohol and a very long chain fatty acid. Wobble–The third nucleotide of a codon that often plays no role in specifying an amino acid; an evolutionary development designed to protect

X-ray crystallography—A method of determining molecular structure using apparent bond angles and diffraction and refraction of X-rays. Zwitterion—A molecule that contains charges, but is neutral overall. Most often used to describe amino acids. Zymogen—An enzyme that is secreted in an inactive form and must be activated by cleavage; common examples are digestive enzymes. Note: Material in figures or tables is indicated by italic f or t after the page number. A (adenine), 198t, 200, 232 Abasic site, 221, 234 ABO blood typing, 166 Absolute configuration, 134 Absorption, lipid metabolism, 415f, 416 Absorptive state, 463–464, 483 ACE (angiotensin-converting enzyme) inhibitors, 49–50 Acetaldehyde dehydrogenase, 379 Acetylation, histone, 277, 277f citric acid cycle, 381, 382 methods of forming, 376–380, 399 pyruvate dehydrogenase, 345, 346 Acetyl-CoA carboxylase, 424, 425 Acetyl-CoA shuttling, 425 Acetylsalicylic acid, 70 Acid-base chemistry, 16–20, 34–35 Aconitase, 382, 400 Actin, 91, 113 Action potential, sinoatrial node, 96f Activated tRNA, 252–253 Activation domain, 275 Activation energy, 52–53 Active muscle, metabolism, 475, 484 Active site, 54, 73 Active transport, 308, 311, 311f, 312t Adenine (A), 198t, 200, 232 Adenosine diphosphate (ADP) DNA structure, 196 respiratory control, 398 Adenosine monophosphate (AMP), 460 Adenosine triphosphatases (ATPases), 91, 92f Adenosine triphosphate (ATP) bioenergetics, 458–461, 482 DNA structure, 196, 197f energy carrier, 459–460 hydrolysis and coupling, 460, 482 phosphoryl group transfers, 460, 482 Adenosine triphosphate (ATP) synthase chemiosmotic coupling, 396–397 proton-motive force, 394, 401 Adenosine triphosphate (ATP) yield, citric acid cycle, 384–385, 387, 401 Adenylate cyclase, 97, 98, 114 Adipocytes, 176, 182 Adipose tissue, metabolism, 474, 484 ADP. See Adenosine diphosphate Adrenal glands, 471 Adrenaline, 471, 471f Adrenaline rush, 471 Aerobic respiration, 369–406 acetyl-CoA, 376–380, 399 electron transport chain, 388–396, 400–401 oxidative phosphorylation, 396–398, 401 reactions of citric acid cycle, 381–387, 400 Affinity chromatography, 105, 114 Agarose gel, 226, 235 Alanine, 9, 14t, 268–269 Alanine aminotransferase, 353f, 354 acetyl-CoA formation, 379 Alcohol dehydrogenase, 379 Aldehydes, 130, 139f Alditol, 142, 150 Aldolase B, 344, 360 Aldonic acids, 140, 150 Aldoses, 130, 142, 149 Allosteric activators, 70 Allosteric effects, 29 Allosteric

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The mist is lifting slowly I can see the way ahead And I've left behind the empty streets That once inspired my life And the strength of the emotion Is like thunder in the air 'Cos the promise that we made each other Haunts me to the end The secret of your beauty And the mystery of your soul I've been searching for in everyone I meet And the times I've been mistaken It's impossible to say And the grass is growing Underneath our feet The words that I remember From my childhood still are true That there's none so blind As those who will not see And to those who lack the courage And say it's dangerous to try Well they just don't know That love eternal will not be denied I know you're out there somewhere I know you're out there somewhere Somewhere you can hear my voice I know I'll find you somehow I know I'll find you somehow And somehow I'll return again to you

The Moody Blues Are you a gutless wonder - or a Renegade Mind? Monuments put from pen to paper, Turns me into a gutless wonder, And if you tolerate this, Then your children will be next. Gravity keeps my head down, Or is it maybe shame ... Manic Street Preachers Rise like lions after slumber In unvanquishable number. Shake your chains to earth like dew Which in sleep have fallen on you. Ye are many - they are few. 'I'm thinking' - Oh, but are you? The Pushbacker sting 'Covid': The calculated catastrophe There is no 'virus' Sequence of deceit War on your mind We must have it? So what is it? Who controls the Cult? Cowan-Kaufman-Morell Statement on Virus Isolation I'm thinking' - Oh, but are you? French-born philosopher, mathematician and scientist René Descartes became famous for his statement in Latin in the 17th century which translates into English as: 'I think, therefore I am.' On the face of it that is true. Thought reflects perception and perception leads to both behaviour and self-identity. In that sense thinking the only route to perception? Clearly, as we shall see, 'we' are not always the source of 'our' perception, indeed with regard to humanity as a whole this is rarely the case; and thinking is far from the only means of perception. Thought is the village idiot compared with other expressions of consciousness that we all have the potential to access and tap into. This has to be true when we are those other expressions of consciousness which are infinite in nature. We have forgotten this, or, more to the point, been manipulated to These are not just the esoteric

musings of the navel. The whole foundation of human control and oppression is control of perception. Once perception is hijacked then so is behaviour which is dictated by perception. Collective perception becomes collective behaviour and collective behaviour is what we call human society. Perception is all and those behind human control know that which is why perception is the target 24/7 of the psychopathic manipulators that I call the Global Cult. They know that if they dictate perception they will dictate behaviour and collectively dictate the nature of human society. They are further aware that perception is formed from information received and if they control the circulation of information they will to a vast extent direct human behaviour. Censorship of information and opinion has become globally Nazi- like in recent years and never more blatantly than since the illusory 'virus pandemic' was triggered out of China in 2019 and across the world in 2020. Why have billions submitted to house arrest and accepted fascistic societies in a way they would have never believed possible? Those controlling the information spewing from government, mainstream media and Silicon Valley (all controlled by the same Global Cult networks) told them they were in danger from a 'deadly virus' and only by submitting to house arrest and conceding their most basic of freedoms could they and their families be protected. This monumental and provable lie became the perception of the billions and therefore the behaviour of the billions. In those few words you have the whole structure and modus operandi of human control. Fear is a perception – False Emotion Appearing Real – and fear is the currency of control. In short ... get them by the balls (or give them the impression that you have) and their hearts and minds will follow. Nothing grips the dangly bits and freezes the rear-end more comprehensively than fear.

World number 1

There are two 'worlds' in what appears to be one 'world' and the prime difference between them is knowledge. First we have the mass of human society in which the population is maintained in coldly- calculated ignorance through control of information and the 'education' (indoctrination) system. That's all you really need to control to enslave billions in a perceptual delusion in which what are perceived to be their thoughts and opinions are ever-repeated mantras that the system has been downloading all their lives through 'education', media,

science, medicine, politics and academia in which the personnel and advocates are themselves overwhelmingly the perceptual products of the same repetition. Teachers and academics in general are processed by the same programming machine as everyone else, but unlike the great majority they never leave the 'education' program. It gripped them as students and continues to grip them as programmers of subsequent generations of students. The programmed become the programmers – the programmed programmers. The same can largely be said for scientists, doctors and politicians and not least because as the American writer Upton Sinclair said: 'It is difficult to get a man to understand something when his salary depends upon his not understanding it.' If your career and income depend on thinking the way the system demands then you will – bar a few free- minded exceptions – concede your mind to the Perceptual Mainframe that I call the Postage Stamp Consensus. This is a tiny band of perceived knowledge and possibility 'taught' (downloaded) in the schools and universities, pounded out by the mainstream media and on which all government policy is founded. Try thinking, and especially speaking and acting, outside of the 'box' of consensus and see what that does for your career in the Mainstream Everything which bullies, harasses, intimidates and ridicules the population into compliance. Here we have the simple structure which enslaves most of humanity in a perceptual prison cell for an entire lifetime and I'll go deeper into this process shortly. Most of what humanity is taught as fact is nothing more than programmed belief. American science fiction author Frank Herbert was right when he said: 'Belief can be manipulated. Only knowledge is dangerous.' In the 'Covid' age belief is promoted and knowledge is censored. It was always so, but never to the extreme of today. World number 2 of every day. World number 2 is a global network of secret societies and semi-secret groups dictating the direction of society via governments, corporations and authorities of every kind. I have spent more than 30 years uncovering and exposing this network that I call the Global Cult and knowing its agenda is what has made my books so accurate in predicting current and past events. Secret societies are secret for a reason. They want to keep their hoarded knowledge to themselves and their chosen initiates and to hide it from the

population which they seek through ignorance to control and subdue. The whole foundation of the division between World 1 and World 2 is knowledge. What number 1 knows number 2 must not. Knowledge they have worked so hard to keep secret includes (a) the agenda to enslave humanity in a centrally-controlled global dictatorship, and (b) the nature of reality and life itself. The latter (b) must be suppressed to allow the former (a) to prevail as I shall be explaining. The way the Cult manipulates and interacts with the population can be likened to a spider's web. The 'spider' sits at the centre in the shadows and imposes its will through the web with each strand represented in World number 2 by a secret society, satanic or semi-secret group, and in World number 1 – the world of the seen – by governments, agencies of government, law enforcement, corporations, the banking system, media conglomerates and Silicon Valley (Fig 1 overleaf). The spider and the web connect and coordinate all these organisations to pursue the same global outcome while the population sees them as individual entities working randomly and independently. At the level of the web governments are the banking system are the corporations are the media are Silicon Valley are the World Health Organization working from their inner cores as one unit. Apparently unconnected countries, corporations, institutions, organisations and people are on the same team pursuing the same global outcome. Strands in the web immediately around the spider are the most secretive and exclusive secret societies and their membership is emphatically restricted to the Cult inner-circle emerging through the generations from particular bloodlines for reasons I will come to. At the core of the core you would get them in a single room. That's how many people are dictating the direction of human society and its transformation through the 'Covid' hoax and other means. As the web expands out from the spider we meet the secret societies that many people will be aware of – the Freemasons, Knights Templar, Knights of Malta, Opus Dei, the inner sanctum of the Jesuit Order, and such like. Note how many are connected to the Church of Rome and there is a reason for that. The Roman Church was established as a revamp, a rebranding, of the relocated 'Church' of Babylon and the Cult imposing global tyranny today can be tracked back to Babylon and Sumer in what is Figure 1: The global web

through which the few control the many. (Image Neil Hague.) Inner levels of the web operate in the unseen away from the public eye and then we have what I call the cusp organisations located at the point where the hidden meets the seen. They include a series of satellite organisations answering to a secret society founded in London in the late 19th century called the Round Table and among them are the Royal Institute of International Affairs (UK, founded in 1920); Council on Foreign Relations (US, 1921); Bilderberg Group (worldwide, 1954); Trilateral Commission (US/worldwide, 1972); and the Club of Rome (worldwide, 1968) which was created to exploit environmental concerns to justify the centralisation of global power to 'save the planet'. The Club of Rome instigated with others the human-caused climate change hoax which has led to all the 'green new deals' demanding that very centralisation of control. Cusp organisations, which include endless 'think tanks' all over the world, are designed to coordinate a single global policy between political and business leaders, intelligence personnel, media organisations and anyone who can influence the direction of policy in their own sphere of operation. Major players and regular attendees will know what is happening – or some of it – while others come and go and are kept overwhelmingly in the dark about the big picture. I refer to these cusp groupings as semi-secret in that they can be publicly identified, but what goes on at the inner-core is kept very much 'in house' even from most of their members and participants through a fiercely-imposed system of compartmentalisation. Only let them know what they need to know to serve your interests and no more. The structure of secret societies serves as a perfect example of this principle. Most Freemasons never get higher than the bottom three levels of 'degree' (degree of knowledge) when there are 33 official degrees of the Scottish Rite. Initiates only qualify for the next higher 'compartment' or degree if those at that level choose to allow them. Knowledge can be carefully assigned only to those considered 'safe'. I went to my local Freemason's lodge a few years ago when they were having an 'open day' to show how cuddly they were and when I chatted to some of them I was astonished at how little the rank and file knew even about the most ubiquitous symbols they use. The mushroom technique – keep them in the dark and feed them bullshit – applies



to most people in the web as well as the population as a whole. Sub-divisions of the web mirror in theme and structure transnational corporations which have a headquarters somewhere in the world dictating to all their subsidiaries in different countries. Subsidiaries operate in their methodology and branding to the same centrally-dictated plan and policy in pursuit of particular ends. The Cult web functions in the same way. Each country has its own web as a subsidiary of the global one. They consist of networks of secret societies, semi-secret groups and bloodline families and their job is to impose the will of the spider and the global web in their particular country. Subsidiary networks control and manipulate the national political system, finance, corporations, media, medicine, etc. to ensure that they follow the globally-dictated Cult agenda. These networks were the means through which the 'Covid' hoax could be played out with almost every country responding in the same way. The 'Yessir' pyramid Compartmentalisation is the key to understanding how a tiny few can dictate the lives of billions when combined with a top-down sequence of imposition and acquiescence. The inner core of the Cult sits at the peak of the pyramidal hierarchy of human society (Fig 2 overleaf). It imposes its will – its agenda for the world – on the level immediately below which acquiesces to that imposition. This level then imposes the Cult will on the level below them which acquiesces and imposes on the next level. Very quickly we meet levels in the hierarchy that have no idea there even is a Cult, but the sequence of imposition and acquiescence continues down the pyramid in just the form "on-high" and so we be!er just do it.' Alfred Lord Tennyson said of the cannon fodder levels in his poem The Charge of the Light Brigade: 'Theirs not to reason why; theirs but to do and die.' The next line says that 'into the valley of death rode the six hundred' and they died because they obeyed without question what their perceived 'superiors' told them to do. In the same way the population capitulated to 'Covid'. The whole hierarchical pyramid functions like this to allow the very few to direct the enormous many. Eventually imposition-acquiescence-imposition-acquiescence comes down to the mass of the population at the foot of the pyramid. If they acquiesce to those levels of the hierarchy imposing on them (governments/law enforcement/doctors/media) a circuit is completed

between the population and the handful of super- psychopaths in the Cult inner core at the top of the pyramid. Without a circuit-breaking refusal to obey, the sequence of imposition and acquiescence allows a staggeringly few people to impose their will upon the entirety of humankind. We are looking at the very sequence that has subjugated billions since the start of 2020. Our freedom has not been taken from us. Humanity has given it away. Fascists do not impose fascism because there are not enough of them. Fascism is imposed by the population acquiescing to fascism. Put another way allowing their perceptions to be programmed to the extent that leads to the population giving their freedom away by giving their perceptions – their mind – away. If this circuit is not broken by humanity ceasing to cooperate with their own enslavement then nothing can change. For that to happen people have to critically think and see through the lies and window dressing and then summon the backbone to act upon what they see. The Cult spends its days working to stop either happening and its methodology is systematic and highly detailed, but it can be overcome and that is what this book is all about.

Figure 2: The simple sequence of imposition and compliance that allows a handful of people at the peak of the pyramid to dictate the lives of billions. The Life Program Okay, back to world number 1 or the world of the 'masses'. Observe the process of what we call 'life' and it is a perceptual download from cradle to grave. The Cult has created a global structure in which perception can be programmed and the program continually topped-up with what appears to be constant confirmation that the program is indeed true reality. The important word here is 'appears'. This is the structure, the fly-trap, the Postage Stamp Consensus or Perceptual Mainframe, which represents that incredibly narrow band of perceived possibility delivered by the 'education' system, mainstream media, science and medicine. From the earliest age the download begins with parents who have themselves succumbed to the very programming their children are about to go through. Most parents don't do this out of malevolence and mostly it is quite the opposite. They do what they believe is best for their children and that is what the program has told them is best. Within three or four years comes the major transition from parental programming to full- blown state (Cult) programming in school, college and

university where perceptually-programmed teachers and academics pass on their programming to the next generations. Teachers who resist are soon marginalised and their careers ended while children who resist are called a problem child for whom Ritalin may need to be prescribed. A few years after entering the 'world' children are under the control of authority figures representing the state telling them when they have to be there, when they can leave and when they can speak, eat, even go to the toilet. This is calculated preparation for a lifetime of obeying authority in all its forms. Reflex-action fear of authority is instilled by authority from the start. Children soon learn the carrot and stick consequences of obeying or defying authority which is underpinned daily for the rest of their life. Fortunately I daydreamed through this crap and never obeyed authority simply because it told me to. This approach to my alleged 'beliefs' continues to this day. There can be consequences of pursuing open-minded freedom in a world of closed-minded conformity. I spent a lot of time in school corridors after being ejected from the classroom for not taking some of it seriously and now I spend a lot of time being ejected from Facebook, YouTube and Twitter. But I can tell you that being true to yourself and not compromising your self-respect is far more exhilarating than bowing to authority for authority's sake. You don't have to be a sheep to the shepherd (authority) and the sheep dog (fear of not obeying authority). The perceptual download continues throughout the formative years in school, college and university while script-reading 'teachers', 'academics' 'scientists', 'doctors' and 'journalists' insist that ongoing generations must be as programmed as they are. Accept the program or you will not pass your 'exams' which confirm your 'degree' of programming. It is tragic to think that many parents pressure their offspring to work hard at school to download the program and qualify for the next stage at college and university. The late, great, American comedian George Carlin said: 'Here's a bumper sticker I'd like to see: We are proud parents of a child who has resisted his teachers' attempts to break his spirit and bend him to the will of his corporate masters.' Well, the best of luck finding many of those, George. Then comes the moment to leave the formal programming years in academia and enter the 'adult' world of work. There you meet

others in your chosen or prescribed arena who went through the same Postage Stamp Consensus program before you did. There is therefore overwhelming agreement between almost everyone on the basic foundations of Postage Stamp reality and the rejection, even contempt, of the few who have a mind of their own and are prepared to use it. This has two major effects. Firstly, the consensus confirms to the programmed that their download is really how things are. I mean, everyone knows that, right? Secondly, the arrogance and ignorance of Postage Stamp adherents ensure that anyone questioning the program will have unpleasant consequences for seeking their own truth and not picking their perceptions from the shelf marked: 'Things you must believe without question and if you don't you're a dangerous lunatic conspiracy theorist and a Every government, agency and corporation is founded on the same Postage Stamp prison cell and you can see why so many people believe the same thing while calling it their own 'opinion'. Fusion of governments and corporations in pursuit of the same agenda was the definition of fascism described by Italian dictator Benito Mussolini. The pressure to conform to perceptual norms downloaded for a lifetime is incessant and infiltrates society right down to family groups that become censors and condemners of their own 'black sheep' for not, ironically, being sheep. We have seen an explosion of that in the 'Covid' era. Cult-owned global media unleashes its propaganda all day every day in support of the Postage Stamp and targets with abuse and ridicule anyone in the public eye who won't bend their mind to the will of the tyranny. Any response to this is denied (certainly in my case). They don't want to give a platform to expose official lies. Cult-owned-and-created Internet giants like Facebook, Google, YouTube and Twiŕer delete you for having an unapproved opinion. Facebook boasts that its AI censors delete 97-percent of 'hate speech' before anyone even reports it. Much of that 'hate speech' will simply be an opinion that Facebook and its masters don't want people to see. Such perceptual oppression is widely known as fascism. Even Facebook executive Benny Thomas, a 'CEO Global Planning Lead', said in comments secretly recorded by investigative journalism operation Project Veritas that Facebook is 'too powerful' and should be broken up: I mean, no king in history has been the ruler of two billion people,

but Mark Zuckerberg is ... And he's 36. That's too much for a 36-year-old ... You should not have power over two billion people. I just think that's wrong. Thomas said Facebook-owned platforms like Instagram, Oculus, and WhatsApp needed to be separate companies. 'It's too much power when they're all one together'. That's the way the Cult likes it, however. We have an executive of a Cult organisation in Benny Thomas that doesn't know there is a Cult such is the compartmentalisation. Thomas said that Facebook and Google 'are no longer companies, they're countries'. Actually they are more powerful than countries on the basis that if you control information you control perception and control human society. I love my oppressor

Another expression of this psychological trickery is for those who realise they are being pressured into compliance to eventually convince themselves to believe the official narratives to protect their self-respect from accepting the truth that they have succumbed to meek and subservient compliance. Such people become some of the most vehement defenders of the system. You can see them everywhere screaming abuse at those who prefer to think for capitulation to conformity. 'You are talking dangerous nonsense you Covidiot!!' Are you trying to convince me or yourself? It is a potent form of Stockholm syndrome which is defined as: 'A psychological condition that occurs when a victim of abuse identifies and attaches, or bonds, positively with their abuser.' An example is hostages bonding and even 'falling in love' with their kidnappers. The syndrome has been observed in domestic violence, abused children, concentration camp inmates, prisoners of war and many and various Satanic cults. These are some traits of Stockholm syndrome listed at Positive regard towards perpetrators of abuse or captor [see Failure to cooperate with police and other government authorities when it comes to holding perpetrators of abuse or kidnapping accountable [or in the case of 'Covid' cooperating with the police to enforce and defend their captors' demands]. Little or no effort to escape [see 'Covid']. Belief in the goodness of the perpetrators or kidnappers [see Appeasement of captors. This is a manipulative strategy for maintaining one's safety. As victims get rewarded – perhaps with less abuse or even with life itself – their appeasing behaviours are reinforced [see 'Covid']. Learned helplessness. This can be akin to 'if you can't

beat 'em, join 'em'. As the victims fail to escape the abuse or captivity, they may start giving up and soon realize it's just easier for everyone if they acquiesce all their power to their captors [see 'Covid']. Feelings of pity toward the abusers, believing they are actually victims themselves. Because of this, victims may go on a crusade or mission to 'save' [protect] their abuser [see the venom unleashed on those challenging the official 'Covid' narrative]. Unwillingness to learn to detach from their perpetrators and heal. In essence, victims may tend to be less loyal to themselves than to their abuser [ definitely see 'Covid']. Ponder on those traits and compare them with the behaviour of great swathes of the global population who have defended governments and authorities which have spent every minute destroying their lives and livelihoods and those of their children and grandchildren since early 2020 with fascistic lockdowns, house arrest and employment deletion to 'protect' them from a 'deadly virus' that their abusers' perceptually created to bring about this very outcome. We are looking at mass Stockholm syndrome. All those that agree to concede their freedom will believe those perceptions are originating in their own independent 'mind' when in fact by conceding their reality to Stockholm syndrome they have by definition conceded any independence of mind. Listen to the 'opinions' of the acquiescing masses in this 'Covid' era and what gushes forth is the repetition of the official version of everything delivered unprocessed, unfiltered and unquestioned. The whole programming dynamic works this way. I must be free because I'm told that I am and so I think that I You can see what I mean with the chapter theme of 'I'm thinking – Oh, but are you?' The great majority are not thinking, let alone for themselves. They are repeating what authority has told them to believe which allows them to be controlled. Weaving through this mentality is the fear that the 'conspiracy theorists' are right and this again explains the often hysterical abuse that ensues when you dare to contest the official narrative of anything. Denial is the mechanism of hiding from yourself what you don't want to be true. Telling people what they want to hear is easy, but it's an infinitely greater challenge to tell them what they would rather not be happening. One is akin to pushing against an open door while the other is met with vehement resistance no matter what the scale of evidence. I

don't want it to be true so I'll convince myself that it's not. Examples are everywhere from the denial that a partner is cheating despite all the signs to the reflex-action rejection of any idea that world events in which country after country act in exactly the same way are centrally coordinated. To accept the latter is to accept that a force of unspeakable evil is working to destroy your life and the lives of your children with nothing too horrific to achieve that end. Who the heck wants that to be true? But if we don't face reality the end is duly achieved and the consequences are far worse and ongoing than breaking through the walls of denial today with the courage to make a stand against tyranny. Connect the dots – but how? A crucial aspect of perceptual programming is to portray a world in which everything is random and almost nothing is connected to anything else. Randomness cannot be coordinated by its very nature and once you perceive events as random the idea they could be connected is waved away as the rantings of the tinfoil-hat brigade. You can't plan and coordinate random you idiot! No, you can't, but you can hide the coldly-calculated and long-planned behind the illusion of randomness. A foundation manifestation of the Renegade Mind is to scan reality for patterns that connect the apparently random and turn pixels and dots into pictures. This is the way I work and have done so for more than 30 years. You look for similarities in people, modus operandi and desired outcomes and slowly, then ever quicker, the picture forms. For instance: There would seem to be no connection between the 'Covid pandemic' hoax and the human-caused global-warming hoax and yet they are masks (appropriately) on the same face seeking the same outcome. Those pushing the global warming myth through the Club of Rome and other Cult agencies are driving the lies about 'Covid' – Bill Gates is an obvious one, but they are endless. Why would the same people be involved in both when they are clearly not connected? Oh, but they are. Common themes with personnel are matched by common goals. The 'solutions' to both 'problems' are centralisation of global power to impose the will of the few on the many to 'save' humanity from 'Covid' and save the planet from an 'existential threat' (we need 'zero Covid' and 'zero carbon emissions'). These, in turn, connect with the 'dot' of globalisation which was coined to describe the centralisation of global power in every area

of life through incessant political and corporate expansion, trading blocks and superstates like the European Union. If you are the few and you want to control the many you have to centralise power and decision-making. The more you centralise power the more power the few at the centre will have over the many; and the more that power is centralised the more power those at the centre have to centralise even quicker. The momentum of centralisation gets faster and faster which is exactly the process we have witnessed. In this way the hoaxed 'pandemic' and the fakery of human-caused global warming serve the interests of globalisation and the seizure of global power in the hands of the Cult inner-circle which is behind 'Covid', 'climate change' and globalisation. At this point random 'dots' become a clear and obvious picture or paĵern. Klaus Schwab, the classic Bond villain who founded the Cult's Gates-funded World Economic Forum, published a book in 2020, *The Great Reset*, in which he used the 'problem' of 'Covid' to justify a total transformation of human society to 'save' humanity from 'climate change'. Schwab said: 'The pandemic represents a rare but narrow window of opportunity to reflect, reimagine, and reset our world.' What he didn't mention is that the Cult he serves is behind both hoaxes as I show in my book *The Answer*. He and the Cult don't have to reimagine the world. They know precisely what they want and that's why they destroyed human society with 'Covid' to 'build back beĵer' in their grand design. Their job is not to imagine, but to get humanity to imagine and agree with their plans while believing it's all random. It must be pure coincidence that 'The Great Reset' has long been the Cult's code name for the global imposition of fascism and replaced previous code-names of the 'New World Order' used by Cult frontmen like Father George Bush and the 'New Order of the Ages' which emerged from Freemasonry and much older secret societies. New Order of the Ages appears on the reverse of the Great Seal of the United States as 'Novus ordo seclorum' underneath the Cult symbol used since way back of the pyramid and all seeing-eye (Fig 3). The pyramid is the hierarchy of human control headed by the illuminated eye that symbolises the force behind the Cult which I will expose in later chapters. The term 'Annuĳt Coeptis' translates as 'He favours our undertaking'. We are told the 'He' is the Christian god, but 'He' is not as I will



be explaining. Figure 3: The all-seeing eye of the Cult 'god' on the Freemason-designed Great Seal of the United States and also on the dollar bill. Having you on Two major Cult techniques of perceptual manipulation that relate to all this are what I have called since the 1990s Problem-Reaction- Solution (PRS) and the Totalitarian Tiptoe (TT). They can be uncovered by the inquiring mind with a simple question: Who benefits? The answer usually identifies the perpetrators of a given action or happening through the concept of 'he who most benefits from a crime is the one most likely to have committed it'. The Latin 'Cui bono?' – Who benefits? – is widely attributed to the Roman orator and statesman Marcus Tullius Cicero. No wonder it goes back so far when the concept has been relevant to human behaviour since history was recorded. Problem-Reaction-Solution is the technique used to manipulate us every day by covertly creating a problem (or the illusion of one) and offering the solution to the problem (or the illusion of one). In the first phase you create the problem and blame someone or something else for why it has happened. This may relate to a financial collapse, terrorist attack, war, global warming or pandemic, anything in fact that will allow you to impose the 'solution' to change society in the way you desire at that time. The 'problem' doesn't have to be real. PRS is manipulation of perception and all you need is the population to believe the problem is real. Human-caused global warming and the 'Covid pandemic' only have to be perceived to be real for the population to accept the 'solutions' of authority. I refer to this technique as NO-Problem-Reaction-Solution. Billions did not meekly accept house arrest from early 2020 because there was a real deadly 'Covid pandemic' but because they perceived – believed – that to be the case. The antidote to Problem- Reaction-Solution is to ask who benefits from the proposed solution. Invariably it will be anyone who wants to justify more control through deletion of freedom and centralisation of power and The two world wars were Problem-Reaction-Solutions that transformed and realigned global society. Both were manipulated into being by the Cult as I have detailed in books since the mid- 1990s. They dramatically centralised global power, especially World War Two, which led to the United Nations and other global bodies thanks to the overt and covert manipulations of the

Rockefeller family and other Cult bloodlines like the Rothschilds. The UN is a stalking horse for full-blown world government that I will come to shortly. The land on which the UN building stands in New York was donated by the Rockefellers and the same Cult family was behind Big Pharma scalpel and drug 'medicine' and the creation of the World Health Organization as part of the UN. They have been stalwarts of the eugenics movement and funded Hitler's race-purity expert' Ernst Rudin. The human-caused global warming hoax has been orchestrated by the Club of Rome through the UN which is manufacturing both the 'problem' through its Intergovernmental Panel on Climate Change and imposing the 'solution' through its Agenda 21 and Agenda 2030 which demand the total centralisation of global power to 'save the world' from a climate hoax the United Nations is itself perpetrating. What a small world the Cult can be seen to be particularly among the inner circles. The bedfellow of Problem-Reaction-Solution is the Totalitarian Tiptoe which became the Totalitarian Sprint in 2020. The technique is fashioned to hide the carefully-coordinated behind the cover of apparently random events. You start the sequence at 'A' and you know you are heading for 'Z'. You don't want people to know that and each step on the journey is presented as a random happening while all the steps strung together lead in the same direction. The speed may have quickened dramatically in recent times, but you can still see the incremental approach of the Tiptoe in the case of 'Covid' as each new imposition takes us deeper into fascism. Tell people they have to do this or that to get back to 'normal', then this and this and this. With each new demand adding to the ones that went before the population's freedom is deleted until it disappears. The spider wraps its web around the flies more comprehensively with each new diktat. I'll highlight this in more detail when I get to the 'Covid' hoax and how it has been pulled off. Another prime example of the Totalitarian Tiptoe is how the Cult-created European Union went from a 'free-trade zone' to a centralised bureaucratic dictatorship through the Tiptoe of incremental centralisation of power until nations became mere administrative units for Cult-owned dark suits in Brussels. The antidote to ignorance is knowledge which the Cult seeks vehemently to deny us, but despite the systematic censorship to that end the Renegade Mind can overcome

this by vociferously seeking out the facts no matter the impediments put in the way. There is also a method of thinking and perceiving – knowing – that doesn't even need names, dates, place-type facts to identify the patterns that reveal the story. I'll get to that in the final chapter. All you need to know about the manipulation of human society and to what end is still out there – at the time of writing – in the form of books, videos and websites for those that really want to breach the walls of programmed perception. To access this knowledge requires the abandonment of the mainstream media as a source of information in the awareness that this is owned and controlled by the Cult and therefore promotes mass perceptions that suit the Cult. Mainstream media lies all day, every day. That is its function and very reason for being. Where it does tell the truth, here and there, is only because the truth and the Cult agenda very occasionally coincide. If you look for fact and insight to the BBC, CNN and virtually all the rest of them you are asking to be conned and perceptually programmed. Know the outcome and you'll see the journey Events seem random when you have no idea where the world is being taken. Once you do the random becomes the carefully planned. Know the outcome and you'll see the journey is a phrase I have been using for a long time to give context to daily happenings that appear unconnected. Does a problem, or illusion of a problem, trigger a proposed 'solution' that further drives society in the direction of the outcome? Invariably the answer will be yes and the random – abracadabra – becomes the clearly coordinated. So what is this outcome that unlocks the door to a massively expanded understanding of daily events? I will summarise its major aspects – the fine detail is in my other books – and those new to this information will see that the world they thought they were living in is a very different place. The foundation of the Cult agenda is the incessant centralisation of power and all such centralisation is ultimately in pursuit of Cult control on a global level. I have described for a long time the planned world structure of top-down dictatorship as the Hunger Games Society. The term obviously comes from the movie series which portrayed a world in which a few living in military-protected hi-tech luxury were the overlords of a population condemned to abject poverty in isolated 'sectors' that were not allowed to interact. 'Covid' lockdowns and travel

bans anyone? The 'Hunger Games' pyramid of structural control has the inner circle of the Cult at the top with preŷy much the entire population at the boŷom under their control through dependency for survival on the Cult. The whole structure is planned to be protected and enforced by a military-police state (Fig 4). Here you have the reason for the global lockdowns of the fake pandemic to coldly destroy independent incomes and livelihoods and make everyone dependent on the 'state' (the Cult that controls the 'states'). I have warned in my books for many years about the plan to introduce a 'guaranteed income' – a barely survivable piŷance – designed to impose dependency when employment was destroyed by AI technology and now even more comprehensively at great speed by the 'Covid' scam. Once the pandemic was played and lockdown consequences began to delete independent income the authorities began to talk right on cue about the need for a guaranteed income and a 'Great Reset'. Guaranteed income will be presented as benevolent governments seeking to help a desperate people – desperate as a direct result of actions of the same governments. The truth is that such payments are a trap. You will only get them if you do exactly what the authorities demand including mass vaccination (genetic manipulation). We have seen this theme already in Australia where those dependent on government benefits have them reduced if parents don't agree to have their children vaccinated according to an insane health- destroying government-dictated schedule. Calculated economic collapse applies to governments as well as people. The Cult wants rid of countries through the creation of a world state with countries broken up into regions ruled by a world government and super states like the European Union. Countries must be bankrupted, too, to this end and it's being achieved by the trillions in 'rescue packages' and furlough payments, trillions in lost taxation, and money-no-object spending on 'Covid' including constant all- medium advertising (programming) which has made the media dependent on government for much of its income. The day of reckoning is coming – as planned – for government spending and given that it has been made possible by printing money and not by production/taxation there is inflation on the way that has the potential to wipe out monetary value. In that case there will be no need for the Cult to steal

your money. It just won't be worth anything (see the German Weimar Republic before the Nazis took over). Many have been okay with lockdowns while getting a percentage of their income from so-called furlough payments without having to work. Those payments are dependent, however, on people having at least a theoretical job with a business considered non-essential and ordered to close. As these businesses go under because they are closed by lockdown after lockdown the furlough stops and it will be for everyone eventually. Then what? The 'then what?' is precisely the idea. Figure 4: The Hunger Games Society structure I have long warned was planned and now the 'Covid' hoax has made it possible. This is the real reason for lockdowns. Between the Hunger Games Cult elite and the dependent population is planned to be a vicious military-police state (a fusion of the two into one force). This has been in the making for a long time with police looking ever more like the military and carrying weapons to match. The pandemic scam has seen this process accelerate so fast as lockdown house arrest is brutally enforced by carefully recruited fascist minds and gormless system-servers. The police and military are planned to merge into a centrally-directed world army in a global structure headed by a world government which wouldn't be elected even by the election fixes now in place. The world army is not planned even to be human and instead wars would be fought, primarily against the population, using robot technology controlled by artificial intelligence. I have been warning about this for decades and now militaries around the world are being transformed by this very AI technology. The global regime that I describe is a particular form of fascism known as a technocracy in which decisions are not made by clueless and co-opted politicians but by unelected technocrats – scientists, engineers, technologists and bureaucrats. Cult-owned-and-controlled Silicon Valley giants are examples of technocracy and they already have far more power to direct world events than governments. They are with their censorship selecting governments. I know that some are calling the 'Great Reset' a Marxist communist takeover, but fascism and Marxism are different labels for the same tyranny. Tell those who lived in fascist Germany and Stalinist Russia that there was a difference in the way their freedom was deleted and their lives controlled. I could

call it a fascist technocracy or a Marxist technocracy and they would be equally accurate. The Hunger Games society with its world government structure would oversee a world army, world central bank and single world cashless currency imposing its will on a microchipped population (Fig 5). Scan its different elements and see how the illusory pandemic is forcing society in this very direction at great speed. Leaders of 23 countries and the World Health Organization (WHO) backed the idea in March, 2021, of a global treaty for 'international cooperation' in 'health emergencies' and nations should 'come together as a global community for peaceful cooperation that extends beyond this crisis'. Cut the Orwellian bullshit and this means another step towards global government. The plan includes a cashless digital money system that I first warned about in 1993. Right at the start of 'Covid' the deeply corrupt Tedros Adhanom Ghebreyesus, the crooked and merely gofer 'head' of the World Health Organization, said it was possible to catch the 'virus' by touching cash and it was better to use cashless means. The claim was ridiculous nonsense and like the whole 'Covid' mind-trick it was nothing to do with 'health' and everything to do with pushing every aspect of the Cult agenda. As a result of the Tedros lie the use of cash has plummeted. The Cult script involves a single world digital currency that would eventually be technologically embedded in the body. China is a massive global centre for the Cult and if you watch what is happening there you will know what is planned for everywhere. The Chinese government is developing a digital currency which would allow fines to be deducted immediately via AI for anyone caught on camera breaking its fantastic list of laws and the money is going to be programmable with an expiry date to ensure that no one can accrue wealth except the Cult and its Figure 5: The structure of global control the Cult has been working towards for so long and this has been enormously advanced by the 'Covid' illusion. Serfdom is so smart The Cult plan is far wider, extreme, and more comprehensive than even most conspiracy researchers appreciate and I will come to the true depths of deceit and control in the chapters 'Who controls the Cult?' and 'Escaping Wetiko'. Even the world that we know is crazy enough. We are being deluged with ever more sophisticated and controlling technology under the heading of 'smart'. We have smart

televisions, smart meters, smart cards, smart cars, smart driving, smart roads, smart pills, smart patches, smart watches, smart skin, smart borders, smart pavements, smart streets, smart cities, smart communities, smart environments, smart growth, smart planet ... smart everything around us. Smart technologies and methods of operation are designed to interlock to create a global Smart Grid connecting the entirety of human society including human minds to create a centrally-dictated 'hive' mind. 'Smart cities' is code for densely-occupied megacities of total surveillance and control through AI. Ever more destructive frequency communication systems like 5G have been rolled out without any official testing for health and psychological effects (colossal). 5G/6G/7G systems are needed to run the Smart Grid and each one becomes more destructive of body and mind. Deleting independent income is crucial to forcing people into these AI-policed prisons by ending private property ownership (except for the Cult elite). The Cult's Great Reset now openly foresees a global society in which no one will own any possessions and everything will be rented while the Cult would own literally everything under the guise of government and corporations. The aim has been to use the lockdowns to destroy sources of income on a mass scale and when the people are destitute and in unrepayable amounts of debt (problem) Cult assets come forward with the pledge to write-off debt in return for handing over all property and possessions (solution). Everything – literally everything including people – would be connected to the Internet via AI. I was warning years ago about the coming Internet of Things (IoT) in which all devices and technology from your car to your fridge would be plugged into the Internet and controlled by AI. Now we are already there with much more to come. The next stage is the Internet of Everything (IoE) which is planned to include the connection of AI to the human brain and body to replace the human mind with a centrally-controlled AI mind. Instead of perceptions being manipulated through control of information and censorship those perceptions would come direct from the Cult through AI. What do you think? You think whatever AI decides that you think. In human terms there would be no individual 'think' any longer. Too incredible? The ravings of a lunatic? Not at all. Cult-owned crazies in Silicon Valley have been telling us the plan for years without

explaining the real motivation and calculated implications. These include Google executive and 'futurist' Ray Kurzweil who highlights the year 2030 for when this would be underway. He said: Our thinking ... will be a hybrid of biological and non-biological thinking ... humans will be able to extend their limitations and 'think in the cloud' ... We're going to put gateways to the cloud in our brains ... We're going to gradually merge and enhance ourselves ... In my view, that's the nature of being human – we transcend our limitations. As the technology becomes vastly superior to what we are then the small proportion that is still human gets smaller and smaller and smaller until it's just utterly negligible. The sales-pitch of Kurzweil and Cult-owned Silicon Valley is that this would make us 'super-human' when the real aim is to make us post-human and no longer 'human' in the sense that we have come to know. The entire global population would be connected to AI and become the centrally-controlled 'hive-mind' of externally-delivered perceptions. The Smart Grid being installed to impose the Cult's will on the world is being constructed to allow particular locations – even one location – to control the whole global system. From these prime control centres, which absolutely include China and Israel, anything connected to the Internet would be switched on or off and manipulated at will. Energy systems could be cut, communication via the Internet taken down, computer-controlled driverless autonomous vehicles driven off the road, medical devices switched off, the potential is limitless given how much AI and Internet connections now run human society. We have seen nothing yet if we allow this to continue. Autonomous vehicle makers are working with law enforcement to produce cars designed to automatically pull over if they detect a police or emergency vehicle flashing from up to 100 feet away. At a police stop the car would be unlocked and the window rolled down automatically. Vehicles would only take you where the computer (the state) allowed. The end of petrol vehicles and speed limiters on all new cars in the UK and EU from 2022 are steps leading to electric computerised transport over which ultimately you have no control. The picture is far bigger even than the Cult global network or web and that will become clear when I get to the nature of the 'spider'. There is a connection between all these happenings and the instigation of DNA-manipulating



'vaccines' (which aren't 'vaccines') justified by the 'Covid' hoax. That connection is the unfolding plan to transform the human body from a biological to a synthetic biological state and this is why synthetic biology is such a fast-emerging discipline of mainstream science. 'Covid vaccines' are infusing self-replicating synthetic genetic material into the cells to cumulatively take us on the Totalitarian Tiptoe from Human 1.0 to the synthetic biological Human 2.0 which will be physically and perceptually attached to the Smart Grid to one hundred percent control every thought, perception and deed. Humanity needs to wake up and fast. This is the barest explanation of where the 'outcome' is planned to go but it's enough to see the journey happening all around us. Those new to this information will already see 'Covid' in a whole new context. I will add much more detail as we go along, but for the minutiae evidence see my mega-works, *The Answer*, *The Trigger* and *Everything You Need to Know But Have Never Been Told*. Now – how does a Renegade Mind see the 'world'? It is one thing to be clever and another to be wise George R.R. Martin simple definition of the difference between a programmed mind and a Renegade Mind would be that one sees only dots while the other connects them to see the picture. Reading reality with accuracy requires the observer to (a) know the planned outcome and (b) realise that everything, but everything, is connected. The entirety of infinite reality is connected – that's its very nature – and with human society an expression of infinite reality the same must apply. Simple cause and effect is a connection. The effect is triggered by the cause and the effect then becomes the cause of another effect. Nothing happens in isolation because it can't. Life in whatever reality is simple choice and consequence. We make choices and these lead to consequences. If we don't like the consequences we can make different choices and get different consequences which lead to other choices and consequences. The choice and the consequence are not only connected they are indivisible. You can't have one without the other as an old song goes. A few cannot control the world unless those being controlled allow that to happen – cause and effect, choice and consequence. Control – who has it and who doesn't – is a two-way process, a symbiotic relationship, involving the controller and controlled. 'They took my freedom away!!' Well, yes,

but you also gave it to them. Humanity is subjected to mass control because humanity has acquiesced to that control. This is all cause and effect and literally a case of give and take. In the same way world events of every kind are connected and the Cult works incessantly to sell the illusion of the random and coincidental to maintain the essential (to them) perception of dots that hide the picture. Renegade Minds know this and constantly scan the world for patterns of connection. This is absolutely pivotal in understanding the happenings in the world and without that perspective clarity is impossible. First you know the planned outcome and then you identify the steps on the journey – the day-by-day apparently random which, when connected in relation to the outcome, no longer appear as individual events, but as the proverbial chain of events leading in the same direction. I'll give you Political puppet show We are told to believe that politics is 'adversarial' in that different parties with different beliefs engage in an endless tussle for power. There may have been some truth in that up to a point – and only a point – but today divisions between 'different' parties are rhetorical not ideological. Even the rhetorical is fusing into one-speak as the parties eject any remaining free thinkers while others succumb to the ever-gathering intimidation of anyone with the 'wrong' opinion. The Cult is not a new phenomenon and can be traced back thousands of years as my books have documented. Its intergenerational initiates have been manipulating events with increasing effect the more that global power has been centralised. In ancient times the Cult secured control through the system of monarchy in which 'special' bloodlines (of which more later) demanded the right to rule as kings and queens simply by birthright and by vanquishing others who claimed the same birthright. There came a time, however, when people had matured enough to see the unfairness of such tyranny and demanded a say in who governed them. Note the word – governed them. Not served them – governed them, hence government defined as 'the political direction and control exercised over the actions of the members, citizens, or inhabitants of communities, societies, and states; direction of the affairs of a state, community, etc.' Governments exercise control over rather than serve just like the monarchies before them. Bizarrely there are still countries like the United Kingdom which are ruled by a

monarch and a government that officially answers to the monarch. The UK head of state and that of Commonwealth countries such as Canada, Australia and New Zealand is 'selected' by who in a single family had unprotected sex with whom and in what order. Pinch me it can't be true. Ouch! Shit, it is. The demise of monarchies in most countries offered a potential vacuum in which some form of free and fair society could arise and the Cult had that base covered. Monarchies had served its interests but they couldn't continue in the face of such widespread opposition and, anyway, replacing a 'royal' dictatorship that people could see with a dictatorship 'of the people' hiding behind the concept of 'democracy' presented far greater manipulative possibilities and ways of hiding coordinated tyranny behind the illusion of 'freedom'. Democracy is quite wrongly defined as government selected by the population. This is not the case at all. It is government selected by some of the population (and then only in theory). This 'some' doesn't even have to be the majority as we have seen so often in first-past-the-post elections in which the so-called majority party wins fewer votes than the 'losing' parties combined. Democracy can give total power to a party in government from a minority of the votes cast. It's a sleight of hand to sell tyranny as freedom. Seventy-four million Trump-supporting Americans didn't vote for the 'Democratic' Party of Joe Biden in the distinctly dodgy election in 2020 and yet far from acknowledging the wishes and feelings of that great percentage of American society the Cult-owned Biden government set out from day one to destroy them and their right to a voice and opinion. Empty shell Biden and his Cult handlers said lunacy and sickness to which politics has descended. Connect the dots and relate them to the desired outcome – a world government run by self-appointed technocrats and no longer even elected politicians. While operating through its political agents in government the Cult is at the same time encouraging public disdain for politicians by putting idiots and incompetents in theoretical power on the road to deleting them. The idea is to instil a public reaction that says of the technocrats: 'Well, they couldn't do any worse than the pathetic politicians.' It's all about controlling perception and Renegade Minds can see through that while programmed minds cannot when they are ignorant of both the planned outcome

and the manipulation techniques employed to secure that end. This knowledge can be learned, however, and fast if people choose to get informed. Politics may at first sight appear very difficult to control from a central point. I mean look at the 'different' parties and how would you be able to oversee them all and their constituent parts? In truth, it's very straightforward because of their structure. We are back to the pyramid of imposition and acquiescence. Organisations are structured in the same way as the system as a whole. Political parties are not open forums of free expression. They are hierarchies. I was a national spokesman for the British Green Party which claimed to be a different kind of politics in which influence and power was devolved; but I can tell you from direct experience – and it's far worse now – that Green parties are run as hierarchies like all the others however much they may try to hide that fact or kid themselves that it's not true. A very few at the top of all political parties are directing policy and personnel. They decide if you are elevated in the party or serve as a government minister and to do that you have to be a yes man or woman. Look at all the maverick political thinkers who never ascended the greasy pole. If you want to progress within the party or reach 'high-office' you need to fall into line and conform. Exceptions to this are rare indeed. Should you want to run for parliament or Congress you have to persuade the local or state level of the party to select you and for that you need to play the game as dictated by the hierarchy. If you secure election and wish to progress within the greater structure you need to go on conforming to what is acceptable to those running the hierarchy from the peak of the pyramid. Political parties are perceptual gulags and the very fact that there are party 'Whips' appointed to 'whip' politicians into voting the way the hierarchy demands exposes the ridiculous idea that politicians are elected to serve the people they are supposed to represent. Cult operatives and manipulation has long seized control of major parties that have any chance of forming a government and at least most of those that haven't. A new party forms and the Cult goes to work to infiltrate and direct. This has reached such a level today that you see video compilations of 'leaders' of all parties whether Democrats, Republicans, Conservative, Labour and Green parroting the same Cult mantra of 'Build Back Bejêr' and the

'Great Reset' which are straight off the Cult song-sheet to describe the transformation of global society in response to the Cult-instigated hoaxes of the 'Covid pandemic' and human-caused 'climate change'. To see Caroline Lucas, the Green Party MP that I knew when I was in the party in the 1980s, speaking in support of plans proposed by Cult operative Klaus Schwab representing the billionaire global elite is a real head-shaker. Many parties – one master The party system is another mind-trick and was instigated to change the nature of the dictatorship by swapping 'royalty' for dark suits that people believed – though now ever less so – represented their interests. Understanding this trick is to realise that a single force (the Cult) controls all parties either directly in terms of the major ones or through manipulation of perception and ideology with others. You don't need to manipulate Green parties to demand your transformation of society in the name of 'climate change' when they are obsessed with the lie that this is essential to 'save the planet'. You just give them a platform and away they go serving your interests while believing they are being environmentally virtuous. America's political structure is a perfect blueprint for how the two or multi- party system is really a one-party state. The Republican Party is controlled from one step back in the shadows by a group made up of billionaires and their gofers known as neoconservatives or Neocons. I have exposed them in fine detail in my books and they were the driving force behind the policies of the imbecilic presidency of Boy George Bush which included 9/11 (see The Trigger for a comprehensive demolition of the official story), the subsequent 'war on terror' (war of terror) and the invasions of Afghanistan and Iraq. The lajêr was a No-Problem-Reaction-Solution based on claims by Cult operatives, including Bush and British Prime Minister Tony Blair, about Saddam Hussein's 'weapons of mass destruction' which did not exist as war criminals Bush and Blair well knew. Figure 6: Different front people, different parties – same control system. The Democratic Party has its own 'Neocon' group controlling from the background which I call the 'Democons' and here's the penny-drop – the Neocons and Democons answer to the same masters one step further back into the shadows (Fig 6). At that level of the Cult the Republican and Democrat parties are controlled by the same people and no majêr which is

in power the Cult is in power. This is how it works in almost every country and certainly in Britain with Conservative, Labour, Liberal Democrat and Green parties now all on the same page whatever the rhetoric may be in their feeble attempts to appear different. Neocons operated at the time of Bush through a think tank called The Project for the New American Century which in September, 2000, published a document entitled Rebuilding America's Defenses: Strategies, Forces, and Resources For a New Century demanding that America fight 'multiple, simultaneous major theatre wars' as a 'core mission' to force regime- change in countries including Iraq, Libya and Syria. Neocons arranged for Bush ('Republican') and Blair ('Labour Party') to front- up the invasion of Iraq and when they departed the Democons orchestrated the targeting of Libya and Syria through Barack Obama ('Democrat') and British Prime Minister David Cameron ('Conservative Party'). We have 'different' parties and 'different' people, but the same unfolding script. The more the Cult has seized the reigns of parties and personnel the more their policies have transparently pursued the same agenda to the point where the fascist 'Covid' impositions of the Conservative junta of Jackboot Johnson in Britain were opposed by the Labour Party because they were not fascist enough. The Labour Party is likened to the US Democrats while the Conservative Party is akin to a British version of the Republicans and on both sides of the Atlantic they all speak the same language and support the direction demanded by the Cult although some more enthusiastically than others. It's a similar story in country after country because it's all centrally controlled. Oh, but what about Trump? I'll come to him shortly. Political 'choice' in the 'party' system goes like this: You vote for Party A and they get into government. You don't like what they do so next time you vote for Party B and they get into government. You don't like what they do when it's pretty much the same as Party A and why wouldn't that be with both controlled by the same force? Given that only two, sometimes three, parties have any chance of forming a government to get rid of Party B that you don't like you have to vote again for Party A which ... you don't like. This, ladies and gentlemen, is what they call 'democracy' which we are told - wrongly - is a term interchangeable with 'freedom'. The cult of cults At this point I need to introduce a major

expression of the Global Cult known as Sabbatian-Frankism. Sabbatian is also spelt as Sabbatean. I will summarise here. I have published major exposés and detailed background in other works. Sabbatian-Frankism combines the names of two frauds posing as 'Jewish' men, Sabbatai Zevi (1626-1676), a rabbi, black magician and occultist who proclaimed he was the Jewish messiah; and Jacob Frank (1726-1791), the Polish 'Jew', black magician and occultist who said he was the reincarnation of 'messiah' Zevi and biblical patriarch Jacob. They worked across two centuries to establish the Sabbatian-Frankist cult that plays a major, indeed central, role in the manipulation of human society by the Global Cult which has its origins much further back in history than Sabbatai Zevi. I should emphasise two points here in response to the shrill voices that will scream 'anti-Semitism': (1) Sabbatian-Frankists are NOT Jewish and only pose as such to hide their cult behind a Jewish façade; and (2) my information about this cult has come from Jewish sources who have long realised that their society and community has been infiltrated and taken over by interloper Sabbatian-Frankists. Infiltration has been the foundation technique of Sabbatian-Frankism from its official origin in the 17th century. Zevi's Sabbatian sect attracted a massive following described as the biggest messianic movement in Jewish history, spreading as far as Africa and Asia, and he promised a return for the Jews to the 'Promised Land' of Israel. Sabbatianism was not Judaism but an inversion of everything that mainstream Judaism stood for. So much so that this sinister cult would have a feast day when Judaism had a fast day and whatever was forbidden in Judaism the Sabbatians were encouraged and even commanded to do. This included incest and what would be today called Satanism. Members were forbidden to marry outside the sect and there was a system of keeping their children ignorant of what they were part of until they were old enough to be trusted not to unknowingly reveal anything to outsiders. The same system is employed to this day by the Global Cult in general which Sabbatian-Frankism has enormously influenced and now largely controls. Zevi and his Sabbatians suffered a setback with the intervention by the Sultan of the Islamic Ottoman Empire in the Middle East and what is now the Republic of Turkey where Zevi was located. The Sultan gave him the choice of proving his 'divinity',

converting to Islam or facing torture and death. Funnily enough Zevi chose to convert or at least appear to. Some of his supporters were disillusioned and drifted away, but many did not with 300 families also converting – only in theory – to Islam. They continued behind this Islamic smokescreen to follow the goals, rules and rituals of Sabbatianism and became known as 'crypto-Jews' or the 'Dönme' which means 'to turn'. This is rather ironic because they didn't 'turn' and instead hid behind a fake Islamic persona. The process of appearing to be one thing while being very much another would become the calling card of Sabbatianism especially after Zevi's death and the arrival of the Satanist Jacob Frank in the 18th century when the cult became Sabbatian-Frankism and plumbed still new depths of depravity and infiltration which included – still includes – human sacrifice and sex with children. Wherever Sabbatians go paedophilia and Satanism follow and is it really a surprise that Hollywood is so infested with child abuse and Satanism when it was established by Sabbatian-Frankists and is still controlled by them? Hollywood has been one of the prime vehicles for global perceptual programming and manipulation. How many believe the version of 'history' portrayed in movies when it is a travesty and inversion (again) of the truth? Rabbi Marvin Antelman describes Frankism in his book, *To Eliminate the Opiate*, as 'a movement of complete evil' while Jewish professor Gershom Scholem said of Frank in *The Messianic Idea in Judaism*: 'In all his actions [he was] a truly corrupt and degenerate individual ... one of the most frightening phenomena in the whole of Jewish history.' Frank was excommunicated by traditional rabbis, as was Zevi, but Frank was undeterred and enjoyed vital support from the House of Rothschild, the infamous banking dynasty whose inner-core are Sabbatian-Frankists and not Jews. Infiltration of the Roman Church and Vatican was instigated by Frank with many Dönme 'turning' again to convert to Roman Catholicism with a view to hijacking the reins of power. This was the ever-repeating modus operandi and continues to be so. Pose as an advocate of the religion, culture or country that you want to control and then manipulate your people into the positions of authority and influence largely as advisers, administrators and Svengalis for those that appear to be in power. They did this with Judaism, Christianity (Christian Zionism is part of



this), Islam and other religions and nations until Sabbatian-Frankism spanned the world as it does Sabbatian Saudis and the terror network. One expression of the Sabbatian-Frankist Dönme within Islam is the ruling family of Saudi Arabia, the House of Saud, through which came the vile distortion of Islam known as Wahhabism. This is the violent creed followed by terrorist groups like Al-Qaeda and ISIS or Islamic State. Wahhabism is the hand-chopping, head-chopping 'religion' of Saudi Arabia which is used to keep the people in a constant state of fear so the interloper House of Saud can continue to rule. Al-Qaeda and Islamic State were lavishly funded by the House of Saud while being created and directed by the Sabbatian-Frankist network in the United States that operates through the Pentagon, CIA and the government in general of whichever 'party'. The front man for the establishment of Wahhabism in the middle of the 18th century was a Sabbatian-Frankist 'crypto-Jew' posing as Islamic called Muhammad ibn Abd al-Wahhab. His daughter would marry the son of Muhammad bin Saud who established the first Saudi state before his death in 1765 with support from the British Empire. Bin Saud's successors would establish modern Saudi Arabia in league with the British and Americans in 1932 which allowed them to seize control of Islam's major shrines in Mecca and Medina. They have dictated the direction of Sunni Islam ever since while Iran is the major centre of the Shiite version and here we have the source of at least the public conflict between them. The Sabbatian network has used its Wahhabi extremists to carry out Problem-Reaction-Solution terrorist attacks in the name of 'Al-Qaeda' and 'Islamic State' to justify a devastating 'war on terror', ever-increasing surveillance of the population and to terrify people into compliance. Another insight of the Renegade Mind is the streetwise understanding that just because a country, location or people are attacked doesn't mean that those apparently representing that country, location or people are not behind the attackers. Often they are orchestrating the attacks because of the societal changes that can be then justified in the name of 'saving the population from terrorists'. I show in great detail in The Trigger how Sabbatian-Frankists were the real perpetrators of 9/11 and not '19 Arab hijackers' who were blamed for what happened. Observe what was justified in the name of

9/11 alone in terms of Middle East invasions, mass surveillance and control that fulfilled the demands of the Project for the New American Century document published by the Sabbatian Neocons. What appear to be enemies are on the deep inside players on the same Sabbatian team. Israel and Arab 'royal' dictatorships are all ruled by Sabbatians and the recent peace agreements between Israel and Saudi Arabia, the United Arab Emirates (UAE) and others are only making formal what has always been the case behind the scenes. Palestinians who have been subjected to grotesque tyranny since Israel was bombed and terrorised into existence in 1948 have never stood a chance. Sabbatian-Frankists have controlled Israel (so the constant theme of violence and war which Sabbatians love) and they have controlled the Arab countries that Palestinians have looked to for real support that never comes. 'Royal families' of the Arab world in Saudi Arabia, Bahrain, UAE, etc., are all Sabbatians with allegiance to the aims of the cult and not what is best for their Arabic populations. They have stolen the oil and financial resources from their people by false claims to be 'royal dynasties' with a genetic right to rule and by employing vicious militaries to impose. The Satanist Jacob Frank formed an alliance in 1773 with two other Sabbatians, Mayer Amschel Rothschild (1744-1812), founder of the Rothschild banking dynasty, and Jesuit-educated fraudulent Jew, Adam Weishaupt, and this led to the formation of the Bavarian Illuminati, firstly under another name, in 1776. The Illuminati would be the manipulating force behind the French Revolution (1789-1799) and was also involved in the American Revolution (1775-1783) before and after the Illuminati's official creation. Weishaupt would later become (in public) a Protestant Christian in archetypal Sabbatian style. I read that his name can be decoded as Adam-Weis- haupt or 'the first man to lead those who know'. He wasn't a leader in the sense that he was a subordinate, but he did lead those below him in a crusade of transforming human society that still continues today. The theme was confirmed as early as 1785 when a horseman courier called Lanz was reported to be struck by lightning and extensive Illuminati documents were found in his saddlebags. They made the link to Weishaupt and detailed the plan for world takeover. Current events with 'Covid' fascism have been in the making for a very long time. Jacob Frank was jailed for 13

years by the Catholic Inquisition after his arrest in 1760 and on his release he headed for Frankfurt, Germany, home city and headquarters of the House of Rothschild where the alliance was struck with Mayer Amschel Rothschild and Weishaupt. Rothschild arranged for Frank to be given the title of Baron and he became a wealthy nobleman with a big following of Jews in Germany, the Austro-Hungarian Empire and other European countries. Most of them would have believed he was on their side. The name 'Illuminati' came from the Zohar which is a body of works in the Jewish mystical 'bible' called the Kabbalah. 'Zohar' is the foundation of Sabbatian-Frankist belief and in Hebrew 'Zohar' means 'splendour', 'radiance', 'illuminated', and so we have 'Illuminati'. They claim to be the 'Illuminated Ones' from their knowledge systematically hidden from the human population and passed on through generations of carefully-chosen initiates in the global secret society network or Cult. Hidden knowledge includes an awareness of the Cult agenda for the world and the nature of our collective reality that I will explore later. Cult 'illumination' is symbolised by the torch held by the Statue of Liberty which was gifted to New York by French Freemasons in Paris who knew exactly what it represents. 'Liberty' symbolises the goddess worshipped in Babylon as Queen Semiramis or Ishtar. The significance of this will become clear. Notice again the ubiquitous theme of inversion with the Statue of 'Liberty' really symbolising mass control (Fig 7). A mirror-image statute stands on an island in the River Seine in Paris from where New York Liberty originated (Fig 8). A large replica of the Liberty flame stands on top of the Pont de l'Alma tunnel in Paris where Princess Diana died in a Cult ritual described in The Biggest Secret. Lucifer 'the light bringer' is related to all this (and much more as we'll see) and 'Lucifer' is a central figure in Sabbatian-Frankism and its associated Satanism. Sabbatians reject the Jewish Torah, or Pentateuch, the 'five books of Moses' in the Old Testament known as Genesis, Exodus, Leviticus, Numbers, and Deuteronomy which are claimed by Judaism and Christianity to have been dictated by 'God' to Moses on Mount Sinai. Sabbatians say these do not apply to them and they seek to replace them with the Zohar to absorb Judaism and its followers into their inversion which is an expression of a much greater global inversion. They want to delete all

religions and force humanity to worship a one-world religion – Sabbatian Satanism that also includes worship of the Earth goddess. Satanic themes are being more and more introduced into mainstream society and while Christianity is currently the foremost target for destruction the others are planned to follow. Figure 7: The Cult goddess of Babylon disguised as the Statue of Liberty holding the flame of Lucifer the ‘light bringer’. Figure 8: Liberty’s mirror image in Paris where the New York version originated. Rabbi Marvin Antelman connects the Illuminati to the Jacobins in To Eliminate the Opiate and Jacobins were the force behind the French Revolution. He links both to the Bund der Gerechten, or League of the Just, which was the network that inflicted communism/Marxism on the world. Antelman wrote: The original inner circle of the Bund der Gerechten consisted of born Catholics, Protestants and Jews [Sabbatian-Frankist infiltrators], and those representatives of respective subdivisions formulated schemes for the ultimate destruction of their faiths. The heretical Catholics laid plans which they felt would take a century or more for the ultimate destruction of the church; the apostate Jews for the ultimate destruction of the Jewish religion. Sabbatian-created communism connects into this anti-religion agenda in that communism does not allow for the free practice of religion. The Sabbatian ‘Bund’ became the International Communist Party and Communist League and in 1848 ‘Marxism’ was born with the Communist Manifesto of Sabbatian assets Karl Marx and Friedrich Engels. It is absolutely no coincidence that Marxism, just a different name for fascist and other centrally-controlled tyrannies, is being imposed worldwide as a result of the ‘Covid’ hoax and nor that Marxist/fascist China was the place where the hoax originated. The reason for this will become very clear in the chapter ‘Covid: The calculated catastrophe’. The so-called ‘Woke’ mentality has hijacked traditional beliefs of the political left and replaced them with far- right make-believe ‘social justice’ better known as Marxism. Woke will, however, be swallowed by its own perceived ‘revolution’ which is really the work of billionaires and billionaire corporations feigning being ‘Woke’. Marxism is being touted by Wokers as a replacement for ‘capitalism’ when we don’t have ‘capitalism’. We have cartelism in which the market is stitched up by the very Cult billionaires and corporations

bankrolling Woke. Billionaires love Marxism which keeps the people in servitude while they control from the top. Terminally naïve Wokers think they are 'changing the world' when their vital part and become surplus to requirements they, too, will be targeted. The Illuminati-Jacobins were behind the period known as 'The Terror' in the French Revolution in 1793 and 1794 when Jacobin Maximillian de Robespierre and his Orwellian 'Commîjée of Public Safety' killed 17,000 'enemies of the Revolution' who had once been 'friends of the Revolution'. Karl Marx (1818-1883), whose Sabbatian creed of Marxism has cost the lives of at least 100 million people, is a hero once again to Wokers who have been systematically kept ignorant of real history by their 'education' programming. As a result they now promote a Sabbatian 'Marxist' abomination destined at some point to consume them. Rabbi Antelman, who spent decades researching the Sabbatian plot, said of the League of the Just and Contrary to popular opinion Karl Marx did not originate the Communist Manifesto. He was paid for his services by the League of the Just, which was known in its country of origin, Germany, as the Bund der Geachteten. Antelman said the text aîtributed to Marx was the work of other people and Marx 'was only repeating what others already said'. Marx was 'a hired hack – lackey of the wealthy Illuminists'. Marx famously said that religion was the 'opium of the people' (part of the Sabbatian plan to demonise religion) and Antelman called his books, To Eliminate the Opiate. Marx was born Jewish, but his family converted to Christianity (Sabbatian modus operandi) and he so he supported the Sabbatian plan to destroy traditional Jewishness and Judaism which we are clearly seeing today with the vindictive targeting of orthodox Jews by the Sabbatian government of Israel over 'Covid' laws. I don't follow any religion and it has done much damage to the world over centuries and acted as a perceptual straightjacket. Renegade Minds, however, are always asking why something is being done. It doesn't maîjer if they agree or disagree with what is happening – why is it happening is the question. The 'why?' can be answered with regard to religion in that religions create interacting communities of believers when the Cult wants to dismantle all discourse, unity and interaction (see 'Covid' lockdowns) and the ultimate goal is to delete all religions for a one- world religion of Cult Satanism

worshipping their 'god' of which more later. We see the same 'why?' with gun control in America. I don't have guns and don't want them, but why is the Cult seeking to disarm the population at the same time that law enforcement agencies are armed to their molars and why has every tyrant in history sought to disarm people before launching the final takeover? They include Hitler, Stalin, Pol Pot and Mao who followed confiscation with violent seizing of power. You know it's a Cult agenda by the people who immediately race to the microphones to exploit dead people in multiple shootings. Ultra-Zionist Cult lackey Senator Chuck Schumer was straight on the case after ten people were killed in Boulder, Colorado in March, 2021. Simple rule ... if Schumer wants it the Cult wants it and the same with his ultra-Zionist mate the wild-eyed Senator Adam Schiff. At the same time they were calling for the disarmament of Americans, many of whom live a long way from a police response, Schumer, Schiff and the rest of these pampered clowns were sitting on Capitol Hill behind a razor-wired security fence protected by thousands of armed troops in addition to their own armed bodyguards. Mom and pop in an isolated home? They're just potential mass shooters. Sabbatian-Frankists and most importantly the Rothschilds were behind the creation of 'Zionism', a political movement that demanded a Jewish homeland in Israel as promised by Sabbatai Zevi. The very symbol of Israel comes from the German meaning of the name Rothschild. Dynasty founder Mayer Amschel Rothschild changed the family name from Bauer to Rothschild, or 'Red-Shield' in German, in deference to the six-pointed 'Star of David' hexagram displayed on the family's home in Frankfurt. The symbol later appeared on the flag of Israel after the Rothschilds were centrally involved in its creation. Hexagrams are not a uniquely Jewish symbol and are widely used in occult ('hidden') networks often as a symbol for Saturn (see my other books for why). Neither are Zionism and Jewishness interchangeable. Zionism is a political movement and philosophy and not a 'race' or a people. Many Jews oppose Zionism and many non-Jews, including US President Joe Biden, call themselves Zionists as does Israel-centric Donald Trump. America's support for the Israel government is pretty much a gimme with ultra-Zionist billionaires and corporations providing fantastic and dominant funding for both political

parties. Former Congresswoman Cynthia McKinney has told how she was approached immediately she ran for office to 'sign the pledge' to Israel and confirm that she would always vote in that country's best interests. All American politicians are approached in this way. Anyone who refuses will get no support or funding from the enormous and all-powerful Zionist lobby that includes organisations like mega-lobby group AIPAC, the American Israel Public Affairs Committee. Trump's biggest funder was ultra-Zionist casino and media billionaire Sheldon Adelson while major funders of the Democratic Party include ultra-Zionist George Soros and ultra-Zionist financial and media mogul, Haim Saban. Some may reel back at the suggestion that Soros is an Israel-firster (Sabbatian-controlled Israel-firster), but Renegade Minds watch the actions not the words and everywhere Soros donates his billions the Sabbatian agenda benefits. In the spirit of Sabbatian inversion Soros pledged \$1 billion for a new university network to promote 'liberal values and tackle intolerance'. He made the announcement during his annual speech at the Cult-owned World Economic Forum in Davos, Switzerland, in January, 2020, after his 'harsh criticism' of 'authoritarian rulers' around the world. You can only laugh at such brazen mendacity. How he doesn't laugh is the mystery. Translated from the Orwellian 'liberal values and tackle intolerance' means teaching non-white people to hate white people and for white people to loathe themselves for being born white. The reason for that will become The 'Anti-Semitism' fraud Zionists support the Jewish homeland in the land of Palestine which has been the Sabbatian-Rothschild goal for so long, but not for the benefit of Jews. Sabbatians and their global Anti-Semitism Industry have skewed public and political opinion to equate opposing the violent extremes of Zionism to be a blanket attack and condemnation of all Jewish people. Sabbatians and their global Anti-Semitism Industry have skewed public and political opinion to equate opposing the violent extremes of Zionism to be a blanket attack and condemnation of all Jewish people. This is nothing more than a Sabbatian protection racket to stop legitimate investigation and exposure of their agendas and activities. The official definition of 'anti-Semitism' has more recently been expanded to include criticism of Zionism – a political movement – and this was

done to further stop exposure of Sabbatian infiltrators who created Zionism as we know it today in the 19th century. Renegade Minds will talk about these subjects when they know the shit that will come their way. People must decide if they want to know the truth or just cower in the corner in fear of what others will say. Sabbatians have been trying to label me as 'anti-Semitic' since the 1990s as I have uncovered more and more about their background and agendas. Useless, gutless, fraudulent 'journalists' then just repeat the smears without question and on the day I was writing this section a pair of unquestioning repeaters called Ben Quinn and Archie Bland (how appropriate) outright called me an 'anti-Semite' in the establishment propaganda sheet, the London Guardian, with no supporting evidence. The Sabbatian Anti-Semitism Industry said so and who are they to question that? They wouldn't dare. Ironically 'Semitic' refers to a group of languages in the Middle East that are almost entirely Arabic. 'Anti-Semitism' becomes 'anti-Arab' which if the consequences of this misunderstanding were not so grave would be hilarious. Don't bother telling Quinn and Bland. I don't want to confuse them, bless 'em. One reason I am dubbed 'anti-Semitic' is that I wrote in the 1990s that Jewish operatives (Sabbatians) were heavily involved in the Russian Revolution when Sabbatians overthrew the Romanov dynasty. This apparently made me 'anti-Semitic'. Oh, really? Here is a section from The Trigger: British journalist Robert Wilton confirmed these themes in his 1920 book The Last Days of the Romanovs when he studied official documents from the Russian government to identify the members of the Bolshevik ruling elite between 1917 and 1919. The Central Committee included 41 Jews among 62 members; the Council of the People's Commissars had 17 Jews out of 22 members; and 458 of the 556 most important Bolshevik positions between 1918 and 1919 were occupied by Jewish people. Only 17 were Russian. Then there were the 23 Jews among the 36 members of the vicious Cheka Soviet secret police established in 1917 who would soon appear all across the country. Professor Robert Service of Oxford University, an expert on 20th century Russian history, found evidence that ['Jewish'] Leon Trotsky had sought to make sure that Jews were enrolled in the Red Army and were disproportionately represented in the Soviet civil



bureaucracy that included the Cheka which performed mass arrests, imprisonment and executions of 'enemies of the people'. A US State Department Decimal File (861.00/5339) dated November 13th, 1918, names [Rothschild banking agent in America] Jacob Schiff and a list of ultra-Zionists as funders of the Russian Revolution leading to claims of a 'Jewish plot', but the key point missed by all is they were not 'Jews' – they were Sabbatian-Frankists. Britain's Winston Churchill made the same error by mistake or otherwise. He wrote in a 1920 edition of the Illustrated Sunday Herald that those behind the Russian revolution were part of a 'worldwide conspiracy for the overthrow of civilisation and for the reconstitution of society on the basis of arrested development, of envious malevolence, and impossible equality' (see 'Woke' today because that has been created by the same network). Churchill said there was no need to exaggerate the part played in the creation of Bolshevism and in the actual bringing about of the Russian Revolution 'by these international and for the most part atheistical Jews' ['atheistical Jews' = Sabbatians]. Churchill said it is certainly a very great one and probably outweighs all others: 'With the notable exception of Lenin, the majority of the leading figures are Jews.' He went on to describe, knowingly or not, the Sabbatian modus operandi of placing puppet leaders nominally in power while they control from the background: Moreover, the principal inspiration and driving power comes from the Jewish leaders. Thus Tchitcherin, a pure Russian, is eclipsed by his nominal subordinate, Litvinoff, and the influence of Russians like Bukharin or Lunacharski cannot be compared with the power of Trotsky, or of Zinovieff, the Dictator of the Red Citadel (Petrograd), or of Krassin or Radek – all Jews. In the Soviet institutions the predominance of Jews is even more astonishing. And the prominent, if not indeed the principal, part in the system of terrorism applied by the Extraordinary Commissions for Combatting Counter-Revolution has been taken by Jews, and in some notable cases by Jewesses. What I said about seriously disproportionate involvement in the Russian Revolution by Jewish 'revolutionaries' (Sabbatians) is provable fact, but truth is no defence against the Sabbatian Anti- Semitism Industry, its repeater parrots like Quinn and Bland, and the now breathtaking network of so-called 'Woke' 'anti-hate' groups with

interlocking leaderships and funding which have the role of discrediting and silencing anyone who gets too close to exposing the Sabbatians. We have seen 'truth is no defence' confirmed in legal judgements with the Saskatchewan Human Rights Commission in Canada decreeing this: 'Truthful statements can be presented in a manner that would meet the definition of hate speech, and not all truthful statements must be free from restriction.' Most 'anti-hate' activists, who are themselves consumed by hatred, are too stupid and ignorant of the world to know how they are being used. They are far too far up their own virtue-signalling arses and it's far too dark for them to see anything.

The background and methods of the 'Russian' Revolution are straight from the Sabbatian playbook seen in the French Revolution and endless others around the world that appear to start as a revolution of the people against tyrannical rule and end up with a regime change to more tyrannical rule overtly or covertly. Wars, terror attacks and regime overthrows follow the Sabbatian cult through history with its agents creating them as Problem-Reaction-Solutions to remove opposition on the road to world domination. Sabbatian dots connect the Rothschilds with the Illuminati, Jacobins of the French Revolution, the 'Bund' or League of the Just, the International Communist Party, Communist League and the Communist Manifesto of Karl Marx and Friedrich Engels that would lead to the Rothschild-funded Russian Revolution. The sequence comes under the heading of 'creative destruction' when you advance to your global goal by continually destroying the status quo to install a new status quo which you then also destroy. The two world wars come to mind. With each new status quo you move closer to your planned outcome. Wars and mass murder are to Sabbatians a collective blood sacrifice ritual. They are obsessed with death for many reasons and one is that death is an inversion of life. Satanists and Sabbatians are obsessed with death and often target churches and churchyards for their rituals. Inversion-obsessed Sabbatians explain the use of inverted symbolism including the inverted pentagram and inverted cross. The inversion of the cross has been related to targeting Christianity, but the cross was a religious symbol long before Christianity and its inversion is a statement about the Sabbatian mentality and goals more than any single

religion. Sabbatians operating in Germany were behind the rise of the occult-obsessed Nazis and the subsequent Jewish exodus from Germany and Europe to Palestine and the United States after World War Two. The Rothschild dynasty was at the forefront of this both as political manipulators and by funding the operation. Why would Sabbatians help to orchestrate the horrors inflicted on Jews by the Nazis and by Stalin after they organised the Russian Revolution? Sabbatians hate Jews and their religion, that's why. They pose as Jews and secure positions of control within Jewish society and play the 'anti-Semitism' card to protect themselves from exposure through a global network of organisations answering to the Sabbatian-created-and-controlled globe-spanning intelligence network that involves a stunning web of military-intelligence operatives and operations for a tiny country of just nine million. Among them are Jewish assets who are not Sabbatians but have been and the Jewish community to protect them from what they have been programmed since childhood to believe is a Jew-hating hostile world. The Jewish community is just a highly convenient cover to hide the true nature of Sabbatians. Anyone getting close to exposing their game is accused by Sabbatian place-people and gofers of 'anti-Semitism' and claiming that all Jews are part of a plot to take over the world. I am not saying that. I am saying that Sabbatians – the real Jew-haters – have infiltrated the Jewish community to use them both as a cover and an 'anti-Semitic' defence against exposure. Thus we have the Anti-Semitism Industry targeted researchers in this way and most Jewish people think this is justified and genuine. They don't know that their 'Jewish' leaders and institutions of state, intelligence and military are not controlled by Jews at all, but cultists and stooges of Sabbatian-Frankism. I once added my name to a pro-Jewish freedom petition online and the next time I looked my name was gone and text had been added to the petition blurb to attack me as an 'anti-Semite' such is the scale of perceptual programming. Moving on America I tell the story in The Trigger and a chapter called 'Atlantic Crossing' how particularly after Israel was established the Sabbatians moved in on the United States and eventually grasped control of government administration, the political system via both Democrats and Republicans, the intelligence community like the CIA

and National Security Agency (NSA), the Pentagon and mass media. Through this seriously compartmentalised network Sabbatians and their operatives in Mossad, Israeli Defense Forces (IDF) and US agencies pulled off 9/11 and blamed it on 19 'Al-Qaeda hijackers' dominated by men from, or connected to, Sabbatian-ruled Saudi Arabia. The '19' were not even on the planes let alone flew those big passenger jets into buildings while being largely incompetent at piloting one-engine light aircraft. 'Hijacker' Hani Hanjour who is said to have flown American Airlines Flight 77 into the Pentagon with a turn and manoeuvre most professional pilots said they would have struggled to do was banned from renting a small plane by instructors at the Freeway Airport in Bowie, Maryland, just six weeks earlier on the grounds that he was an incompetent pilot. The Jewish population of the world is just 0.2 percent with even that almost entirely concentrated in Israel (75 percent Jewish) and the United States (around two percent). This two percent and globally 0.2 percent refers to Jewish people and not Sabbatian interlopers who are a fraction of that fraction. What a sobering thought when you think of the fantastic influence on world affairs of tiny Israel and that the Project for the New American Century (PNAC) which laid out the blueprint in September, 2000, for America's war on terror and regime change wars in Iraq, Libya and Syria was founded and dominated by Sabbatians known as 'Neocons'. The document conceded that this plan would not be supported politically or publicly without a major attack on American soil and a Problem-Reaction-Solution excuse to send troops to war across the Middle East. Sabbatian Neocons said: ... [The] process of transformation ... [war and regime change] ... is likely to be a long one, absent some catastrophic and catalysing event – like a new Pearl Harbor. Four months later many of those who produced that document came to power with their inane puppet George Bush from the long-time Sabbatian Bush family. They included Sabbatian Dick Cheney who was officially vice-president, but really de-facto president for the entirety of the 'Bush' government. Nine months after the 'Bush' inauguration came what Bush called at the time 'the Pearl Harbor of the 21st century' and with typical Sabbatian timing and symbolism 2001 was the 60th anniversary of the attack in 1941 by the Japanese Air Force on Pearl Harbor, Hawaii, which

allowed President Franklin Delano Roosevelt to take the United States into a Sabbatian-instigated Second World War that he said in his election campaign that he never would. The evidence is overwhelming that Roosevelt and his military and intelligence networks knew the attack was coming and did nothing to stop it, but they did make sure that America's most essential naval ships were not in Hawaii at the time. Three thousand Americans died in the Pearl Harbor attacks as they did on September 11th. By the 9/11 year of 2001 Sabbatians had widely infiltrated the US government, military and intelligence operations and used their compartmentalised assets to pull off the 'Al-Qaeda' attacks. If you read *The Trigger* it will blow your mind to see the utterly staggering concentration of 'Jewish' operatives (Sabbatian infiltrators) in essential positions of political, security, legal, law enforcement, financial and business power before, during, and after the attacks to make them happen, carry them out, and then cover their tracks – and I do mean staggering when you think of that 0.2 percent of the world population and two percent of Americans which are Jewish while Sabbatian infiltrators are a fraction of that. A central foundation of the 9/11 conspiracy was the hijacking of government, military, Air Force and intelligence computer systems in real time through 'back-door' access made possible by Israeli (Sabbatian) 'cyber security' software. Sabbatian-controlled Israel is on the way to rivalling Silicon Valley for domination of cyberspace and is becoming the dominant force in cyber-security which gives them access to entire computer systems and their passcodes across the world. Then add to this that Zionists head (officially) Silicon Valley giants like Google (Larry Page and Sergey Brin), Google-owned YouTube (Susan Wojcicki), Facebook (Mark Zuckerberg and Sheryl Sandberg), and Apple (Chairman Arthur D. Levinson), and that ultra-Zionist hedge fund billionaire Paul Singer has a \$1 billion stake in Twitter which is only nominally headed by 'CEO' pothead Jack Dorsey. As cable news host Tucker Carlson said of Dorsey: 'There used to be debate in the medical community whether dropping a ton of acid had permanent effects and I think that debate has now ended.' Carlson made the comment after Dorsey told a hearing on Capitol Hill (if you cut through his bullshit) that he believed in free speech so long as he got to decide what you can

hear and see. These 'big names' of Silicon Valley are only front men and women for the Global Cult, not least the Sabbatians, who are the true controllers of these corporations. Does anyone still wonder why these same people and companies have been ferociously censoring and banning people (like me) for exposing any aspect of the Cult agenda and especially the truth about the 'Covid' hoax which Sabbatians have orchestrated? The Jeffrey Epstein paedophile ring was a Sabbatian operation. He was officially 'Jewish' but he was a Sabbatian and women abused by the ring have told me about the high number of 'Jewish' people involved. The Epstein horror has Sabbatian wriĳen all over it and matches perfectly their modus operandi and obsession with sex and ritual. Epstein was running a Sabbatian blackmail ring in which famous people with political and other influence were provided with young girls for sex while everything was being filmed and recorded on hidden cameras and microphones at his New York house, Caribbean island and other properties. Epstein survivors have described this surveillance system to me and some have gone public. Once the famous politician or other figure knew he or she was on video they tended to do whatever they were told. Here we go again ...when you've got them by the balls their hearts and minds will follow. Sabbatians use this blackmail technique on a wide scale across the world to entrap politicians and others they need to act as demanded. Epstein's private plane, the infamous 'Lolita Express', had many well-known passengers including Bill Clinton while Bill Gates has flown on an Epstein plane and met with him four years aĳer Epstein had been jailed for paedophilia. They subsequently met many times at Epstein's home in New York according to a witness who was there. Epstein's infamous side-kick was Ghislaine Maxwell, daughter of Mossad agent and ultra-Zionist mega-crooked British businessman, Bob Maxwell, who at one time owned the Daily Mirror newspaper. Maxwell was murdered at sea on his boat in 1991 by Sabbatian-controlled Mossad when he became a liability with his business empire collapsing as a former Mossad operative has confirmed (see The Trigger). Money, money, money, funny money ... Before I come to the Sabbatian connection with the last three US presidents I will lay out the crucial importance to Sabbatians of controlling banking and finance. Sabbatian Mayer

Amschel Rothschild set out to dominate this arena in his family's quest for total global control. What is freedom? It is, in effect, choice. The more choices you have the freer you are and the fewer your choices the more you are enslaved. In the global structure created over centuries by Sabbatians the biggest decider and restrictor of choice is ... money. Across the world if you ask people what they would like 'I don't have the money'. This is the idea. A global elite of multi- billionaires are described as 'greedy' and that is true on one level; but control of money – who has it and who doesn't – is not primarily about greed. It's about control. Sabbatians have seized ever more control of finance and sucked the wealth of the world out of the hands of the population. We talk now, after all, about the 'One- percent' and even then the wealthiest are a lot fewer even than that. This has been made possible by a money scam so outrageous and so vast it could rightly be called the scam of scams founded on creating 'money' out of nothing and 'loaning' that with interest to the population. Money out of nothing is called 'credit'. Sabbatians have asserted control over governments and banking ever more completely through the centuries and secured financial laws that allow banks to lend hugely more than they have on deposit in a confidence trick known as fractional reserve lending. Imagine if you could lend money that doesn't exist and charge the recipient interest mansions, private jets, Malibu and Monaco. Banks are only required to keep a fraction of their deposits and wealth in their vaults and they are allowed to lend 'money' they don't have called 'credit'. Go into a bank for a loan and if you succeed the banker will not move any real wealth into your account. They will type into your account the amount of the agreed 'loan' – say £100,000. This is not wealth that really exists; it is non-existent, fresh- air, created-out-of-nothing 'credit' which has never, does not, and will never exist except in theory. Credit is backed by nothing except wind and only has buying power because people think that it has buying power and accept it in return for property, goods and services. I have described this situation as like those cartoon characters you see chasing each other and when they run over the edge of a cliff they keep running forward on fresh air until one of them looks down, realises what's happened, and they all crash into the ravine. The whole foundation of the Sabbatian financial

system is to stop people looking down except for periodic moments when they want to crash the system (as in 2008 and 2020 ongoing) and reap the rewards from all the property, businesses and wealth their borrowers had signed over as 'collateral' in return for a 'loan' of fresh air. Most people think that money is somehow created by governments when it comes into existence from the start as a debt through banks 'lending' illusory money called credit. Yes, the very currency of exchange is a debt from day one issued as an interest-bearing loan. Why don't governments create money interest-free and lend it to their people interest-free? Governments are controlled by Sabbatians and the financial system is controlled by Sabbatians for whom interest-free money would be a nightmare come true. Sabbatians underpin their financial domination through their global network of central banks, including the privately-owned US Federal Reserve and Britain's Bank of England, and this is orchestrated by a privately-owned central bank coordination body called the Bank for International Settlements in Basle, Switzerland, created by the usual suspects including the Rockefellers and Rothschilds. Central bank chiefs don't answer to governments or the people. They answer to the Bank for International Settlements or, in other words, the Global Cult which is dominated today by Sabbatians. There are so many constituent scams within the overall banking scam. When you take out a loan of thin-air credit only the amount of that loan is theoretically brought into circulation to add to the amount in circulation; but you are paying back the principle plus interest. The additional interest is not created and this means that with every 'loan' there is a shortfall in the money in circulation between what is borrowed and what has to be paid back. There is never even close to enough money in circulation to repay all outstanding public and private debt including interest. Coldly weaved in the very fabric of the system is the certainty that some will lose their homes, businesses and possessions to the banking 'lender'. This is less obvious in times of 'boom' when the amount of money in circulation (and the debt) is expanding through more people wanting and getting loans. When a downturn comes and the money supply contracts it becomes painfully obvious that there is not enough money to service all debt and interest. This is less obvious in times of 'boom' when



the amount of money in circulation (and the debt) is expanding through more people wanting and getting loans. When a downturn comes and the money supply contracts and it becomes painfully obvious – as in 2008 and currently – that there is not enough money to service all debt and interest. Sabbatian bankers have been leading the human population through a calculated series of booms (more debt incurred) and busts (when the debt can't be repaid and the banks get the debtor's tangible wealth in exchange for non-existent 'credit'). With each 'bust' Sabbatian bankers have absorbed more of the world's tangible wealth and we end up with the One-percent. Governments are in bankruptcy levels of debt to the same system and are therefore owned by a system they do not control. The Federal Reserve, 'America's central bank', is privately-owned and American presidents only nominally appoint its chairman or woman to maintain the illusion that it's an arm of government. It's not. The 'Fed' is a cartel of private banks which handed billions to its associates and friends after the crash of 2008 and has been Sabbatian- controlled since it was manipulated into being in 1913 through the covert trickery of Rothschild banking agents Jacob Schiff and Paul Warburg, and the Sabbatian Rockefeller family. Somehow from a Jewish population of two-percent and globally 0.2 percent (Sabbatian interlopers remember are far smaller) ultra-Zionists headed the Federal Reserve for 31 years between 1987 and 2018 in the form of Alan Greenspan, Bernard Bernanke and Janet Yellen (now Biden's Treasury Secretary) with Yellen's deputy chairman a Israeli- American dual citizen and ultra-Zionist Stanley Fischer, a former governor of the Bank of Israel. Ultra-Zionist Fed chiefs spanned the presidencies of Ronald Reagan ('Republican'), Father George Bush ('Republican'), Bill Clinton ('Democrat'), Boy George Bush ('Republican') and Barack Obama ('Democrat'). We should really add the pre-Greenspan chairman, Paul Adolph Volcker, 'appointed' by Jimmy Carter ('Democrat') who ran the Fed between 1979 and 1987 during the Carter and Reagan administrations before Greenspan took over. Volcker was a long-time associate and business partner of the Rothschilds. No matter what the 'party' officially in power the United States economy was directed by the same force. Here are members of the Obama, Trump and Biden administrations and see if you can make out a

common theme. Barack Obama ('Democrat') Ultra-Zionists Robert Rubin, Larry Summers, and Timothy Geithner ran the US Treasury in the Clinton administration and two of them reappeared with Obama. Ultra-Zionist Fed chairman Alan Greenspan had manipulated the crash of 2008 through deregulation and jumped ship just before the disaster to make way for ultra- Zionist Bernard Bernanke to hand out trillions to Sabbatian 'too big to fail' banks and businesses, including the ubiquitous ultra-Zionist Goldman Sachs which has an ongoing staff revolving door operation between itself and major financial positions in government worldwide. Obama inherited the fallout of the crash when he took office in January, 2009, and fortunately he had the support of his ultra-Zionist White House Chief of Staff Rahm Emmanuel, son of a terrorist who helped to bomb Israel into being in 1948, and his ultra- Zionist senior adviser David Axelrod, chief strategist in Obama's two successful presidential campaigns. Emmanuel, later mayor of Chicago and former senior fundraiser and strategist for Bill Clinton, is an example of the Sabbatian policy aĝer Israel was established of migrating insider families to America so their children would be born American citizens. 'Obama' chose this financial team throughout his administration to respond to the Sabbatian-instigated Timothy Geithner (ultra-Zionist) Treasury Secretary; Jacob J. Lew, Treasury Secretary; Larry Summers (ultra-Zionist), director of the White House National Economic Council; Paul Adolph Volcker (Rothschild business partner), chairman of the Economic Recovery Advisory Board; Peter Orszag (ultra-Zionist), director of the Office of Management and Budget overseeing all government spending; Penny Pritzker (ultra-Zionist), Commerce Secretary; Jared Bernstein (ultra-Zionist), chief economist and economic policy adviser to Vice President Joe Biden; Mary Schapiro (ultra-Zionist), chair of the Securities and Exchange Commission (SEC); Gary Gensler (ultra- Zionist), chairman of the Commodity Futures Trading Commission (CFTC); Sheila Bair (ultra-Zionist), chair of the Federal Deposit Insurance Corporation (FDIC); Karen Mills (ultra-Zionist), head of the Small Business Administration (SBA); Kenneth Feinberg (ultra-Zionist), Special Master for Executive [bail-out] Compensation. Feinberg would be appointed to oversee compensation (with strings) to 9/11 victims and families in a campaign to stop them

having their day in court to question the official story. At the same time ultra- Zionist Bernard Bernanke was chairman of the Federal Reserve and these are only some of the ultra-Zionists with allegiance to Sabbatian-controlled Israel in the Obama government. Obama's biggest corporate donor was ultra-Zionist Goldman Sachs which had employed many in his administration. Donald Trump ('Republican') Trump claimed to be an outsider (he wasn't) who had come to 'drain the swamp'. He embarked on this goal by immediately appointing ultra-Zionist Steve Mnuchin, a Goldman Sachs employee for 17 years, as his Treasury Secretary. Others included Gary Cohn (ultra- Zionist), chief operating officer of Goldman Sachs, his first Director of the National Economic Council and chief economic adviser, who was later replaced by Larry Kudlow (ultra-Zionist). Trump's senior adviser throughout his four years in the White House was his sinister son-in-law Jared Kushner, a life-long friend of Israel Prime Minister Benjamin Netanyahu. Kushner is the son of a convicted crook who was pardoned by Trump in his last days in office. Other ultra-Zionists in the Trump administration included: Stephen Miller, Senior Policy Adviser; Avrahm Berkowitz, Deputy Adviser to Trump and his Senior Adviser Jared Kushner; Ivanka Trump, Adviser to the President, who converted to Judaism when she married Jared Kushner; David Friedman, Trump lawyer and Ambassador to Israel; Jason Greenblatt, Trump Organization executive vice president and chief legal officer, who was made Special Representative for International Negotiations and the Israeli-Palestinian Conflict; Rod Rosenstein, Deputy Attorney General; Elliot Abrams, Special Representative for Venezuela, then Iran; John Eisenberg, National Security Council Legal Adviser and Deputy Council to the President for National Security Affairs; Anne Neuberger, Deputy National Manager, National Security Agency; Ezra Cohen-Watnick, Acting Under Secretary of Defense for Intelligence; Elan Carr, Special Envoy to monitor and combat anti-Semitism; Len Khodorkovsky, Deputy Special Envoy to monitor and combat anti-Semitism; Reed Cordish, Assistant to the President, Intragovernmental and Technology Initiatives. Trump Vice President Mike Pence and Secretary of State Mike Pompeo, both Christian Zionists, were also vehement supporters of Israel and its goals and ambitions. Donald 'free-speech

believer' Trump pardoned a number of financial and violent criminals while ignoring calls to pardon Julian Assange and Edward Snowden whose crimes are revealing highly relevant information about government manipulation and corruption and the widespread illegal surveillance of the American people by US 'security' agencies. It's so good to know that Trump is on the side of freedom and justice and not mega-criminals with allegiance to Sabbatian-controlled Israel. These included a pardon for Israeli spy Jonathan Pollard who was jailed for life in 1987 under the Espionage Act. Aviem Sella, the Mossad agent who recruited Pollard, was also pardoned by Trump while Assange sat in jail and Snowden remained in exile in Russia. Sella had 'fled' (was helped to escape) to Israel in 1987 and was never extradited despite being charged under the Espionage Act. A Trump White House statement said that Sella's clemency had been 'supported by Benjamin Netanyahu, Ron Dermer, Israel's US Ambassador, David Friedman, US Ambassador to Israel and Miriam Adelson, wife of leading Trump donor Sheldon Adelson who died shortly before. Other friends of Jared Kushner were pardoned along with Sholom Weiss who was believed to be serving the longest-ever white-collar prison sentence of more than 800 years in 2000. The sentence was commuted of Ponzi-schemer Eliyahu Weinstein who defrauded Jews and others out of \$200 million. I did mention that Assange and Snowden were ignored, right? Trump gave Sabbatians almost everything they asked for in military and political support, moving the US Embassy from Tel Aviv to Jerusalem with its critical symbolic and literal implications for Palestinian statehood, and the 'deal of the Century' designed by Jared Kushner and David Friedman which gave the Sabbatian Israeli government the green light to substantially expand its already widespread program of building illegal Jewish-only settlements in the occupied land of the West Bank. This made a two-state 'solution' impossible by seizing all the land of a potential Palestinian homeland and that had been the plan since 1948 and then 1967 when the Arab-controlled Gaza Strip, West Bank, Sinai Peninsula and Syrian Golan Heights were occupied by Israel. All the talks about talks and road maps and delays have been buying time until the West Bank was physically occupied by Israeli real estate. Trump would have to be a monumentally

ill-informed idiot not to see that this was the plan he was helping to complete. The Trump administration was in so many ways the Kushner administration which means the Netanyahu administration which means the Sabbatian administration. I understand why many opposing Cult fascism in all its forms gravitated to Trump, but he was a crucial part of the Sabbatian plan and I will deal with this in the next chapter. Joe Biden ('Democrat') A barely cognitive Joe Biden took over the presidency in January, 2021, along with his fellow empty shell, Vice-President Kamala Harris, as the latest Sabbatian gofers to enter the White House. Names on the door may have changed and the 'party' – the force behind them remained the same as Zionists were appointed to a stream of pivotal areas relating to Sabbatian plans and policy. They included: Janet Yellen, Treasury Secretary, former head of the Federal Reserve, and still another ultra-Zionist running the US Treasury after Mnuchin (Trump), Lew and Geithner (Obama), and Summers and Rubin (Clinton); Anthony Blinken, Secretary of State; Wendy Sherman, Deputy Secretary of State (so that's 'Biden's' Sabbatian foreign policy sorted); Jeff Zients, White House coronavirus coordinator; Rochelle Walensky, head of the Centers for Disease Control; Rachel Levine, transgender deputy health secretary (that's 'Covid' hoax policy under control); Merrick Garland, Attorney General; Alejandro Mayorkas, Secretary of Homeland Security; Cass Sunstein, Homeland Security with responsibility for new immigration laws; Avril Haines, Director of National Intelligence; Anne Neuberger, National Security Agency cybersecurity director (note, cybersecurity); David Cohen, CIA Deputy Director; Ronald Klain, Biden's Chief of Staff (see Rahm Emanuel); Eric Lander, a 'leading geneticist', Office of Science and Technology Policy director (see Smart Grid, synthetic biology agenda); Jessica Rosenworcel, acting head of the Federal Communications Commission (FCC) which controls Smart Grid technology policy and electromagnetic communication systems including 5G. How can it be that so many pivotal positions are held by two-percent of the American population and 0.2 percent of the world population administration after administration no matter who is the president and what is the party? It's a coincidence? Of course it's not and this is why Sabbatians have built their colossal global web of interlocking 'anti- hate' hate groups to

condemn anyone who asks these glaring questions as an 'anti-Semite'. The way that Jewish people horrifically abused in Sabbatian-backed Nazi Germany are exploited to this end is stomach-turning and disgusting beyond words. Sabbatian manipulation has reversed the roles of Republicans and Democrats and the same has happened in Britain with the Conservative and Labour Parties. Republicans and Conservatives were always labelled the 'right' and Democrats and Labour the 'left', but look at the policy positions now and the Democrat-Labour 'left' has moved further to the 'right' than Republicans and Conservatives under the banner of 'Woke', the Cult-created far-right tyranny. Where once the Democrat-Labour 'left' defended free speech and human rights they now seek to delete them and as I said earlier despite the 'Covid' fascism of the Jackboot Johnson Conservative government in the UK the Labour Party of leader Keir Starmer demanded even more extreme measures. The Labour Party has been very publicly absorbed by Sabbatians after a political and media onslaught against the previous leader, the weak and inept Jeremy Corbyn, over made-up allegations of 'anti-Semitism' both by him and his party. The plan was clear with this 'anti-Semite' propaganda and what was required in response was a swift and decisive 'fuck off' from Corbyn and a statement to expose the Anti-Semitism Industry (Sabbatian) attempt to silence Labour criticism of the Israeli government (Sabbatians) and purge the party of all dissent against the extremes of ultra-Zionism (Sabbatians). Instead Corbyn and his party fell to their knees and appeased the abusers which, by definition, is impossible. Appeasing one demand leads only to a new demand to be appeased until takeover is complete. Like I say – 'fuck off' would have been a much more effective policy and I have used it myself with great effect over the years when Sabbatians are on my case which is most of the time. I consider that fact a great compliment, by the way. The outcome of the Labour Party capitulation is that we now have a Sabbatian-controlled Conservative Party 'opposed' by a Sabbatian-controlled Labour Party in a one-party Sabbatian state that hurtles towards the extremes of tyranny (the Sabbatian cult agenda). In America the situation is the same. Labour's Keir Starmer spends his days on his knees with his tongue out pointing to Tel Aviv, or I guess now Jerusalem, while

Boris Johnson has an 'anti-Semitism czar' in the form of former Labour MP John Mann who keeps Starmer company on his prayer mat. Sabbatian influence can be seen in Jewish members of the Labour Party who have been ejected for criticism of Israel including those from families that suffered in Nazi Germany. Sabbatians despise real Jewish people and target them even more harshly because it is so much more difficult to dub them 'anti-Semitic' although in their desperation they do try. The Pushbacker sting Until you realize how easy it is for your mind to be manipulated, you remain the puppet of someone else's game will use the presidencies of Trump and Biden to show how the manipulation of the one-party state plays out behind the illusion of political choice across the world. No two presidencies could – on the face of it – be more different and apparently at odds in terms of direction and policy. A Renegade Mind sees beyond the obvious and focuses on outcomes and consequences and not image, words and waffle. The Cult embarked on a campaign to divide America between those who blindly support its agenda (the mentality known as 'Woke') and those who are pushing back on where the Cult and its Sabbatians want to go. This presents infinite possibilities for dividing and ruling the population by seîing them at war with each other and allows a perceptual ring fence of demonisation to encircle the Pushbackers in a modern version of the Liîle Big Horn in 1876 when American cavalry led by Lieutenant Colonel George Custer were drawn into a trap, surrounded and killed by Native American tribes defending their land of thousands of years from being seized by the government. In this modern version the roles are reversed and it's those defending themselves from the Sabbatian government who are surrounded and the government that's seeking to destroy them. This trap was set years ago and to explain how we must return to 2016 and the emergence of Donald Trump as a candidate to be President of the United States. He set out to overcome the best part of 20 other candidates in the Republican Party before and during the primaries and was not considered by many in those early stages to have a prayer of living in the White House. The Republican Party was said to have great reservations about Trump and yet somehow he won the nomination. When you know how American politics works – politics in general – there is no

way that Trump could have become the party's candidate unless the Sabbatian-controlled 'Neocons' that run the Republican Party wanted that to happen. We saw the proof in emails and documents made public by WikiLeaks that the Democratic Party hierarchy, or Democons, systematically undermined the campaign of Bernie Sanders to make sure that Sabbatian gofer Hillary Clinton won the nomination to be their presidential candidate. If the Democons could do that then the Neocons in the Republican Party could have derailed Trump in the same way. But they didn't and at that stage I began to conclude that Trump could well be the one chosen to be president. If that was the case the 'why' was prety clear to see – the goal of dividing America between Cult agenda-supporting Wokers and Pushbackers who gravitated to Trump because he was telling them what they wanted to hear. His constituency of support had been increasingly ignored and voiceless for decades and profoundly through the eight years of Sabbatian puppet Barack Obama. Now here was someone speaking their language of pulling back from the incessant globalisation of political and economic power, the exporting of American jobs to China and elsewhere by 'American' (Sabbatian) corporations, the deletion of free speech, and the mass immigration policies that had further devastated job opportunities for the urban working class of all races and the once American heartlands of the Midwest. Beware the forked tongue Those people collectively sighed with relief that at last a political leader was apparently on their side, but another trait of the Renegade Mind is that you look even harder at people telling you what you want to hear than those who are telling you otherwise. Obviously as I said earlier people wish what they want to hear to be true and genuine and they are much more likely to believe that than someone saying what they don't want to hear and don't want to be true. Sales people are taught to be skilled in eliciting by calculated questioning what their customers want to hear and repeating that back to them as their own opinion to get their targets to like and trust them. Assets of the Cult are also sales people in the sense of selling perception. To read Cult manipulation you have to play the long and expanded game and not fall for the Vaudeville show of party politics. Both American parties are vehicles for the Cult and they exploit them in different ways depending on what



the agenda requires at that moment. Trump and the Republicans were used to be the focus of dividing America and isolating Pushbackers to open the way for a Biden presidency to become the most extreme in American history by advancing the full-blown Woke (Cult) agenda with the aim of destroying and silencing Pushbackers now labelled Nazi Trump supporters and white supremacists. Sabbatians wanted Trump in office for the reasons described by ultra-Zionist Saul Alinsky (1909-1972) who was promoting the Woke philosophy through 'community organising' long before anyone had heard of it. In those days it still went by its traditional name of Marxism. The reason for the manipulated Trump phenomenon was laid out in Alinsky's 1971 book, *Rules for Radicals*, which was his blueprint for overthrowing democratic and other regimes and replacing them with Sabbatian Marxism. Not surprisingly his to-do list was evident in the Sabbatian French and Russian 'Revolutions' and that in China which will become very relevant in the next chapter about the 'Covid' hoax. Among Alinsky's followers have been the deeply corrupt Barack Obama, House Speaker Nancy Pelosi and Hillary Clinton who described him as a 'hero'. All three are Sabbatian stooges with Pelosi personifying the arrogant corrupt idiocy that so widely fronts up for the Cult inner core. Predictably as a Sabbatian advocate of the 'light-bringer' Alinsky features Lucifer on the dedication page of his book as the original radical who gained his own kingdom ('Earth' as we shall see). One of Alinsky's golden radical rules was to pick an individual and focus all attention, hatred and blame on them and not to target faceless bureaucracies and corporations. *Rules for Radicals* is really a Sabbatian handbook with its contents repeatedly employed all over the world for centuries and why wouldn't Sabbatians bring to power their designer-villain to be used as the individual on which all attention, hatred and blame was bestowed? This is what they did and the only question for me is how much Trump knew that and how much he was manipulated. A bit of both, I suspect. This was Alinsky's Trump technique from a man who died in 1972. The technique has spanned history: Pick the target, freeze it, personalize it, polarize it. Don't try to attack abstract corporations or bureaucracies. Identify a responsible individual. Ignore attempts to shift or spread the blame. From the moment Trump came to

illusory power everything was about him. It wasn't about Republican policy or opinion, but all about Trump. Everything he did was presented in negative, derogatory and abusive terms by the Sabbatian-dominated media led by Cult operations such as CNN, MSNBC, The New York Times and the Jeff Bezos-owned Washington Post – 'Pick the target, freeze it, personalize it, polarize it.' Trump was turned into a demon to be vilified by those who hated him and a demi-god loved by those who worshipped him. This, in turn, had his supporters, too, presented as equally demonic in preparation for the punchline later down the line when Biden was about to take office. It was here's a Trump, there's a Trump, everywhere a Trump, Trump. Virtually every news story or happening was filtered through the lens of 'The Donald'. You loved him or hated him and which one you chose was said to define you as Satan's spawn or a paragon of virtue. Even supporting some Trump policies or statements and not others was enough for an assault on your character. No shades of grey were or are allowed. Everything is black and white (literally and figuratively). A Californian I knew had her head utterly scrambled by her hatred for Trump while telling people they should love each other. She was so totally consumed by Trump Derangement Syndrome as it became to be known that this glaring contradiction would never have occurred to her. By definition anyone who criticised Trump or praised his opponents was a hero and this lady described Joe Biden as 'a kind, honest gentleman' when he's a provable liar, mega-crook and vicious piece of work to boot. Sabbatians had indeed divided America using Trump as the fall-guy and all along the clock was ticking on the consequences for his supporters. In hock to his masters Trump gave Sabbatians via Israel almost everything they wanted in his four years. Ask and you shall receive was the dynamic between himself and Benjamin Netanyahu orchestrated by Trump's ultra-Zionist son-in-law Jared Kushner, his ultra-Zionist Ambassador to Israel, David Friedman, and ultra-Zionist 'Israel adviser', Jason Greenblatt. The last two were central to the running and protecting from collapse of his business empire, the Trump Organisation, and colossal business failures made him forever beholden to Sabbatian networks that bailed him out. By the start of the 1990s Trump owed \$4 billion to banks that he couldn't pay and almost \$1 billion

of that was down to him personally and not his companies. This mega- disaster was the result of building two new casinos in Atlantic City and buying the enormous Taj Mahal operation which led to crippling debt payments. He had borrowed fantastic sums from 72 banks with major Sabbatian connections and although the scale of debt should have had him living in a tent alongside the highway they never foreclosed. A plan was devised to lift Trump from the mire by BT Securities Corporation and Rothschild Inc. and the case was handled by Wilber Ross who had worked for the Rothschilds for 27 years. Ross would be named US Commerce Secretary after Trump's election. Another crucial figure in saving Trump was ultra- Zionist 'investor' Carl Icahn who bought the Taj Mahal casino. Icahn was made special economic adviser on financial regulation in the Trump administration. He didn't stay long but still managed to find time to make a tidy sum of a reported \$31.3 million when he sold his holdings affected by the price of steel three days before Trump imposed a 235 percent tariff on steel imports. What amazing bits of luck these people have. Trump and Sabbatian operatives have long had a close association and his mentor and legal adviser from the early 1970s until 1986 was the dark and genetically corrupt ultra- Zionist Roy Cohn who was chief counsel to Senator Joseph McCarthy's 'communist' witch-hunt in the 1950s. Esquire magazine published an article about Cohn with the headline 'Don't mess with Roy Cohn'. He was described as the most feared lawyer in New York and 'a ruthless master of dirty tricks ... [with] ... more than one Mafia Don on speed dial'. Cohn's influence, contacts, support and protection made Trump a front man for Sabbatians in New York with their connections to one of Cohn's many criminal employers, the 'Russian' Sabbatian Mafia. Israel-centric media mogul Rupert Murdoch was introduced to Trump by Cohn and they started a long friendship. Cohn died in 1986 weeks after being disbarred for unethical conduct by the Appellate Division of the New York State Supreme Court. The wheels of justice do indeed run slow given the length of Cohn's crooked career. We are asked to believe that Donald Trump with his fundamental connections to Sabbatian networks and operatives has been leading the fight to stop the Sabbatian agenda for the fascistic control of America and the world. Sure he has. A man entrapped

during his years in the White House by Sabbatian operatives and whose biggest financial donor was casino billionaire Sheldon Adelson who was Sabbatian to his DNA?? Oh, do come on. Trump has been used to divide America and isolate Pushbackers on the Cult agenda under the heading of 'Trump supporters', 'insurrectionists' and 'white supremacists'. The US Intelligence/Mossad Psyop or psychological operation known as QAnon emerged during the Trump years as a central pillar in the Sabbatian campaign to lead Pushbackers into the trap set by those that wished to destroy them. I knew from the start that QAnon was a scam because I had seen the same scenario many times before over 30 years under different names and I had written about one in particular in the books. 'Not again' was my reaction when QAnon came to the fore. The same script is pulled out every few years and a new name added to the leîerhead. The story always takes the same form: 'Insiders' or 'the good guys' in the government- intelligence-military 'Deep State' apparatus were going to instigate mass arrests of the 'bad guys' which would include the Rockefellers, Rothschilds, Barack Obama, Hillary Clinton, George Soros, etc., etc. Dates are given for when the 'good guys' are going to move in, but the dates pass without incident and new dates are given which pass without incident. The central message to Pushbackers in each case is that they don't have to do anything because there is 'a plan' and it is all going to be sorted by the 'good guys' on the inside. 'Trust the plan' was a QAnon mantra when the only plan was to misdirect Pushbackers into puîing their trust in a Psyop they believed to be real. Beware, beware, those who tell you what you want to hear and always check it out. Right up to Biden's inauguration QAnon was still claiming that 'the Storm' was coming and Trump would stay on as president when Biden and his cronies were arrested and jailed. It was never going to happen and of course it didn't, but what did happen as a result provided that punchline to the Sabbatian On January 6th, 2021, a very big crowd of Trump supporters gathered in the National Mall in Washington DC down from the Capitol Building to protest at what they believed to be widespread corruption and vote fraud that stopped Trump being re-elected for a second term as president in November, 2020. I say as someone that does not support Trump or Biden that the evidence is clear that major

vote-fixing went on to favour Biden, a man with cognitive problems so advanced he can often hardly string a sentence together without reading the words written for him on the Teleprompter. Glaring ballot discrepancies included serious questions about electronic voting machines that make vote rigging a comparative cinch and hundreds of thousands of paper votes that suddenly appeared during already advanced vote counts and virtually all of them for Biden. Early Trump leads in crucial swing states suddenly began to close and disappear. The pandemic hoax was used as the excuse to issue almost limitless numbers of mail-in ballots with no checks to establish that the recipients were still alive or lived at that address. They were sent to streams of people who had not even asked for them. Private organisations were employed to gather these ballots and who knows what they did with them before they turned up at the counts. The American election system has been manipulated over decades to become a sick joke with more holes than a Swiss cheese for the express purpose of dictating the results. Then there was the criminal manipulation of information by Sabbatian tech giants like Facebook, Twitter and Google-owned YouTube which deleted pro-Trump, anti-Biden accounts and posts while everything in support of Biden was left alone. Sabbatians wanted Biden to win because after the dividing of America it was time for full-on Woke and every aspect of the Cult agenda to be Extreme Silicon Valley bias included blocking information by the New York Post exposing a Biden scandal that should have ended his bid for president in the final weeks of the campaign. Hunter Biden, his monumentally corrupt son, is reported to have sent a laptop to be repaired at a local store and failed to return for it. Time passed until the laptop became the property of the store for non-payment of the bill. When the owner saw what was on the hard drive he gave a copy to the FBI who did nothing even though it confirmed widespread corruption in which the Joe Biden family were using his political position, especially when he was vice president to Obama, to make multiple millions in countries around the world and most notably Ukraine and China. Hunter Biden's one-time business partner Tony Bobulinski went public when the story broke in the New York Post to confirm the corruption he saw and that Joe Biden not only knew what was going on he also

profited from the spoils. Millions were handed over by a Chinese company with close connections – like all major businesses in China – to the Chinese communist party of President Xi Jinping. Joe Biden even boasted at a meeting of the Cult's World Economic Forum that as vice president he had ordered the government of Ukraine to fire a prosecutor. What he didn't mention was that the same man just happened to be investigating an energy company which was part of Hunter Biden's corrupt portfolio. The company was paying him big bucks for no other reason than the influence his father had. Overnight Biden's presidential campaign should have been over given that he had lied the entire Sabbatian-owned mainstream media and Sabbatian- owned Silicon Valley suppressed circulation of the story. This alone went a mighty way to rigging the election of 2020. Cult assets like Mark Zuckerberg at Facebook also spent hundreds of millions to be used in support of Biden and vote 'administration'. The Cult had used Trump as the focus to divide America and was now desperate to bring in moronic, pliable, corrupt Biden to complete the double-whammy. No way were they going to let little things like the will of the people thwart their plan. Silicon Valley widely censored claims that the election was rigged because it was rigged. For the same reason anyone claiming it was rigged was denounced as a 'white supremacist' including the pathetically few Republican politicians willing to say so. Right across the media where the claim was mentioned it was described as a 'false claim' even though these excuses for 'journalists' would have done no research into the subject whatsoever. Trump won seven million more votes than any sitting president had ever achieved while somehow a cognitively-challenged soon to be 78-year-old who was hidden away from the public for most of the campaign managed to win more votes than any presidential candidate in history. It makes no sense. You only had to see election rallies for both candidates to witness the enthusiasm for Trump and the apathy for Biden. Tens of thousands would attend Trump events while Biden was speaking in empty car parks with often only television crews attending and framing their shots to hide the fact that no one was there. It was pathetic to see footage come to light of Biden standing at a podium making speeches only to TV crews and party fixers while reading the words written for him on massive

Teleprompter screens. So, yes, those protestors on January 6th had a point about election rigging, but some were about to walk into a trap laid for them in Washington by the Cult Deep State and its QAnon Psyop. This was the Capitol Hill riot ludicrously dubbed an 'insurrection'. The spider and the fly Renegade Minds know there are not two 'sides' in politics, only one side, the Cult, working through all 'sides'. It's a stage show, a puppet show, to direct the perceptions of the population into focusing on diversions like parties and candidates while missing the puppeteers with their hands holding all the strings. The Capitol Hill 'insurrection' brings us back to the Little Big Horn. Having created two distinct opposing groupings – Woke and Pushbackers – the trap was about to be sprung. Pushbackers were to be encircled and isolated by associating them all in the public mind with Trump and then labelling Trump as some sort of Confederate leader. I knew immediately that the Capitol riot was a set-up because of two things. One was how easy the rioters got into the building with virtually no credible resistance and secondly I could see – as with the 'Covid' hoax in the West at the start of 2020 – how the Cult could exploit the situation to move its agenda forward with great speed. My experience of Cult techniques and activities over more than 30 years has showed me that while they do exploit situations they haven't themselves created this never happens with events of fundamental agenda significance. Every time major events giving cultists the excuse to rapidly advance their plan you find they are manipulated into being for the specific reason of providing that excuse – Problem- Reaction-Solution. Only a tiny minority of the huge crowd of Washington protestors sought to gain entry to the Capitol by smashing windows and breaching doors. That didn't matter. The whole crowd and all Pushbackers, even if they did not support Trump, were going to be lumped together as dangerous insurrectionists and conspiracy theorists. The latter term came into widespread use through a CIA memo in the 1960s aimed at discrediting those questioning the nonsensical official story of the Kennedy assassination and it subsequently became widely employed by the media. It's still being used by inept 'journalists' with no idea of its origin to discredit anyone questioning anything that authority claims to be true. When you are perpetrating a conspiracy you need to discredit the

very word itself even though the dictionary definition of conspiracy is merely 'the activity of secretly planning with other people to do something bad or illegal' and 'a general agreement to keep silent about a subject for the purpose of keeping it secret'. On that basis there are conspiracies almost wherever you look. For obvious reasons the Cult and its lapdog media have to claim there are no conspiracies even though the word appears in state laws as with conspiracy to defraud, to murder, and to corrupt public morals. Agent provocateurs are widely used by the Cult Deep State to manipulate genuine people into acting in ways that suit the desired outcome. By genuine in this case I mean protestors genuinely supporting Trump and claims that the election was stolen. In among them, however, were agents of the state wearing the garb of Trump supporters and QAnon to pump-prime the Capital riot which some genuine Trump supporters naively fell for. I described the situation as 'Come into my parlour said the spider to the fly'. Leaflets appeared through the Woke paramilitary arm Antifa, the anti-fascist fascists, calling on supporters to turn up in Washington looking like Trump supporters even though they hated him. Some of those arrested for breaching the Capitol Building were sourced to Antifa and its stable mate Black Lives Maîer. Both organisations are funded by Cult billionaires and corporations. One man charged for the riot was according to his lawyer a former FBI agent who had held top secret security clearance for 40 years. Aîorney Thomas Plofchan said of his client, 66-year-old Thomas Edward Caldwell: He has held a Top Secret Security Clearance since 1979 and has undergone multiple Special Background Investigations in support of his clearances. After retiring from the Navy, he worked as a section chief for the Federal Bureau of Investigation from 2009-2010 as a GS-12 He also formed and operated a consulting firm performing work, often classified, for U.S government customers including the US. Drug Enforcement Agency, Department of Housing and Urban Development, the US Coast Guard, and the US Army Personnel Command. A judge later released Caldwell pending trial in the absence of evidence about a conspiracy or that he tried to force his way into the building. The New York Post reported a 'law enforcement source' as saying that 'at least two known Antifa members were spoîed' on camera among Trump



supporters during the riot while one of the rioters arrested was John Earle Sullivan, a seriously extreme Black Lives Matter Trump-hater from Utah who was previously arrested and charged in July, 2020, over a BLM-Antifa riot in which drivers were threatened and one was shot. Sullivan is the founder of Utah-based Insurgence USA which is an affiliate of the Cult-created-and-funded Black Lives Matter movement. Footage appeared and was then deleted by Twitter of Trump supporters calling out Antifa infiltrators and a group was filmed changing into pro-Trump clothing before the riot. Security at the building was pathetic – as planned. Colonel Leroy Fletcher Prouty, a man with long experience in covert operations working with the US security apparatus, once described the tell-tale sign to identify who is involved in an assassination. He said: No one has to direct an assassination – it happens. The active role is played secretly by permitting it to happen. This is the greatest single clue. Who has the power to call off or reduce the usual security precautions? This principle applies to many other situations and certainly to the Capitol riot of January 6th, 2021. With such a big and potentially angry crowd known to be gathering near the Capitol the security apparatus would have had a major police detail to defend the building with National Guard troops on standby given the strength of feeling among people arriving from all over America encouraged by the QAnon Psyop and statements by Donald Trump. Instead Capitol Police 'security' was flimsy, weak, and easily breached. The same number of officers was deployed as on a regular day and that is a blatant red flag. They were not staffed or equipped for a possible riot that had been an obvious possibility in the circumstances. No protective and effective fencing worth the name was put in place and there were no contingency plans. The whole thing was basically a case of standing aside and waving people in. Once inside police mostly backed off apart from one Capitol police officer who ridiculously shot dead unarmed Air Force veteran protestor Ashli Babbitt without a warning as she climbed through a broken window. The 'investigation' refused to name or charge the officer after what must surely be considered a murder in the circumstances. They just laid a carpet and swept. The story was endlessly repeated about five people dying in the 'armed insurrection' when there was no

report of rioters using weapons. Apart from Babbij the other four died from a jack, strokes and apparently a drug overdose. Capitol police officer Brian Sicknick was reported to have died after being bludgeoned with a fire extinguisher when he was alive after the riot was over and died later of what the Washington Medical Examiner's Office said was a stroke. Sicknick had no external injuries. The lies were delivered like rapid fire. There was a narrative to build with incessant repetition of the lie until the lie became the accepted 'everybody knows that' truth. The 'Big Lie' technique of Nazi Propaganda Minister Joseph Goebbels is constantly used by the Cult which was behind the Nazis and is today behind the 'Covid' and 'climate change' hoaxes. Goebbels If you tell a lie big enough and keep repeating it, people will eventually come to believe it. The lie can be maintained only for such time as the State can shield the people from the political, economic and/or military consequences of the lie. It thus becomes vitally important for the State to use all of its powers to repress dissent, for the truth is the mortal enemy of the lie, and thus by extension, the truth is the greatest enemy of the State. Most protestors had a free run of the Capitol Building. This allowed pictures to be taken of rioters in iconic parts of the building including the Senate chamber which could be used as propaganda images against all Pushbackers. One Congresswoman described the scene as 'the worst kind of non-security anybody could ever imagine'. Well, the first part was true, but someone obviously did imagine it and made sure it happened. Some photographs most widely circulated featured people wearing QAnon symbols and now the Psyop would be used to dub all QAnon followers with the ubiquitous fit-all label of 'white supremacist' and 'insurrectionists'. When a Muslim extremist called Noah Green drove his car at two police officers at the Capitol Building killing one in April, 2021, there was no such political and media hysteria. They were just disappointed he wasn't white. Government prosecutor Michael Sherwin, an aggressive, dark-eyed, professional Rojeweler led the 'investigation' and to call it over the top would be to understate reality a thousand fold. Hundreds were tracked down and arrested for the crime of having the wrong political views and people were jailed who had done nothing more than walk in the building, committed no violence or damage to property,

took a few pictures and leŕ. They were labelled a 'threat to the Republic' while Biden sat in the White House signing executive orders wriŕen for him that were dismantling 'the Republic'. Even when judges ruled that a mother and son should not be in jail the government kept them there. Some of those arrested have been badly beaten by prison guards in Washington and lawyers for one man said he suffered a fractured skull and was made blind in one eye. Meanwhile a woman is shot dead for no reason by a Capitol Police officer and we are not allowed to know who he is never mind what has happened to him although that will be nothing. The Cult's QAnon/Trump sting to identify and isolate Pushbackers and then target them on the road to crushing and deleting them was a resounding success. You would have thought the Russians had invaded the building at gunpoint and lined up senators for a firing squad to see the political and media reaction. Congresswoman Alexandria Ocasio-Cortez is a child in a woman's body, a terrible- twos, me, me, me, Woker narcissist of such proportions that words have no meaning. She said she thought she was going to die when 'insurrectionists' banged on her office door. It turned out she wasn't even in the Capitol Building when the riot was happening and the 'banging' was a Capitol Police officer. She referred to herself as a 'survivor' which is an insult to all those true survivors of violent and sexual abuse while she lives her pampered and privileged life talking drivell for a living. Her Woke colleague and fellow mega- narcissist Rashida Tlaib broke down describing the devastating effect on her, too, of not being in the building when the rioters were there. Ocasio-Cortez and Tlaib are members of a fully-Woke group of Congresswomen known as 'The Squad' along with Ilhan Omar and Ayanna Pressley. The Squad from what I can see can be identified by its vehement anti-white racism, anti-white men agenda, and, as always in these cases, the absence of brain cells on active The usual suspects were on the riot case immediately in the form of Democrat ultra-Zionist senators and operatives Chuck Schumer and Adam Schiff demanding that Trump be impeached for 'his part in the insurrection'. The same pair of prats had led the failed impeachment of Trump over the invented 'Russia collusion' nonsense which claimed Russia had helped Trump win the 2016 election. I didn't

realise that Tel Aviv had been relocated just outside Moscow. I must find an up-to-date map. The Russia hoax was a Sabbatian operation to keep Trump occupied and impotent and to stop any rapport with Russia which the Cult wants to retain as a perceptual enemy to be pulled out at will. Puppet Biden began aĵacking Russia when he came to office as the Cult seeks more upheaval, division and war across the world. A two-year stage show 'Russia collusion inquiry' headed by the not-very-bright former 9/11 FBI chief Robert Mueller, with support from 19 lawyers, 40 FBI agents plus intelligence analysts, forensic accountants and other staff, devoured tens of millions of dollars and found no evidence of Russia collusion which a ten-year-old could have told them on day one. Now the same moronic Schumer and Schiff wanted a second impeachment of Trump over the Capitol 'insurrection' (riot) which the arrested development of Schumer called another 'Pearl Harbor' while others compared it with 9/11 in which 3,000 died and, in the case of CNN, with the Rwandan genocide in the 1990s in which an estimated 500,000 to 600,000 were murdered, between 250, 000 and 500,000 women were raped, and populations of whole towns were hacked to death with machetes. To make those comparisons purely for Cult political reasons is beyond insulting to those that suffered and lost their lives and confirms yet again the callous inhumanity that we are dealing with. Schumer is a monumental idiot and so is Schiff, but they serve the Cult agenda and do whatever they're told so they get looked aĜer. Talking of idiots – another inane man who spanned the Russia and Capitol impeachment aĵempts was Senator Eric Swalwell who had the nerve to accuse Trump of collusion with the Russians while sleeping with a Chinese spy called Christine Fang or 'Fang Fang' which is straight out of a Bond film no doubt starring Klaus Schwab as the bloke living on a secret island and controlling laser weapons positioned in space and pointing at world capitals. Fang Fang plays the part of Bond's infiltrator girlfriend which I'm sure she would enjoy rather more than sharing a bed with the brainless Swalwell, lying back and thinking of China. The FBI eventually warned Swalwell about Fang Fang which gave her time to escape back to the Chinese dictatorship. How very thoughtful of them. The second Trump impeachment also failed and hardly surprising when an impeachment is

supposed to remove a sitting president and by the time it happened Trump was no longer president. These people are running your country America, well, officially anyway. Terrifying isn't it? Outcomes tell the story - always The outcome of all this - and it's the outcome on which Renegade Minds focus, not the words - was that a vicious, hysterical and obviously pre-planned assault was launched on Pushbackers to censor, silence and discredit them and even targeted their right to earn a living. They have since been condemned as 'domestic terrorists' that need to be treated like Al-Qaeda and Islamic State. 'Domestic terrorists' is a label the Cult has been trying to make stick since the period of the Oklahoma bombing in 1995 which was blamed on 'far-right domestic terrorists'. If you read The Trigger you will see that the bombing was clearly a Problem-Reaction-Solution carried out by the Deep State during a Bill Clinton administration so corrupt that no dictionary definition of the term would even nearly suffice. Nearly 30, 000 troops were deployed from all over America to the empty streets of Washington for Biden's inauguration. Ten thousand of them stayed on with the pretext of protecting the capital from insurrectionists when it was more psychological programming to normalise the use of the military in domestic law enforcement in support of the Cult plan for a police-military state. Biden's fascist administration began a purge of 'wrong-thinkers' in the military which means anyone that is not on board with Woke. The Capitol Building was surrounded by a fence with razor wire and the Land of the Free was further symbolically and literally dismantled. The circle was completed with the installation of Biden and the exploitation of the QAnon Psyop. America had never been so divided since the civil war of the 19th century, Pushbackers were isolated and dubbed terrorists and now, as was always going to happen, the Cult immediately set about deleting what little was left of freedom and transforming American society through a swish of the hand of the most controlled 'president' in American history leading (officially at least) the most extreme regime since the country was declared an independent state on July 4th, 1776. Biden issued undebated, dictatorial executive orders almost by the hour in his opening days in office across the whole spectrum of the Cult wish-list including diluting controls on the border with Mexico allowing thousands of migrants

to illegally enter the United States to transform the demographics of America and import an election-changing number of perceived Democrat voters. Then there were Biden deportation amnesties for the already illegally resident (estimated to be as high as 20 or even 30 million). A bill before Congress awarded American citizenship to anyone who could prove they had worked in agriculture for just 180 days in the previous two years as 'Big Ag' secured its slave labour long-term. There were the plans to add new states to the union such as Puerto Rico and making Washington DC a state. They are all parts of a plan to ensure that the Cult-owned Woke Democrats would be permanently in power. Border – what border? I have exposed in detail in other books how mass immigration into the United States and Europe is the work of Cult networks fuelled by the tens of billions spent to this and other ends by George Soros and his global Open Society (open borders) Foundations. The impact can be seen in America alone where the population has increased by 100 million in little more than 30 years mostly through immigration. I wrote in *The Answer* that the plan was to have so many people crossing the southern border that the numbers become unstoppable and we are now there under Cult-owned Biden. El Salvador in Central America puts the scale of what is happening into context. A third of the population now lives in the United States, much of it illegally, and many more are on the way. The methodology is to crush Central and South American countries economically and spread violence through machete-wielding psychopathic gangs like MS-13 based in El Salvador and now operating in many American cities. Biden-imposed lax security at the southern border means that it is all but open. He said before his 'election' that he wanted to see a surge towards the border if he became president and that was the green light for people to do just that after election day to create the human disaster that followed for both America and the migrants. When that surge came the imbecilic Alexandria Ocasio-Cortez said it wasn't a 'surge' because they are 'children, not insurgents' and the term 'surge' (used by Biden) was a claim of 'white supremacists'. This disingenuous lady may one day enter the realm of the most basic intelligence, but it won't be any time soon. Sabbatians and the Cult are in the process of destroying America by importing violent people and gangs in among the

genuine to terrorise American cities and by overwhelming services that cannot cope with the sheer volume of new arrivals. Something similar is happening in Europe as Western society in general is targeted for demographic and cultural transformation and upheaval. The plan demands violence and crime to create an environment of intimidation, fear and division and Soros has been funding the election of district attorneys across America who then stop prosecuting many crimes, reduce sentences for violent crimes and free as many violent criminals as they can. Sabbatians are creating the chaos from which order – their order – can respond in a classic Problem-Reaction-Solution. A Freemasonic motto says 'Ordo Ab Chao' (Order out of Chaos) and this is why the Cult is constantly creating chaos to impose a new 'order'. Here you have the reason the Cult is constantly creating chaos. The 'Covid' hoax can be seen with those entering the United States by plane being forced to take a 'Covid' test while migrants flooding through southern border processing facilities do not. Nothing is put in the way of mass migration and if that means ignoring the government's own 'Covid' rules then so be it. They know it's all bullshit anyway. Any pushback on this is denounced as 'racist' by Wokers and Sabbatian fronts like the ultra-Zionist Anti-Defamation League headed by the appalling Jonathan Greenblatt which at the same time argues that Israel should not give citizenship and voting rights to more Palestinian Arabs or the 'Jewish population' (in truth the Sabbatian network) will lose control of the country. Biden's masters have declared that countries like El Salvador are so dangerous that their people must be allowed into the United States for humanitarian reasons when there are fewer murders in large parts of many Central American countries than in US cities like Baltimore. That is not to say Central America cannot be a dangerous place and Cult-controlled American governments have been making it so since way back, along with the dismantling of economies, in a long-term plan to drive people north into the United States. Parts of Central America are very dangerous, but in other areas the story is being greatly exaggerated to justify relaxing immigration criteria. Migrants are being offered free healthcare and education in the United States as another incentive to head for the border and there is no requirement to be financially independent before you can enter

to prevent the resources of America being drained. You can't blame migrants for seeking what they believe will be a better life, but they are being played by the Cult for dark and nefarious ends. The numbers since Biden took office are huge. In February, 2021, more than 100,000 people were known to have tried to enter the US illegally through the southern border (it was 34,000 in the same month in 2020) and in March it was 170,000 – a 418 percent increase on March, 2020. These numbers are only known people, not the ones who get in unseen. The true figure for migrants illegally crossing the border in a single month was estimated by one congressman at 250,000 and that number will only rise under Biden's current policy. Gangs of murdering drug-running thugs that control the Mexican side of the border demand money – thousands of dollars – to let migrants cross the Rio Grande into America. At the same time gun battles are breaking out on the border several times a week between rival Mexican drug gangs (which now operate globally) who are equipped with sophisticated military-grade weapons, grenades and armoured vehicles. While the Capitol Building was being 'protected' from a non-existent 'threat' by thousands of troops, and others were still deployed at the time in the Cult Neocon war in Afghanistan, the southern border of America was left to its fate. This is not incompetence, it is cold calculation. By March, 2021, there were 17,000 unaccompanied children held at border facilities and many of them are ensnared by people traffickers for paedophile rings and raped on their journey north to America. This is not conjecture – this is fact. Many of those designated children are in reality teenage boys or older. Meanwhile Wokers posture their self-purity for encouraging poor and tragic people to come to America and face this nightmare both on the journey and at the border with the disgusting figure of House Speaker Nancy Pelosi giving disingenuous speeches about caring for migrants. The woman's evil. Wokers condemned Trump for having children in cages at the border (so did Obama, Shhhh), but now they are sleeping on the floor without access to a shower with one border facility 729 percent over capacity. The Biden insanity even proposed flying migrants from the southern border to the northern border with Canada for 'processing'. The whole shambles is being overseen by ultra-Zionist Secretary of Homeland Security, the moronic liar



Alejandro Mayorkas, who banned news cameras at border facilities to stop Americans seeing what was happening. Mayorkas said there was not a ban on news crews; it was just that they were not allowed to film. Alongside him at Homeland Security is another ultra-Zionist Cass Sunstein appointed by Biden to oversee new immigration laws. Sunstein despises conspiracy researchers to the point where he suggests they should be banned or taxed for having such views. The man is not bonkers or anything. He's perfectly well-adjusted, but adjusted to what is the question. Criticise what is happening and you are a 'white supremacist' when earlier non-white immigrants also oppose the numbers which effect their lives and opportunities. Black people in poor areas are particularly damaged by uncontrolled immigration and the increased competition for work opportunities with those who will work for less. They are also losing voting power as Hispanics become more dominant in former black areas. It's a downward spiral for them while the billionaires behind the policy drone on about how much they care about black people and 'racism'. None of this is about compassion for migrants or black people – that's just wind and air. Migrants are instead being mercilessly exploited to transform America while the countries they leave are losing their future and the same is true in Europe. Mass immigration may now be the work of Woke Democrats, but it can be traced back to the 1986 Immigration Reform and Control Act (it wasn't) signed into law by Republican hero President Ronald Reagan which gave amnesty to millions living in the United States illegally and other incentives for people to head for the southern border. Here we have the one-party state at work again. Save me syndrome Almost every aspect of what I have been exposing as the Cult agenda was on display in even the first days of 'Biden' with silencing of Pushbackers at the forefront of everything. A Renegade Mind will view the Trump years and QAnon in a very different light to their supporters and advocates as the dots are connected. The QAnon/Trump Psyop has given the Cult all it was looking for. We may not know how much, or liĵle, that Trump realised he was being used, but that's a side issue. This pincer movement produced the desired outcome of dividing America and having Pushbackers isolated. To turn this around we have to look at new routes to empowerment which do not

include handing our power to other people and groups through what I will call the 'Save Me Syndrome' – 'I want someone else to do it so that I don't have to'. We have seen this at work throughout human history and the QAnon/Trump Psyop is only the latest incarnation alongside all the others. Religion is an obvious expression of this when people look to a 'god' or priest to save them or tell them how to be saved and then there are 'save me' politicians like Trump. Politics is a diversion and not a 'saviour'. It is a means to block positive change, not make it possible. Save Me Syndrome always comes with the same repeating theme of handing your power to whom or what you believe will save you while your real 'saviour' stares back from the mirror every morning. Renegade Minds are constantly vigilant in this regard and always asking the question 'What can I do?' rather than 'What can someone else do for me?' Gandhi was right when he said: 'You must be the change you want to see in the world.' We are indeed the people we have been waiting for. We are presented with a constant raġ of reasons to concede that power to others and forget where the real power is. Humanity has the numbers and the Cult does not. It has to use diversion and division to target the unstoppable power that comes from unity. Religions, governments, politicians, corporations, media, QAnon, are all different manifestations of this power- diversion and dilution. Refusing to give your power to governments and instead handing it to Trump and QAnon is not to take a new direction, but merely to recycle the old one with new names on the posters. I will explore this phenomenon as we proceed and how to break the cycles and recycles that got us here through the mists of repeating perception and so repeating history. For now we shall turn to the most potent example in the entire human story of the consequences that follow when you give your power away. I am talking, of course, of the 'Covid' hoax. 'Covid': Calculated catastrophe Facts are threatening to those invested in fraud e can easily unravel the real reason for the 'Covid pandemic' hoax by employing the Renegade Mind methodology that I have outlined this far. We'll start by comparing the long-planned Cult outcome with the 'Covid pandemic' outcome. Know the outcome and you'll see the journey. I have highlighted the plan for the Hunger Games Society which has been in my books for so many years with the very

few controlling the very many through ongoing dependency. To create this dependency it is essential to destroy independent livelihoods, businesses and employment to make the population reliant on the state (the Cult) for even the basics of life through a guaranteed pittance income. While independence of income remained these Cult ambitions would be thwarted. With this knowledge it was easy to see where the 'pandemic' hoax was going once talk of 'lockdowns' began and the closing of all but perceived 'essential' businesses to 'save' us from an alleged 'deadly virus'. Cult corporations like Amazon and Walmart were naturally considered 'essential' while mom and pop shops and stores had their doors closed by fascist decree. As a result with every new lockdown and new regulation more small and medium, even large businesses not owned by the Cult, went to the wall while Cult giants and their frontmen and women grew financially fatter by the second. Mom and pop were denied an income and the right to earn a living and the wealth of people like Jeff Bezos (Amazon), Mark Zuckerberg (Facebook) and Sergei Brin and Larry Page (Google/Alphabet) have reached record levels. The Cult was increasing its own power through further dramatic concentrations of wealth while the competition was being destroyed and brought into a state of dependency. Lockdowns have been instigated to secure that very end and were never anything to do with health. My brother Paul spent 45 years building up a bus repair business, but lockdowns meant buses were running at a fraction of normal levels for months on end. Similar stories can be told in their hundreds of millions worldwide. Efforts of a lifetime coldly destroyed by Cult multi-billionaires and their lackeys in government and law enforcement who continued to earn their living from the taxation of the people while denying the right of the same people to earn theirs. How different it would have been if those making and enforcing these decisions had to face the same financial hardships of those they affected, but they never do. Gates of Hell the psychopathic figure of Cult operative Bill Gates. His puppet Tedros at the World Health Organization declared 'Covid' a pandemic in March, 2020. The WHO had changed the definition of a 'pandemic' in 2009 just a month before declaring the 'swine flu pandemic' which would not have been so under the previous definition. The same applies to 'Covid'. The

definition had included... 'an infection by an infectious agent, occurring simultaneously in different countries, with a significant mortality rate relative to the proportion of the population infected'. The new definition removed the need for 'significant mortality'. The 'pandemic' has been fraudulent even down to the definition, but Gates demanded economy-destroying lockdowns, school closures, social distancing, mandatory masks, a 'vaccination' for every man, woman and child on the planet and severe consequences and restrictions for those that refused. Who gave him this power? The what his daddy tells him. He and his psychopathic missus even smiled when they said that much worse was to come (what they knew was planned to come). Gates responded in the maîer-of-fact way of all psychopaths to a question about the effect on the world Well, it won't go to zero but it will shrink. Global GDP is probably going to take the biggest hit ever [Gates was smiling as he said this] ... in my lifetime this will be the greatest economic hit. But you don't have a choice. People act as if you have a choice. People don't feel like going to the stadium when they might get infected ... People are deeply affected by seeing these stats, by knowing they could be part of the transmission chain, old people, their parents and grandparents, could be affected by this, and so you don't get to say ignore what is going There will be the ability to open up, particularly in rich countries, if things are done well over the next few months, but for the world at large normalcy only returns when we have largely vaccinated the entire population. The man has no compassion or empathy. How could he when he's a psychopath like all Cult players? My own view is that even beyond that he is very seriously mentally ill. Look in his eyes and you can see this along with his crazy flailing arms. You don't do what he has done to the world population since the start of 2020 unless you are mentally ill and at the most extreme end of psychopathic. You especially don't do it when to you know, as we shall see, that cases and deaths from 'Covid' are fakery and a product of monumental figure massaging. 'These stats' that Gates referred to are based on a 'test' that's not testing for the 'virus' as he has known all along. He made his fortune with big Cult support as an infamously ruthless soŒware salesman and now buys global control of 'health' (death) policy without the population he affects having

any say. It's a breathtaking outrage. Gates talked about people being deeply affected by fear of 'Covid' when that was because of him and his global network lying to them minute-by-minute supported by a lying media that he seriously influences and funds to the tune of hundreds of millions. He's handed big sums to media operations including the BBC, NBC, Al Jazeera, Univision, PBS NewsHour, ProPublica, National Journal, The Guardian, The Financial Times, The Atlantic, Texas Tribune, USA Today publisher Gannett, Washington Monthly, Le Monde, Center for Investigative Reporting, Pulitzer Center on Crisis Reporting, National Press Foundation, International Center for Journalists, Solutions Journalism Network, the Poynter Institute for Media Studies, and many more. Gates is everywhere in the 'Covid' hoax and the man must go to prison – or a mental facility – for the rest of his life and his money distributed to those he has taken such enormous psychopathic pleasure in crushing. The Hunger Games global structure demands a police-military state – a fusion of the two into one force – which viciously imposes the will of the Cult on the population and protects the Cult from public rebellion. In that regard, too, the 'Covid' hoax just keeps on giving. Often unlawful, ridiculous and contradictory 'Covid' rules and regulations have been policed across the world by moronic automatons and psychopaths made faceless by face-nappy masks and acting like the Nazi SS and fascist blackshirts and brownshirts of Hitler and Mussolini. The smallest departure from the rules decreed by the psychos in government and their clueless gofers were jumped upon by the face-nappy fascists. Brutality against public protestors soon became commonplace even on girls, women and old people as the brave men with the batons – the Face-Nappies as I call them – broke up peaceful protests and handed out fines like confetti to people who couldn't earn a living let alone pay hundreds of pounds for what was once an accepted human right. Robot Face-Nappies of Nottingham police in the English East Midlands fined one group £11,000 for attending a child's birthday party. For decades I charted the transformation of law enforcement as genuine, decent officers were replaced with psychopaths and the brain dead who would happily and brutally do whatever their masters told them. Now they were let loose on the public and I would emphasise the point that none

of this just happened. The step-by-step change in the dynamic between police and public was orchestrated from the shadows by those who knew where this was all going and the same with the perceptual reframing of those in all levels of authority and official administration through 'training courses' by organisations such as Common Purpose which was created in the late 1980s and given a massive boost in Blair era Britain until it became a global phenomenon. Supposed public 'servants' began to view the population as the enemy and the same was true of the police. This was the start of the explosion of behaviour manipulation organisations and networks preparing for the all-war on the human psyche unleashed with the dawn of 2020. I will go into more detail about this later in the book because it is a core part of what is Police desecrated beauty spots to deter people gathering and arrested women for walking in the countryside alone 'too far' from their homes. We had arrogant, clueless sergeants in the Isle of Wight police where I live posting on Facebook what they insisted the population must do or else. A schoolmaster sergeant called Radford looked young enough for me to ask if his mother knew he was out, but he was posting what he expected people to do while a Sergeant Wilkinson boasted about fining lads for meeting in a McDonald's car park where they went to get a lockdown takeaway. Wilkinson added that he had even cancelled their order. What a pair of prats these people are and yet they have increasingly become the norm among Jackboot Johnson's Yellowshirts once known as the British police. This was the theme all over the world with police savagery common during lockdown protests in the United States, the Netherlands, and the fascist state of Victoria in Australia under its tyrannical and again moronic premier Daniel Andrews. Amazing how tyrannical and moronic tend to work as a team and the same combination could be seen across America as arrogant, narcissistic Woke governors and mayors such as Gavin Newsom (California), Andrew Cuomo (New York), Gretchen Whitmer (Michigan), Lori Lightfoot (Chicago) and Eric Garcetti (Los Angeles) did their Nazi and Stalin impressions with the full support of the compliant brutality of their enforcers in uniform as they arrested small business owners defying fascist shutdown orders and took them to jail in ankle shackles and handcuffs. This happened to bistro owner Marlena

Pavlos-Hackney in Gretchen Whitmer's fascist state of Michigan when police arrived to enforce an order by a state-owned judge for 'putting the community at risk' at a time when other states like Texas were dropping restrictions and migrants were pouring across the southern border without any 'Covid' questions at all. I'm sure there are many officers appalled by what they are ordered to do, but not nearly enough of them. If they were truly appalled they would not do it. As the months passed every opportunity was taken to have the military involved to make their presence on the streets ever more familiar and 'normal' for the longer-term goal of police-military. Another crucial element to the Hunger Games enforcement network has been encouraging the public to report neighbours and others for 'breaking the lockdown rules'. The group faced with £11,000 in fines at the child's birthday party would have been doxxed-in by a neighbour with a brain the size of a pea. The technique was most famously employed by the Stasi secret police in communist East Germany who had public informants placed throughout the population. A police chief in the UK says his force doesn't need to carry out 'Covid' patrols when they are flooded with so many calls from the public reporting other people for visiting the beach. Dorset police chief James Vaughan said people were so enthusiastic about snitching on their fellow humans they were now operating as an auxiliary arm of the police: 'We are still getting around 400 reports a week from the public, so we will respond to are very quick to pick the phone up and tell us.' Vaughan didn't say that this is a pillar of all tyrannies of whatever complexion and the means to hugely extend the reach of enforcement while spreading that might get them reported. Those narcissistic Isle of Wight sergeants Radford and Wilkinson never fail to add a link to their Facebook posts where the public can inform on their fellow slaves. Neither would be self-aware enough to realise they were imitating the Stasi which they might well never have heard of. Government psychologists that I will expose later laid out a policy to turn communities against each other in the same way. A coincidence? Yep, and I can knit fog I knew from the start of the alleged pandemic that this was a Cult operation. It presented limitless potential to rapidly advance the Cult agenda and exploit manipulated fear to demand that every man, woman and child on the planet was 'vaccinated' in a process

never used on humans before which infuses self-replicating synthetic material into human cells. Remember the plan to transform the human body from a biological to a synthetic biological state. I'll deal with the 'vaccine' (that's not actually a vaccine) when I focus on the genetic agenda. Enough to say here that mass global 'vaccination' justified by this 'new virus' set alarms ringing after 30 years of tracking these people and their methods. The 'Covid' hoax officially beginning in China was also a big red flag for reasons I will be explaining. The agenda potential was so enormous that I could dismiss any idea that the 'virus' appeared naturally. Major happenings with major agenda implications never occur without Cult involvement in making them happen. My questions were twofold in early 2020 as the media began its campaign to induce global fear and hysteria: Was this alleged infectious agent released on purpose by the Cult or did it even exist at all? I then did what I always do in these situations. I sat, observed and waited to see where the evidence and information would take me. By March and early April synchronicity was strongly – and ever more so since then – pointing me in the direction of there is no 'virus'. I went public on that with derision even from swathes of the alternative media that voiced a scenario that the Chinese government released the 'virus' in league with Deep State elements in the United States from a top-level bio-lab in Wuhan where the 'virus' is said to have first appeared. I looked at that possibility, but I didn't buy it for several reasons. Deaths from the 'virus' did not in any way match what they would have been with a 'deadly bioweapon' and it is much more effective if you sell the illusion of an infectious agent rather than having a real one unless you can control through injection who has it and who doesn't. Otherwise you lose control of events. A made-up 'virus' gives you a blank sheet of paper on which you can make it do whatever you like and have any symptoms or mutant 'variants' you choose to add while a real infectious agent would limit you to what it actually does. A phantom disease allows you to have endless ludicrous 'studies' on the 'Covid' dollar to widen the perceived impact by inventing ever more 'at risk' groups including one study which said those who walk slowly may be almost four times more likely to die from the 'virus'. People are in psychiatric wards for less. A real 'deadly bioweapon' can take out people in the hierarchy



that are not part of the Cult, but essential to its operation. Obviously they don't want that. Releasing a real disease means you immediately lose control of it. Releasing an illusory one means you don't. Again it's vital that people are extra careful when dealing with what they want to hear. A bioweapon unleashed from a Chinese laboratory in collusion with the American Deep State may fit a conspiracy narrative, but is it true? Would it not be far more effective to use the excuse of a 'virus' to justify the real bioweapon – the 'vaccine'? That way your disease agent does not have to be transmitted and arrives directly through a syringe. I saw a French virologist Luc Montagnier quoted in the alternative media as saying he had discovered that the alleged 'new' severe acute respiratory syndrome coronavirus , or SARS-CoV-2, was made artificially and included elements of the human immunodeficiency 'virus' (HIV) and a parasite that causes malaria. SARS-CoV-2 is alleged to trigger an alleged illness called Covid-19. I remembered Montagnier's name from my research years before into claims that an HIV 'retrovirus' causes AIDs – claims that were demolished by Berkeley virologist Peter Duesberg who showed that no one had ever proved that HIV causes acquired immunodeficiency syndrome or AIDS. Claims that become accepted as fact, publicly and medically, with no proof whatsoever are an ever-recurring story that profoundly applies to 'Covid'. Nevertheless, despite the lack of proof, Montagnier's team at the Pasteur Institute in Paris had a long dispute with American researcher Robert Gallo over which of them discovered and isolated the HIV 'virus' and with no evidence found it to cause AIDS. You will see later that there is also no evidence that any 'virus' causes any disease or that there is even such a thing as a 'virus' in the way it is said to exist. The claim to have 'isolated' the HIV 'virus' will be presented in its real context as we come to the shocking story – and it is a story – of SARS-CoV-2 and so will Montagnier's assertion that he identified the full SARS-CoV-2 genome. Hoax in the making We can pick up the 'Covid' story in 2010 and the publication by the Rockefeller Foundation of a document called 'Scenarios for the Future of Technology and International Development'. The inner circle of the Rockefeller family has been serving the Cult since John D. Rockefeller (1839-1937) made his fortune with Standard Oil. It is less well known

that the same Rockefeller – the Bill Gates of his day – was responsible for establishing what is now referred to as 'Big Pharma', the global network of pharmaceutical companies that make outrageous profits dispensing scalpel and drug 'medicine' and are obsessed with pumping vaccines in ever-increasing number into as many human arms and backsides as possible. John D. Rockefeller was the driving force behind the creation of the 'education' system in the United States and elsewhere specifically designed to program the perceptions of generations thereafter. The Rockefeller family donated exceptionally valuable land in New York for the United Nations building and were central in establishing the World Health Organization in 1948 as an agency of the UN which was created from the start as a Trojan horse and stalking horse for world government. Now enter Bill Gates. His family and the Rockefellers have long been extremely close and I have seen genealogy which claims that if you go back far enough the two families fuse into the same bloodline. Gates has said that the Bill and Melinda Gates Foundation was inspired by the Rockefeller Foundation and why not when both are serving the same Cult? Major tax-exempt foundations are overwhelmingly criminal enterprises in which Cult assets fund the Cult agenda in the guise of 'philanthropy' while avoiding tax in the process. Cult operatives can become mega-rich in their role of front men and women for the psychopaths at the inner core and they, too, have to be psychopaths to knowingly serve such evil. Part of the deal is that a big percentage of the wealth gleaned from representing the Cult has to be spent advancing the ambitions of the Cult and hence you have the Rockefeller Foundation, Bill and Melinda Gates Foundation (and so many more) and people like George Soros with his global Open Society Foundations spending their billions in pursuit of global Cult control. Gates is a global public face of the Cult with his interventions in world affairs including Big Tech influence; a central role in the 'Covid' and 'vaccine' scam; promotion of the climate change shakedown; manipulation of education; geoengineering of the skies; and his food-control agenda as the biggest owner of farmland in America, his GMO promotion and through other means. As one writer said: 'Gates monopolizes or wields disproportionate influence over the tech industry, global health and vaccines, agriculture and food policy

(including biopiracy and fake food), weather modification and other climate technologies, surveillance, education and media.' The almost limitless wealth secured through Microsoft and other not-allowed-to-fail ventures (including vaccines) has been ploughed into a long, long list of Cult projects designed to enslave the entire human race. Gates and the Rockefellers have been working as one unit with the Rockefeller-established World Health Organization leading global 'Covid' policy controlled by Gates through his mouth-piece Tedros. Gates became the WHO's biggest funder when Trump announced that the American government would cease its donations, but Biden immediately said he would restore the money when he took office in January, 2021. The Gates Foundation (the Cult) owns through limitless funding the world health system and the major players across the globe in the 'Covid' hoax. Okay, with that background we return to that Rockefeller Foundation document of 2010 headed 'Scenarios for the Future of Technology and International Development' and its 'imaginary' epidemic of a virulent and deadly influenza strain which infected 20 percent of the global population and killed eight million in seven months. The Rockefeller scenario was that the epidemic destroyed economies, closed shops, offices and other businesses and led to governments imposing fierce rules and restrictions that included mandatory wearing of face masks and body-temperature checks to enter communal spaces like railway stations and supermarkets. The document predicted that even after the height of the Rockefeller- envisaged epidemic the authoritarian rule would continue to deal with further pandemics, transnational terrorism, environmental crises and rising poverty. Now you may think that the Rockefellers are our modern-day seers or alternatively, and rather more likely, that they well knew what was planned a few years further on. Fascism had to be imposed, you see, to 'protect citizens from risk and exposure'. The Rockefeller scenario document said: During the pandemic, national leaders around the world flexed their authority and imposed airtight rules and restrictions, from the mandatory wearing of face masks to body-temperature checks at the entries to communal spaces like train stations and supermarkets. Even after the pandemic faded, this more authoritarian control and oversight of citizens and their activities stuck and even

intensified. In order to protect themselves from the spread of increasingly global problems – from pandemics and transnational terrorism to environmental crises and rising poverty – leaders around the world took a firmer grip on power. At first, the notion of a more controlled world gained wide acceptance and approval. Citizens willingly gave up some of their sovereignty – and their privacy – to more paternalistic states in exchange for greater safety and stability. Citizens were more tolerant, and even eager, for top- down direction and oversight, and national leaders had more latitude to impose order in the ways they saw fit. In developed countries, this heightened oversight took many forms: biometric IDs for all citizens, for example, and tighter regulation of key industries whose stability was deemed vital to national interests. In many developed countries, enforced cooperation with a suite of new regulations and agreements slowly but steadily restored both order and, importantly, There we have the prophetic Rockefellers in 2010 and three years later came their paper for the Global Health Summit in Beijing, China, when government representatives, the private sector, international organisations and groups met to discuss the next 100 years of ‘global health’. The Rockefeller Foundation-funded paper was called ‘Dreaming the Future of Health for the Next 100 Years and more prophecy ensued as it described a dystopian future: ‘The abundance of data, digitally tracking and linking people may mean the ‘death of privacy’ and may replace physical interaction with transient, virtual connection, generating isolation and raising questions of how values are shaped in virtual networks.’ Next in the ‘Covid’ hoax preparation sequence came a ‘table top’ simulation in 2018 for another ‘imaginary’ pandemic of a disease called Clade X which was said to kill 900 million people. The exercise was organised by the Gates-funded Johns Hopkins University’s Center for Health Security in the United States and this is the very same university that has been compiling the disgustingly and systematically erroneous global figures for ‘Covid’ cases and deaths. Similar Johns Hopkins health crisis scenarios have included the Dark Winter exercise in 2001 and Atlantic Storm in 2005. For sheer predictive genius look no further prophecy-watchers than the Bill Gates-funded Event 201 held only six weeks before the ‘coronavirus pandemic’ is supposed to have broken out in China and

Event 201 was based on a scenario of a global 'coronavirus pandemic'. Melinda Gates, the great man's missus, told the BBC that he had 'prepared for years' for a coronavirus pandemic which told us what we already knew. Nostradamugates had predicted in a TED talk in 2015 that a pandemic was coming that would kill a lot of people and demolish the world economy. My god, the man is a machine – possibly even literally. Now here he was only weeks before the real thing funding just such a simulated scenario and involving his friends and associates at Johns Hopkins, the World Economic Forum Cult-front of Klaus Schwab, the United Nations, Johnson & Johnson, major banks, and officials from China and the Centers for Disease Control in the United States. What synchronicity – Johns Hopkins would go on to compile the fraudulent 'Covid' figures, the World Economic Forum and Schwab would push the 'Great Reset' in response to 'Covid', the Centers for Disease Control would be at the forefront of 'Covid' policy in the United States, Johnson & Johnson would produce a 'Covid vaccine', and everything would officially start just weeks later in China. Spooky, eh? They were even accurate in creating a simulation of a 'virus' pandemic because the 'real thing' would also be a simulation. Event 201 was not an exercise preparing for something that might happen; it was a rehearsal for what those in control knew was going to happen and very shortly. Hours of this simulation were posted on the Internet and the various themes and responses mirrored what would soon be imposed to transform human society. News stories were inserted and what they said would be commonplace a few weeks later with still more prophecy perfection. Much discussion focused on the need to deal with misinformation and the 'anti-vax movement' which is exactly what happened when the 'virus' arrived – was said to have arrived – in the West. Cult-owned social media banned criticism and exposure of the official 'virus' narrative and when I said there was no 'virus' in early April, 2020, I was banned by one platform after another including YouTube, Facebook and later Twitter. The mainstream broadcast media in Britain was in effect banned from interviewing me by the Tony-Blair-created government broadcasting censor Ofcom headed by career government bureaucrat Melanie Dawes who was appointed just as the 'virus' hoax was about to play out in January, 2020. At the same time

the Ickonic media platform was using Vimeo, another ultra-Zionist-owned operation, while our own player was being created and they deleted in an instant hundreds of videos, documentaries, series and shows to confirm their unbelievable vindictiveness. We had copies, of course, and they had to be restored one by one when our player was ready. These people have no class. Sabbatian Facebook promised free advertisements for the Gates- controlled World Health Organization narrative while deleting 'false claims and conspiracy theories' to stop 'misinformation' about the alleged coronavirus. All these responses could be seen just a short while earlier in the scenarios of Event 201. Extreme censorship was absolutely crucial for the Cult because the official story was so ridiculous and unsupportable by the evidence that it could never survive open debate and the free-flow of information and opinion. If you can't win a debate then don't have one is the Cult's approach throughout history. Facebook's little boy front man – front boy – Mark Zuckerberg equated 'credible and accurate information' with official sources and exposing their lies with 'misinformation'. Silencing those that can see The censorship dynamic of Event 201 is now the norm with an army of narrative-supporting 'fact-checker' organisations whose entire reason for being is to tell the public that official narratives are true and those exposing them are lying. One of the most appalling of these 'fact-checkers' is called NewsGuard founded by ultra-Zionist Americans Gordon Crovitz and Steven Brill. Crovitz is a former publisher of The Wall Street Journal, former Executive Vice President of Dow Jones, a member of the Council on Foreign Relations (CFR), and on the board of the American Association of Rhodes Scholars. The CFR and Rhodes Scholarships, named after Rothschild agent Cecil Rhodes who plundered the gold and diamonds of South Africa for his masters and the Cult, have featured widely in my books. NewsGuard don't seem to like me for some reason – I really can't think why – and they have done all they can to have me censored and discredited which is, to quote an old British politician, like being savaged by a dead sheep. They are, however, like all in the censorship network, very well connected and funded by organisations themselves funded by, or connected to, Bill Gates. As you would expect with anything associated with Gates NewsGuard has an offshoot called HealthGuard

which 'fights online health care hoaxes'. How very kind. Somehow the NewsGuard European Managing Director Anna-Sophie Harling, a remarkably young- looking woman with no broadcasting experience and little hands-on work in journalism, has somehow secured a position on the 'Content Board' of UK government broadcast censor Ofcom. An executive of an organisation seeking to discredit dissidents of the official narratives is making decisions for the government broadcast 'regulator' about content?? Another appalling 'fact-checker' is Full Fact funded by George Soros and global censors Google and It's amazing how many activists in the 'fact-checking', 'anti-hate', arena turn up in government-related positions – people like UK Labour Party activist Imran Ahmed who heads the Center for Countering Digital Hate founded by people like Morgan McSweeney, now chief of staff to the Labour Party's hapless and useless 'leader' Keir Starmer. Digital Hate – which is what it really is – uses the American spelling of Center to betray its connection to a transatlantic network of similar organisations which in 2020 shapeshifted from attacking people for 'hate' to attacking them for questioning the 'Covid' hoax and the dangers of the 'Covid vaccine'. It's just a coincidence, you understand. This is one of Imran Ahmed's hysterical statements: 'I would go beyond calling anti-vaxxers conspiracy theorists to say they are an extremist group that pose a national security risk.' No one could ever accuse this prat of understatement and he's including in that those parents who are now against vaccines after their children were damaged for life or killed by them. He's such a nice man. Ahmed does the rounds of the Woke media getting softball questions from spineless 'journalists' who never ask what right he has to campaign to destroy the freedom of speech of others while he demands it for himself. There also seems to be an overrepresentation in Ofcom of people connected to the narrative-worshipping BBC. This incredible global network of narrative-support was super-vital when the 'Covid' hoax was played in the light of the mega-whopper lies that have to be defended from the spotlight cast by the most basic intelligence. Setting the scene The Cult plays the long game and proceeds step-by-step ensuring that everything is in place before major cards are played and they don't come any bigger than the 'Covid' hoax. The psychopaths can't handle events where the

outcome isn't certain and as little as possible – preferably nothing – is left to chance. Politicians, government and medical officials who would follow direction were brought to illusory power in advance by the Cult web whether on the national stage or others like state governors and mayors of America. For decades the dynamic between officialdom, law enforcement and the public was changed from one of service to one of control and dictatorship. Behaviour manipulation networks established within government were waiting to impose the coming 'Covid' rules and regulations specifically designed to subdue and rewire the psyche of the people in the guise of protecting health. These included in the UK the Behavioural Insights Team part-owned by the British government Cabinet Office; the Scientific Pandemic Insights Group on Behaviours (SPI-B); and a whole web of intelligence and military groups seeking to direct the conversation on social media and control the narrative. Among them are the cyberwarfare (on the people) 77th Brigade of the British military which is also coordinated through the Cabinet Office as civilian and military leadership continues to combine in what they call the Fusion Doctrine. The 77th Brigade is a British equivalent of the infamous Israeli (Sabbatian) military cyberwarfare and Internet manipulation operation Unit 8200 which I expose at length in *The Trigger*. Also carefully in place were the medical and science advisers to government – many on the payroll past or present of Bill Gates – and a whole alternative structure of unelected government stood by to take control when elected parliaments were effectively closed down once the 'Covid' card was slammed on the table. The structure I have described here and so much more was installed in every major country through the Cult networks. The top-down control hierarchy looks like this: The Cult – Cult-owned Gates – the World Health Organization and Tedros – Gates-funded or controlled chief medical officers and science 'advisers' (dictators) in each country – political 'leaders' – law enforcement – The People. Through this simple global communication and enforcement structure the policy of the Cult could be imposed on virtually the entire human population so long as they acquiesced to the fascism. With everything in place it was time for the button to be pressed in late These were the prime goals the Cult had to secure for its will to 1) Locking down economies, closing all but



designated 'essential' businesses (Cult-owned corporations were 'essential'), and putting the population under house arrest was an imperative to destroy independent income and employment and ensure dependency on the Cult-controlled state in the Hunger Games Society. Lockdowns had to be established as the global blueprint from the start to respond to the 'virus' and followed by pretty much the 2) The global population had to be terrified into believing in a deadly 'virus' that didn't actually exist so they would unquestioningly obey authority in the belief that authority must know how best to protect them and their families. Software salesman Gates would suddenly morph into the world's health expert and be promoted as such by the Cult-owned 3) A method of testing that wasn't testing for the 'virus', but was only claimed to be, had to be in place to provide the illusion of 'cases' and subsequent 'deaths' that had a very different cause to the 'Covid-19' that would be scribbled on the death certificate. 4) Because there was no 'virus' and the great majority testing positive with a test not testing for the 'virus' would have no symptoms of anything the lie had to be sold that people without symptoms (without the 'virus') could still pass it on to others. This was crucial to justify for the first time quarantining – house arresting – healthy people. Without this the economy-destroying lockdown of everybody could not have been credibly sold. 5) The 'saviour' had to be seen as a vaccine which beyond evil drug companies were working like angels of mercy to develop as quickly as possible, with all corners cut, to save the day. The public must absolutely not know that the 'vaccine' had nothing to do with a 'virus' or that the contents were ready and waiting with a very different motive long before the 'Covid' card was even lifted from the pack. I said in March, 2020, that the 'vaccine' would have been created way ahead of the 'Covid' hoax which justified its use and the following December an article in the New York Intelligencer magazine said the Moderna 'vaccine' had been 'designed' by January, 2020. This was 'before China had even acknowledged that the disease could be transmitted from human to human, more than a week before the first confirmed coronavirus case in the United States'. The article said that by the time the first American death was announced a month later 'the vaccine had already been manufactured and shipped to the National Institutes of Health for

the beginning of its Phase I clinical trial'. The 'vaccine' was actually 'designed' long before that although even with this timescale you would expect the article to ask how on earth it could have been done that quickly. Instead it asked why the 'vaccine' had not been rolled out then and not months later. Journalism in the mainstream is truly dead. I am going to detail in the next chapter why the 'virus' has never existed and how a hoax on that scale was possible, but first the foundation on which the Big Lie of 'Covid' was built. The test that doesn't test Fraudulent 'testing' is the boîom line of the whole 'Covid' hoax and was the means by which a 'virus' that did not exist appeared to exist. They could only achieve this magic trick by using a test not testing for the 'virus'. To use a test that was testing for the 'virus' would mean that every test would come back negative given there was no 'virus'. They chose to exploit something called the RT-PCR test invented by American biochemist Kary Mullis in the 1980s who said publicly that his PCR test ... cannot detect infectious disease. Yes, the 'test' used worldwide to detect infectious 'Covid' to produce all the illusory 'cases' and 'deaths' compiled by Johns Hopkins and others cannot detect infectious disease. This fact came from the mouth of the man who invented PCR and was awarded the Nobel Prize in for the Cult, Mullis died in August, 2019, at the age of 74 just before his test would be fraudulently used to unleash fascism on the world. He was said to have died from pneumonia which was an irony in itself. A few months later he would have had 'Covid-19' on his death certificate. I say the timing of his death was convenient because had he lived Mullis, a brilliant, honest and decent man, would have been vociferously speaking out against the use of his test to detect 'Covid' when it was never designed, or able, to do that. I know that to be true given that Mullis made the same point when his test was used to 'detect' – not detect – HIV. He had been seriously critical of the Gallo/Montagnier claim to have isolated the HIV 'virus' and shown it to cause AIDS for which Mullis said there was no evidence. AIDS is actually not a disease but a series of diseases from which people die all the time. When they die from those same diseases aĜer a positive 'test' for HIV then AIDS goes on their death certificate. I think I've heard that before somewhere. Countries instigated a policy with 'Covid' that anyone who tested positive with a test not

testing for the 'virus' and died of any other cause within 28 days and even longer 'Covid-19' had to go on the death certificate. Cases have come from the test that can't test for infectious disease and the deaths are those who have died of anything after testing positive with a test not testing for the 'virus'. I'll have much more later about the death certificate scandal. Mullis was deeply dismissive of the now US 'Covid' star Anthony Fauci who he said was a liar who didn't know anything about anything – 'and I would say that to his face – nothing.' He said of Fauci: 'The man thinks he can take a blood sample, put it in an electron microscope and if it's got a virus in there you'll know it – he doesn't understand electron microscopy and he doesn't understand medicine and shouldn't be in a position like he's in.' That position, terrifyingly, has made him the decider of 'Covid' fascism policy on behalf of the Cult in his role as director since 1984 of the National Institute of Allergy and Infectious Diseases (NIAID) while his record of being wrong is laughable; but being wrong, so long as it's the right kind of wrong, is why the Cult loves him. He'll say anything the Cult tells him to say. Fauci was made Chief Medical Adviser to the President immediately Biden took office. Biden was installed in the White House by Cult manipulation and one of his first decisions was to elevate Fauci to a position of even more control. This is a coincidence? Yes, and I identify as a flamenco dancer called Lola. How does such an incompetent criminal like Fauci remain in that pivotal position in American health since the 1980s? When you serve the Cult it looks after you until you are surplus to requirements. Kary Mullis said prophetically of Fauci and his like: 'Those guys have an agenda and it's not an agenda we would like them to have ... they make their own rules, they change them when they want to, and Tony Fauci does not mind going on television in front of the people who pay his salary and lie directly into the camera.' Fauci has done that almost daily since the 'Covid' hoax began. Lying is in Fauci's DNA. To make the situation crystal clear about the PCR test this is a direct quote from its inventor Kary Mullis: It [the PCR test] doesn't tell you that you're sick and doesn't tell you that the thing you ended up with was really going to hurt you ...' Ask yourself why governments and medical systems the world over have been using this very test to decide who is 'infected' with the SARS-CoV-2 'virus' and the alleged disease it

allegedly causes, 'Covid-19'. The answer to that question will tell you what has been going on. By the way, here's a little show-stopper – the 'new' SARS- CoV-2 'virus' was 'identified' as such right from the start using ... the PCR test not testing for the 'virus'. If you are new to this and find that shocking then stick around. I have hardly started yet. Even worse, other 'tests', like the 'Lateral Flow Device' (LFD), are considered so useless that they have to be confirmed by the PCR test! Leaked emails written by Ben Dyson, adviser to UK 'Health' Secretary Matt Hancock, said they were 'dangerously unreliable'. Dyson, executive director of strategy at the Department of Health, wrote: 'As of today, someone who gets a positive LFD result in (say) London has at best a 25 per cent chance of it being a true positive, but if it is a self- reported test potentially as low as 10 per cent (on an optimistic assumption about specificity) or as low as 2 per cent (on a more pessimistic assumption).' These are the 'tests' that schoolchildren and the public are being urged to have twice a week or more and have to isolate if they get a positive. Each fake positive goes in the statistics as a 'case' no matter how ludicrously inaccurate and the 'cases' drive lockdown, masks and the pressure to 'vaccinate'. The government said in response to the email leak that the 'tests' were accurate which confirmed yet again what shocking bloody liars they are. The real false positive rate is 100 percent as we'll see. In another 'you couldn't make it up' the UK government agreed to pay £2.8 billion to California's Innova Medical Group to supply the irrelevant lateral flow tests. The company's primary test-making centre is in China. Innova Medical Group, established in March, 2020, is owned by Pasaca Capital Inc, chaired by Chinese-American millionaire Charles Huang who was born in Wuhan. How it works – and how it doesn't The RT-PCR test, known by its full title of Polymerase chain reaction, is used across the world to make millions, even billions, of copies of a DNA/RNA genetic information sample. The process is called 'amplification' and means that a tiny sample of genetic material is amplified to bring out the detailed content. I stress that it is not testing for an infectious disease. It is simply amplifying a sample of genetic material. In the words of Kary Mullis: 'PCR is ... just a process that's used to make a whole lot of something out of something.' To emphasise the point companies that make the PCR tests circulated

around the world to 'test' for 'Covid' warn on the box that it can't be used to detect 'Covid' or infectious disease and is for research purposes only. It's okay, rest for a minute and you'll be fine. This is the test that produces the 'cases' and 'deaths' that have been used to destroy human society. All those global and national medical and scientific 'experts' demanding this destruction to 'save us' KNOW that the test is not testing for the 'virus' and the cases and deaths they claim to be real are an almost unimaginable fraud. Every one of them and so many others including politicians and psychopaths like Gates and Tedros must be brought before Nuremburg-type trials and jailed for the rest of their lives. The more the genetic sample is amplified by PCR the more elements of that material become sensitive to the test and by that I don't mean sensitive for a 'virus' but for elements of the genetic material which is naturally in the body or relates to remnants of old conditions of various kinds lying dormant and causing no disease. Once the amplification of the PCR reaches a certain level everyone will test positive. So much of the material has been made sensitive to the test that everyone will have some part of it in their body. Even lying criminals like Fauci have said that once PCR amplifications pass 35 cycles everything will be a false positive that cannot be trusted for the reasons I have described. I say, like many proper doctors and scientists, that 100 percent of the 'positives' are false, but let's just go with Fauci for a moment. He says that any amplification over 35 cycles will produce false positives and yet the US Centers for Disease Control (CDC) and Food and Drug Administration (FDA) have recommended up to 40 cycles and the National Health Service (NHS) in Britain admitted in an internal document for staff that it was using 45 cycles of and at least one 'testing' laboratory has been using 50 cycles. Have you ever heard a doctor, medical 'expert' or the media ask what level of amplification has been used to claim a 'positive'. The 'test' comes back 'positive' and so you have the 'virus', end of story. Now we can see how the government in Tanzania could send off samples from a goat and a pawpaw fruit under human names and both came back positive for 'Covid-19'. Tanzania president John Magufuli mocked the 'Covid' hysteria, the PCR test and masks and refused to import the DNA-manipulating 'vaccine'. The Cult hated him and an article sponsored by the Bill

Gates Foundation appeared in the London Guardian in February, 2021, headed 'It's time for Africa to rein in Tanzania's anti-vaxxer president'. Well, 'reined in' he shortly was. Magufuli appeared in good health, but then, in March, 2021, he was dead at 61 from 'heart failure'. He was replaced by Samia Hassan Suhulu who is connected to Klaus Schwab's World Economic Forum and she immediately reversed Magufuli's 'Covid' policy. A sample of cola tested positive for 'Covid' with the PCR test in Germany while American actress and singer-songwriter Erykah Badu tested positive in one nostril and negative in the other. Footballer Ronaldo called the PCR test 'bullshit' after testing positive three times and being forced to quarantine and miss matches when there was nothing wrong with him. The mantra from Tedros at the World Health Organization and national governments (same thing) has been test, test, test. They know that the more tests they can generate the more fake 'cases' they have which go on to become 'deaths' in ways I am coming to. The UK government has its Operation Moonshot planned to test multiple millions every day in workplaces and schools with free tests for everyone to use twice a week at home in line with the Cult plan from the start to make testing part of life. A government advertisement for an 'Interim Head of Asymptomatic Testing Communication' said the job included responsibility for delivering a 'communications strategy' (propaganda) 'to support the expansion of asymptomatic testing that 'normalises testing as part of everyday life'. More tests means more fake 'cases', 'deaths' and fascism. I have heard of, and from, many people who booked a test, couldn't turn up, and yet got a positive result through the post for a test they'd never even had. The whole thing is crazy, but for the Cult there's method in the madness. Controlling and manipulating the level of amplification of the test means the authorities can control whenever they want the number of apparent 'cases' and 'deaths'. If they want to justify more fascist lockdown and destruction of livelihoods they keep the amplification high. If they want to give the illusion that lockdowns and the 'vaccine' are working then they lower the amplification and 'cases' and 'deaths' will appear to fall. In January, 2021, the Cult-owned World Health Organization suddenly warned laboratories about over-amplification of the test and to lower the threshold. Suddenly headlines began appearing

such as: 'Why ARE "Covid" cases plummeting?' This was just when the vaccine rollout was underway and I had predicted months before they would make cases appear to fall through amplification tampering when the 'vaccine' came. These people are so predictable. The question must be asked of what is on the test swabs being poked far up the nose of the population to the base of the brain? A nasal swab punctured one woman's brain and caused it to leak fluid. Most of these procedures are being done by people with little training or medical knowledge. Dr Lorraine Day, former orthopaedic trauma surgeon and Chief of Orthopaedic Surgery at San Francisco General Hospital, says the tests are really a 'vaccine'. Cows have long been vaccinated this way. She points out that masks have to cover the nose and the mouth where it is claimed the 'virus' exists in saliva. Why then don't they take saliva from the mouth as they do with a DNA test instead of pushing a long swab up the nose towards the brain? The ethmoid bone separates the nasal cavity from the brain and within that bone is the cribriform plate. Dr Day says that when the swab is pushed up against this plate and twisted the procedure is 'depositing things back there'. She claims that among these 'things' are nanoparticles that can enter the brain. Researchers have noted that a team at the Gates-funded Johns Hopkins have designed tiny, star-shaped micro-devices that can latch onto intestinal mucosa and release drugs into the body. Mucosa is the thin skin that covers the inside surface of parts of the body such as the nose and mouth and produces mucus to protect them. The Johns Hopkins micro-devices are called 'theragrippers' and were 'inspired' by a parasitic worm that digs its sharp teeth into a host's intestines. Nasal swabs are also coated in the sterilisation agent ethylene oxide. The US National Cancer Institute posts this explanation on its website: At room temperature, ethylene oxide is a flammable colorless gas with a sweet odor. It is used primarily to produce other chemicals, including antifreeze. In smaller amounts, ethylene oxide is used as a pesticide and a sterilizing agent. The ability of ethylene oxide to damage DNA makes it an effective sterilizing agent but also accounts for its cancer-causing activity. The Institute mentions lymphoma and leukaemia as cancers most frequently reported to be associated with occupational exposure to ethylene oxide along with

stomach and breast cancers. How does anyone think this is going to work out with the constant testing regime being inflicted on adults and children at home and at school that will accumulate in the body anything that's on the swab? Doctors know best. It is vital for people to realise that 'hero' doctors 'know' only what the Big Pharma-dominated medical authorities tell them to 'know' and if they refuse to 'know' what they are told to 'know' they are out the door. They are mostly not physicians or healers, but repeaters of the official narrative – or else. I have seen alleged professional doctors on British television make shocking statements that we are supposed to take seriously. One called 'Dr' Amir Khan, who is actually telling patients how to respond to illness, said that men could take the birth pill to 'help slow down the effects of Covid-19'. In March, 2021, another ridiculous 'Covid study' by an American doctor proposed injecting men with the female sex hormone progesterone as a 'Covid' treatment. British doctor Nighat Arif told the BBC that face coverings were now going to be part of ongoing normal. Yes, the vaccine protects you, she said (evidence?) ... but the way to deal with viruses in the community was always going to come down to hand washing, face covering and keeping a physical distance. That's not what we were told before the 'vaccine' was circulating. Arif said she couldn't imagine ever again going on the underground or in a lift without a mask. I was just thanking my good luck that she was not my doctor when she said – in March, she thought we could 'have our nearest and dearest around us at home ... around Christmas and New Year! Her patronising delivery was the usual school teacher talking to six-year-olds as she repeated every government talking point and probably believed them all. If we have learned anything from the 'Covid' experience surely it must be that humanity's perception of doctors needs a fundamental rethink. NHS 'doctor' Sara Kayat told her television audience that the 'Covid vaccine' would '100 percent prevent hospitalisation and death'. Not even Big Pharma claimed that. We have to stop taking 'experts' at their word without question when so many of them are clueless and only repeating the party line on which their careers depend. That is not to say there are not brilliant doctors – there are and I have spoken to many of them since all this began – but you won't see them in the mainstream media or quoted by the psychopaths



and yes-people in government. Remember the name – Christian Drosten German virologist Christian Drosten, Director of Charité Institute of Virology in Berlin, became a national star after the pandemic hoax began. He was feted on television and advised the German government on 'Covid' policy. Most importantly to the wider world Drosten led a group that produced the 'Covid' testing protocol for the PCR test. What a remarkable feat given the PCR cannot test for infectious disease and even more so when you think that Drosten said that his method of testing for SARS-CoV-2 was developed 'without having virus material available'. He developed a test for a 'virus' that he didn't have and had never seen. Let that sink in as you survey the global devastation that came from what he did. The whole catastrophe of Drosten's 'test' was based on the alleged genetic sequence published by Chinese scientists on the Internet. We will see in the next chapter that this alleged 'genetic sequence' has never been produced by China or anyone and cannot be when there is no SARS-CoV-2. Drosten, however, doesn't seem to let little details like that get in the way. He was the lead author with Victor Corman from the same Charité Hospital of the paper 'Detection of 2019 novel coronavirus (2019-nCoV) by real-time PCR' published in a magazine called Eurosurveillance. This became known as the Corman-Drosten paper. In November, 2020, with human society devastated by the effects of the Corman-Drosten test baloney, the protocol was publicly challenged by 22 international scientists and independent researchers from Europe, the United States, and Japan. Among them were senior molecular geneticists, biochemists, immunologists, and microbiologists. They produced a document headed 'External peer review of the RTPCR test to detect SARS-Cov-2 Reveals 10 Major Flaws At The Molecular and Methodological Level: Consequences For False-Positive Results'. The flaws in the Corman-Drosten test included the following: The test is non-specific because of erroneous design Results are enormously variable The test is unable to discriminate between the whole 'virus' and It doesn't have positive or negative controls The test lacks a standard operating procedure It is unsupported by proper peer view The scientists said the PCR 'Covid' testing protocol was not founded on science and they demanded the Corman-Drosten paper be retracted by Eurosurveillance. They

said all present and previous Covid deaths, cases, and 'infection rates' should be subject to a massive retroactive inquiry. Lockdowns and travel restrictions should be reviewed and relaxed and those diagnosed through PCR to have 'Covid-19' should not be forced to isolate. Dr Kevin Corbej, a health researcher and nurse educator with a long academic career producing a stream of peer-reviewed publications at many UK universities, made the same point about the PCR test debacle. He said of the scientists' conclusions: 'Every scientific rationale for the development of that test has been totally destroyed by this paper. It's like Hiroshima/Nagasaki to the Covid test.' He said that China hadn't given them an isolated 'virus' when Drosten developed the test. Instead they had developed the test from a sequence in a gene bank.' Put another way ... they made it up! The scientists were supported in this contention by a Portuguese appeals court which ruled in November, 2020, that PCR tests are unreliable and it is unlawful to quarantine people based solely on a PCR test. The point about China not providing an isolated virus must be true when the 'virus' has never been isolated to this day and the consequences of that will become clear. Drosten and company produced this useless 'protocol' right on cue in January, 2020, just as the 'virus' was said to be moving westward and it somehow managed to successfully pass a peer-review in 24 hours. In other words there was no peer-review for a test that would be used to decide who had 'Covid' and who didn't across the world. The Cult-created, Gates-controlled World Health Organization immediately recommended all its nearly 200 member countries to use the Drosten PCR protocol to detect 'cases' and 'deaths'. The sting was underway and it continues to this day. So who is this Christian Drosten that produced the means through which death, destruction and economic catastrophe would be justified? His education background, including his doctoral thesis, would appear to be somewhat shrouded in mystery and his track record is dire as with another essential player in the 'Covid' hoax, the Gates-funded Professor Neil Ferguson at the Gates-funded Imperial College in London of whom more shortly. Drosten predicted in 2003 that the alleged original SARS 'virus' (SARS-1) was an epidemic that could have serious effects on economies and an effective vaccine would take at least two years to produce. Drosten's

answer to every alleged 'outbreak' is a vaccine which you won't be shocked to know. What followed were just 774 official deaths worldwide and none in Germany where there were only nine cases. That is even if you believe there ever was a SARS 'virus' when the evidence is zilch and I will expand on this in the next chapter. Drosten claims to be co-discoverer of 'SARS-1' and developed a test for it in 2003. He was screaming warnings about 'swine flu' in 2009 and how it was a widespread infection far more severe than any dangers from a vaccine could be and people should get vaccinated. It would be helpful for Drosten's vocal chords if he simply recorded the words 'the virus is deadly and you need to get vaccinated' and copies could be handed out whenever the latest made-up threat comes along. Drosten's swine flu epidemic never happened, but Big Pharma didn't mind with governments spending hundreds of millions on vaccines that hardly anyone bothered to use and many who did wished they hadn't. A study in 2010 revealed that the risk of dying from swine flu, or H1N1, was no higher than that of the annual seasonal flu which is what at least most of 'it' really was as in the case of 'Covid-19'. A media investigation into Drosten asked how with such a record of inaccuracy he could be the government adviser on these issues. The answer to that question is the same with Drosten, Ferguson and Fauci – they keep on giving the authorities the 'conclusions' and 'advice' they want to hear. Drosten certainly produced the goods for them in January, 2020, with his PCR protocol garbage and provided the foundation of what German internal medicine specialist Dr Claus Köhnlein, co-author of Virus Mania, called the 'test pandemic'. The 22 scientists in the Eurosurveillance challenge called out conflicts of interest within the Drosten 'protocol' group and with good reason. Olfert Landt, a regular co-author of Drosten 'studies', owns the biotech company TIB Molbiol Syntheselabor GmbH in Berlin which manufactures and sells the tests that Drosten and his mates come up with. They have done this with SARS, Enterotoxigenic E. coli (ETEC), MERS, Zika 'virus', yellow fever, and now 'Covid'. Landt told the Berliner Zeitung The testing, design and development came from the Charité [Drosten and Corman]. We simply implemented it immediately in the form of a kit. And if we don't have the virus, which originally only existed in Wuhan, we can make a synthetic gene to simulate the

genome of the virus. That's what we did very quickly. This is more confirmation that the Drosten test was designed without access to the 'virus' and only a synthetic simulation which is what SARS-CoV-2 really is – a computer-generated synthetic fiction. It's quite an enterprise they have going here. A Drosten team decides what the test for something should be and Landt's biotech company flogs it to governments and medical systems across the world. His company must have made an absolute fortune since the 'Covid' hoax began. Dr Reiner Fuellmich, a prominent German consumer protection trial lawyer in Germany and California, is on Drosten's case and that of Tedros at the World Health Organization for crimes against humanity with a class-action lawsuit being prepared in the United States and other legal action in Germany. Scamming the world with a 'virus' that doesn't exist would seem impossible on the face of it, but not if you have control of the relatively few people that make policy decisions and the great majority of the global media. Remember it's not about changing 'real' reality it's about controlling perception of reality. You don't have to make something happen you only have make people believe that it's happening. Renegade Minds understand this and are therefore much harder to swindle. 'Covid-19' is not a 'real' 'virus'. It's a mind virus, like a computer virus, which has infected the minds, not the bodies, of billions. It all started, publically at least, in China and that alone is of central significance. The Cult was behind the revolution led by its asset Mao Zedong, or Chairman Mao, which established the People's Republic of China on October 1st, 1949. It should have been called The Cult's Republic of China, but the name had to reflect the recurring illusion that vicious dictatorships are run by and for the people (see all the 'Democratic Republics' controlled by tyrants). In the same way we have the 'Biden' Democratic Republic of America officially ruled by a puppet tyrant (at least temporarily) on behalf of Cult tyrants. The creation of Mao's merciless communist/fascist dictatorship was part of a frenzy of activity by the Cult at the conclusion of World War Two which, like the First World War, it had instigated through its assets in Germany, Britain, France, the United States and elsewhere. Israel was formed in 1948; the Soviet Union expanded its 'Iron Curtain' control, influence and military power with the Warsaw Pact communist alliance

in 1955; the United Nations was formed in 1945 as a Cult precursor to world government; and a long list of world bodies would be established including the World Health Organization (1948), World Trade Organization (1948 under another name until 1995), International Monetary Fund (1945) and World Bank (1944). Human society was redrawn and hugely centralised in the global Problem-Reaction- Solution that was World War Two. All these changes were significant. Israel would become the headquarters of the Sabbatians and the revolution in China would prepare the ground and control system for the events of 2019/2020. Renegade Minds know there are no borders except for public consumption. The Cult is a seamless, borderless global entity and to understand the game we need to put aside labels like borders, nations, countries, communism, fascism and democracy. These delude the population into believing that countries are ruled within their borders by a government of whatever shade when these are mere agencies of a global power. America's illusion of democracy and China's communism/fascism are subsidiaries – vehicles – for the same agenda. We may hear about conflict and competition between America and China and on the lower levels that will be true; but at the Cult level they are branches of the same company in the way of the McDonald's example I gave earlier. I have tracked in the books over the years support by US governments of both parties for Chinese Communist Party infiltration of American society through allowing the sale of land, even military facilities, and the acquisition of American business and university influence. All this is underpinned by the infamous stealing of intellectual property and technological know-how. Cult-owned Silicon Valley corporations waive their fraudulent 'morality' to do business with human-rights- free China; Cult-controlled Disney has become China's PR department; and China in effect owns 'American' sports such as basketball which depends for much of its income on Chinese audiences. As a result any sports player, coach or official speaking out against China's horrific human rights record is immediately condemned or fired by the China-worshipping National Basketball Association. One of the first acts of China-controlled Biden was to issue an executive order telling federal agencies to stop making references to the 'virus' by the 'geographic location of its origin'.

Long-time Congressman Jerry Nadler warned that criticising China, America's biggest rival, leads to hate crimes against Asian people in the United States. So shut up you bigot. China is fast closing in on Israel as a country that must not be criticised which is apt, really, given that Sabbatians control them both. The two countries have developed close economic, military, technological and strategic ties which include involvement in China's 'Silk Road' transport and economic initiative to connect China with Europe. Israel was the first country in the Middle East to recognise the establishment of Mao's tyranny in 1950 months after it was established. Project Wuhan – the 'Covid' Psyop I emphasise again that the Cult plays the long game and what is happening to the world today is the result of centuries of calculated manipulation following a script to take control step-by-step of every aspect of human society. I will discuss later the common force behind all this that has spanned those centuries and thousands of years if the truth be told. Instigating the Mao revolution in China in 1949 with a 2020 'pandemic' in mind is not only how they work – the 71 years between them is really quite short by the Cult's standards of manipulation preparation. The reason for the Cult's Chinese revolution was to create a fiercely-controlled environment within which an extreme structure for human control could be incubated to eventually be unleashed across the world. We have seen this happen since the 'pandemic' emerged from China with the Chinese control-structure founded on AI technology and tyrannical enforcement sweep across the West. Until the moment when the Cult went for broke in the West and put its fascism on public display Western governments had to pay some lip-service to freedom and democracy to not alert too many people to the tyranny-in-the-making. Freedoms were more subtly eroded and power centralised with covert government structures put in place waiting for the arrival of 2020 when that smokescreen of 'freedom' could be dispensed with. The West was not able to move towards tyranny before 2020 anything like as fast as China which was created as a tyranny and had no limits on how fast it could construct the Cult's blueprint for global control. When the time came to impose that structure on the world it was the same Cult-owned Chinese communist/fascist government that provided the excuse – the 'Covid pandemic'. It was

absolutely crucial to the Cult plan for the Chinese response to the 'pandemic' – draconian lockdowns of the entire population – to become the blueprint that Western countries would follow to destroy the livelihoods and freedom of their people. This is why the Cult- owned, Gates-owned, WHO Director-General Tedros said early on: The Chinese government is to be congratulated for the extraordinary measures it has taken to contain the outbreak. China is actually setting a new standard for outbreak response and it is not an exaggeration. Forbes magazine said of China: '... those measures protected untold millions from geĵing the disease'. The Rockefeller Foundation 'epidemic scenario' document in 2010 said 'prophetically': However, a few countries did fare better – China in particular. The Chinese government's quick imposition and enforcement of mandatory quarantine for all citizens, as well as its instant and near-hermetic sealing off of all borders, saved millions of lives, stopping the spread of the virus far earlier than in other countries and enabling a swifter post-pandemic recovery. Once again – spooky. The first official story was the 'bat theory' or rather the bat diversion. The source of the 'virus outbreak' we were told was a "wet market" in Wuhan where bats and other animals are bought and eaten in horrifically unhygienic conditions. Then another story emerged through the alternative media that the 'virus' had been released on purpose or by accident from a BSL-4 (biosafety level 4) laboratory in Wuhan not far from the wet market. The lab was reported to create and work with lethal concoctions and bioweapons. Biosafety level 4 is the highest in the World Health Organization system of safety and containment. Renegade Minds are aware of what I call designer manipulation. The ideal for the Cult is for people to buy its prime narrative which in the opening salvoes of the 'pandemic' was the wet market story. It knows, however, that there is now a considerable worldwide alternative media of researchers sceptical of anything governments say and they are oĴen given a version of events in a form they can perceive as credible while misdirecting them from the real truth. In this case let them think that the conspiracy involved is a 'bioweapon virus' released from the Wuhan lab to keep them from the real conspiracy – there is no 'virus'. The WHO's current position on the source of the outbreak at the time of writing appears to be: 'We haven't got a

clue, mate.' This is a good position to maintain mystery and bewilderment. The inner circle will know where the 'virus' came from – nowhere. The bottom line was to ensure the public believed there was a 'virus' and it didn't much matter if they thought it was natural or had been released from a lab. The belief that there was a 'deadly virus' was all that was needed to trigger global panic and fear. The population was were told. They had to or they were 'all gonna die'. In March, 2020, information began to come my way from real doctors and scientists and my own additional research which had my intuition screaming: 'Yes, that's it! There is no virus.' The 'bioweapon' was not the 'virus'; it was the 'vaccine' already being talked about that would be the bioweapon. My conclusion was further enhanced by happenings in Wuhan. The 'virus' was said to be sweeping the city and news footage circulated of people collapsing in the street (which they've never done in the West with the same 'virus'). The Chinese government was building 'new hospitals' in a matter of ten days to 'cope with demand' such was the virulent nature of the 'virus'. Yet in what seemed like no time the 'new hospitals' closed – even if they even opened – and China declared itself 'virus-free'. It was back to business as usual. This was more propaganda to promote the Chinese draconian lockdowns in the West as the way to 'beat the virus'. Trouble was that we subsequently had lockdown after lockdown, but never business as usual. As the people of the West and most of the rest of the world were caught in an ever-worsening spiral of lockdown, social distancing, masks, isolated old people, families forced apart, and livelihood destruction, it was party-time in Wuhan. Pictures emerged of thousands of people enjoying pool parties and concerts. It made no sense until you realised there never was a 'virus' and the whole thing was a Cult set-up to transform human society out of one its major global strongholds – China. How is it possible to deceive virtually the entire world population into believing there is a deadly virus when there is not even a 'virus' let alone a deadly one? It's nothing like as difficult as you would think and that's clearly true because it happened. Postscript: See end of book Postscript for more on the 'Wuhan lab virus release' story which the authorities and media were pushing heavily in the summer of 2021 to divert attention from the truth that the 'Covid virus' is pure invention. There



is no 'virus' You can fool some of the people all of the time, and all of the people some of the time, but you cannot fool all of the people all of the time the greatest form of mind control is repetition. The more you repeat the same mantra of alleged 'facts' the more will accept them to be true. It becomes an 'everyone knows that, mate'. If you can also censor any other version or alternative to your alleged 'facts' you are pretty much home and cooking. By the start of 2020 the Cult owned the global mainstream media almost in its entirety to spew out its 'Covid' propaganda and ignore or discredit any other information and view. Cult-owned social media platforms in Cult-owned Silicon Valley were poised and ready to unleash a campaign of ferocious censorship to obliterate all but the official narrative. To complete the circle many demands for censorship by Silicon Valley were led by the mainstream media as 'journalists' became full-out enforcers for the Cult both as propagandists and censors. Part of this has been the influx of young people straight out of university who have become 'journalists' in significant positions. They have no experience and a headful of programmed perceptions from their years at school and university at a time when today's young are the most perceptually-targeted generations in known human history given the insidious impact of technology. They enter the media perceptually prepared and ready to repeat the narratives of the system that programmed them to repeat its narratives. The BBC has a truly pathetic 'specialist disinformation reporter' called Marianna Spring who fits this bill perfectly. She is clueless about the world, how it works and what is proper journalist would do and system-serving hacks like Spring wouldn't dare to do or even see the need to do. They are too busy licking the arse of authority which can never be wrong and, in the case of the BBC propaganda programme, Panorama, contacting payments systems such as PayPal to have a donations page taken down for a film company making documentaries questioning vaccines. Even the BBC soap opera EastEnders included a disgracefully biased scene in which an inarticulate white working class woman was made to look foolish for questioning the 'vaccine' while a well-spoken black man and Asian woman promoted the government narrative. It ticked every BBC box and the fact that the black and minority community was resisting the

'vaccine' had nothing to do with the way the scene was written. The BBC has become a disgusting tyrannical propaganda and censorship operation that should be defunded and disbanded and a free media take its place with a brief to stop censorship instead of demanding it. A BBC 'interview' with Gates goes something like: 'Mr Gates, sir, if I can call you sir, would you like to tell our audience why you are such a great man, a wonderful humanitarian philanthropist, and why you should absolutely be allowed as a software salesman to decide health policy for approaching eight billion people? Thank you, sir, please sir.' Propaganda programming has been incessant and merciless and when all you hear is the same story from the media, repeated by those around you who have only heard the same story, is it any wonder that people on a grand scale believe absolute mendacious garbage to be true? You are about to see, too, why this level of information control is necessary when the official 'Covid' narrative is so nonsensical and unsupportable by the evidence.

### Structure of Deceit

The pyramid structure through which the 'Covid' hoax has been manifested is very simple and has to be to work. As few people as possible have to be involved with full knowledge of what they are pyramid are the inner core of the Cult which controls Bill Gates who, in turn, controls the World Health Organization through his pivotal funding and his puppet Director-General mouthpiece, Tedros. Before he was appointed Tedros was chair of the Gates-founded Global Fund to 'fight against AIDS, tuberculosis and malaria', a board member of the Gates-funded 'vaccine alliance' GAVI, and on the board of another Gates-funded organisation. Gates owns him and picked him for a specific reason – Tedros is a crook and worse. 'Dr' Tedros (he's not a medical doctor, the first WHO chief not to be) was a member of the tyrannical Marxist government of Ethiopia for decades with all its human rights abuses. He has faced allegations of corruption and misappropriation of funds and was exposed three times for covering up cholera epidemics while Ethiopia's health minister. Tedros appointed the mass-murdering genocidal Zimbabwe dictator Robert Mugabe as a WHO goodwill ambassador for public health which, as with Tedros, is like appointing a psychopath to run a peace and love campaign. The move was so ridiculous that he had to

drop Mugabe in the face of widespread condemnation. American economist David Steinman, a Nobel peace prize nominee, lodged a complaint with the International Criminal Court in The Hague over alleged genocide by Tedros when he was Ethiopia's foreign minister. Steinman says Tedros was a 'crucial decision maker' who directed the actions of Ethiopia's security forces from 2013 to 2015 and one of three officials in charge when those security services embarked on the 'killing' and 'torturing' of Ethiopians. You can see where Tedros is coming from and it's sobering to think that he has been the vehicle for Gates and the Cult to direct the global response to 'Covid'. Think about that. A psychopathic Cult dictates to psychopath Gates who dictates to psychopath Tedros who dictates how countries of the world must respond to a 'Covid virus' never scientifically shown to exist. At the same time psychopathic Cult-owned Silicon Valley information giants like Google, YouTube, Facebook and Twitter announced very early on that they would give the Cult/Gates/Tedros/WHO version of the narrative free advertising and censor those who challenged their intelligence-insulting, mendacious story. The next layer in the global 'medical' structure below the Cult, Gates and Tedros are the chief medical officers and science 'advisers' in each of the WHO member countries which means virtually all of them. Medical officers and arbiters of science (they're not) then take the WHO policy and recommended responses and impose them on their country's population while the political 'leaders' say they are deciding policy (they're clearly not) by 'following the science' on the advice of the 'experts' – the same medical officers and science 'advisers' (dictators). In this way with the rarest of exceptions the entire world followed the same policy of lockdown, people distancing, masks and 'vaccines' dictated by the psychopathic Cult, psychopathic Gates and psychopathic Tedros who we are supposed to believe give a damn about the health of the world population they are seeking to enslave. That, amazingly, is all there is to it in terms of crucial decision-making. Medical staff in each country then follow like sheep the dictates of the shepherds at the top of the national medical hierarchies – chief medical officers and science 'advisers' who themselves follow like sheep the shepherds of the World Health Organization and the Cult. Shepherds at the national level often have major funding and other connections

to Gates and his Bill and Melinda Gates Foundation which carefully hands out money like confetti at a wedding to control the entire global medical system from the WHO down. Follow the money Christopher Whitty, Chief Medical Adviser to the UK Government at the centre of 'virus' policy, a senior adviser to the government's Scientific Advisory Group for Emergencies (SAGE), and Executive Board member of the World Health Organization, was given a grant of \$40 million by the Bill and Melinda Gates Foundation for malaria research in Africa. The BBC described the unelected Whitty as 'the official who will probably have the greatest impact on our everyday lives of any individual policymaker in modern times' and so it turned out. What Gates and Tedros have said Whitty has done like his equivalents around the world. Patrick Vallance, co-chair of SAGE and the government's Chief Scientific Adviser, is a former executive of Big Pharma giant GlaxoSmithKline with its fundamental financial and business connections to Bill Gates. In September, 2020, it was revealed that Vallance owned a deferred bonus of shares in GlaxoSmithKline worth £600,000 while the company was 'developing' a 'Covid vaccine'. Move along now – nothing to see here – what could possibly be wrong with that? Imperial College in London, a major player in 'Covid' policy in Britain and elsewhere with its 'Covid-19' Response Team, is funded by Gates and has big connections to China while the now infamous Professor Neil Ferguson, the useless 'computer modeller' at Imperial College is also funded by Gates. Ferguson delivered the dramatically inaccurate excuse for the first lockdowns (much more in the next chapter). The Institute for Health Metrics and Evaluation (IHME) in the United States, another source of outrageously false 'Covid' computer models to justify lockdowns, is bankrolled by Gates who is a vehement promotor of lockdowns. America's version of Whitty and Vallance, the again now infamous Anthony Fauci, has connections to 'Covid vaccine' maker Moderna as does Bill Gates through funding from the Bill and Melinda Gates Foundation. Fauci is director of the National Institute of Allergy and Infectious Diseases (NIAID), a major recipient of Gates money, and they are very close. Deborah Birx who was appointed White House Coronavirus Response Coordinator in February, 2020, is yet another with ties to Gates. Everywhere you look at the different elements around the world behind the

coordination and decision making of the 'Covid' hoax there is Bill Gates and his money. They include the World Health Organization; Centers for Disease Control (CDC) in the United States; National Institutes of Health (NIH) of Anthony Fauci; Imperial College and Neil Ferguson; the London School of Hygiene where Chris Whitty worked; Regulatory agencies like the UK Medicines & Healthcare products Regulatory Agency (MHRA) which gave emergency approval for 'Covid vaccines'; Wellcome Trust; GAVI, the Vaccine Alliance; the Coalition for Epidemic Preparedness Innovations (CEPI); Johns Hopkins University which has compiled the false 'Covid' figures; and the World Economic Forum. A Nationalfile.com article said: Gates has a lot of pull in the medical world, he has a multi-million dollar relationship with Dr. Fauci, and Fauci originally took the Gates line supporting vaccines and casting doubt on [the drug hydroxychloroquine]. Coronavirus response team member Dr. Deborah Birx, appointed by former president Obama to serve as United States Global AIDS Coordinator, also sits on the board of a group that has received billions from Gates' foundation, and Birx reportedly used a disputed Bill Gates-funded model for the White House's Coronavirus effort. Gates is a big proponent for a population lockdown scenario for the Coronavirus outbreak. Another funder of Moderna is the Defense Advanced Research Projects Agency (DARPA), the technology-development arm of the Pentagon and one of the most sinister organisations on earth. DARPA had a major role with the CIA covert technology-funding operation In-Q-Tel in the development of Google and social media which is now at the centre of global censorship. Fauci and Gates are extremely close and openly admit to talking regularly about 'Covid' policy, but then why wouldn't Gates have a seat at every national 'Covid' table after his Foundation committed \$1.75 billion to the 'fight against Covid-19'. When passed through our Orwellian Translation Unit this means that he has bought and paid for the Cult-driven 'Covid' response worldwide. Research the major 'Covid' response personnel in your own country and you will find the same Gates funding and other connections again and again. Medical and science chiefs following World Health Organization 'policy' sit atop a medical hierarchy in their country of administrators, doctors and nursing staff. These 'subordinates' are told they must work and

behave in accordance with the policy delivered from the 'top' of the national 'health' pyramid which is largely the policy delivered by the WHO which is the policy delivered by Gates and the Cult. The whole 'Covid' narrative has been imposed on medical staff by a climate of fear although great numbers don't even need that to comply. They do so through breathtaking levels of ignorance and include doctors who go through life simply repeating what Big Pharma and their hierarchical masters tell them to say and believe. No wonder Big Pharma 'medicine' is one of the biggest killers on The same top-down system of intimidation operates with regard to the Cult Big Pharma cartel which also dictates policy through national and global medical systems in this way. The Cult and Big Pharma agendas are the same because the former controls and owns the latter. 'Health' administrators, doctors, and nursing staff are told to support and parrot the dictated policy or they will face consequences which can include being fired. How sad it's been to see medical staff meekly repeating and imposing Cult policy without question and most of those who can see through the deceit are only willing to speak anonymously off the record. They know what will happen if their identity is known. This has led the courageous few to expose the lies about the 'virus', face masks, overwhelmed hospitals that aren't, and the dangers of the 'vaccine' that isn't a vaccine. When these medical professionals and scientists, some renowned in their field, have taken to the Internet to expose the truth their articles, comments and videos have been deleted by Cult-owned Facebook, Twitter and YouTube. What a real head-shaker to see YouTube videos with leading world scientists and highly qualified medical specialists with an added link underneath to the notorious Cult propaganda website Wikipedia to find the 'facts' about the same HIV – the 'Covid' trial-run I'll give you an example of the consequences for health and truth that come from censorship and unquestioning belief in official narratives. The story was told by PCR inventor Kary Mullis in his book *Dancing Naked in the Mind Field*. He said that in 1984 he accepted as just another scientific fact that Luc Montagnier of France's Pasteur Institute and Robert Gallo of America's National Institutes of Health had independently discovered that a 'retrovirus' dubbed HIV (human immunodeficiency virus) caused AIDS. They were, after all,

Mullis writes, specialists in retroviruses. This is how the medical and science pyramids work. Something is announced or assumed and then becomes an everybody-knows-that purely through repetition of the assumption as if it is fact. Complete crap becomes accepted truth with no supporting evidence and only repetition of the crap. This is how a 'virus' that doesn't exist became the 'virus' that changed the world. The HIV-AIDS fairy story became a multi-billion pound industry and the media poured out propaganda terrifying the world about the deadly HIV 'virus' that caused the lethal AIDS. By then Mullis was working at a lab in Santa Monica, California, to detect retroviruses with his PCR test in blood virologist where he could find a reference for HIV being the cause of AIDS. 'You don't need a reference,' the virologist said ... 'Everybody knows it.' Mullis said he wanted to quote a reference in the report he source of such an important discovery when everyone else seemed to. The virologist suggested he cite a report by the Centers for Disease Control and Prevention (CDC) on morbidity and mortality. Mullis read the report, but it only said that an organism had been identified and did not say how. The report did not identify the original scientific work. Physicians, however, assumed (key recurring theme) that if the CDC was convinced that HIV caused AIDS then proof must exist. Mullis continues: I did computer searches. Neither Montagnier, Gallo, nor anyone else had published papers describing experiments which led to the conclusion that HIV probably caused AIDS. I read the papers in Science for which they had become well known as AIDS doctors, but all they had said there was that they had found evidence of a past infection by something which was probably HIV in some AIDS patients. They found antibodies. Antibodies to viruses had always been considered evidence of past disease, not present disease. Antibodies signaled that the virus had been defeated. The patient had saved himself. There was no indication in these papers that this virus caused a disease. They didn't show that everybody with the antibodies had the disease. In fact they found some healthy people with antibodies. Mullis asked why their work had been published if Montagnier and Gallo hadn't really found this evidence, and why had they been fighting so hard to get credit for the discovery? He says he was hesitant to write 'HIV is the probable cause of AIDS' until he found

published evidence to support that. 'Tens of thousands of scientists research based on this idea,' Mullis writes. 'The reason had to be there somewhere; otherwise these people would not have allowed their research to seîle into one narrow channel of investigation.' He said he lectured about PCR at numerous meetings where people were always talking about HIV and he asked them how they knew that HIV was the cause of AIDS: Everyone said something. Everyone had the answer at home, in the office, in some drawer. They all knew, and they would send me the papers as soon as they got back. But I never got any papers. Nobody ever sent me the news about how AIDS was caused by HIV. Eventually Mullis was able to ask Montagnier himself about the reference proof when he lectured in San Diego at the grand opening of the University of California AIDS Research Center. Mullis says this was the last time he would ask his question without showing anger. Montagnier said he should reference the CDC report. 'I read it', Mullis said, and it didn't answer the question. 'If Montagnier didn't know the answer who the hell did?' Then one night Mullis was driving when an interview came on National Public Radio with Peter Duesberg, a prominent virologist at Berkeley and a California Scientist of the Year. Mullis says he finally understood why he could not find references that connected HIV to AIDS – there weren't any! No one had ever proved that HIV causes AIDS even though it had spawned a multi-billion pound global industry and the media was repeating this as fact every day in their articles and broadcasts terrifying the shit out of people about AIDS and giving the impression that a positive test for HIV (see 'Covid') was a death sentence. Duesberg was a threat to the AIDS gravy train and the agenda that underpinned it. He was therefore abused and castigated aĝer he told the Proceedings of the National Academy of Sciences there was no good evidence implicating the new 'virus'. Editors rejected his manuscripts and his research funds were deleted. Mullis points out that the CDC has defined AIDS as one of more than 30 diseases if accompanied by a positive result on a test that detects antibodies to HIV; but those same diseases are not defined as AIDS cases when antibodies are not detected: If an HIV-positive woman develops uterine cancer, for example, she is considered to have AIDS. If she is not HIV positive, she simply has uterine cancer. An



HIV-positive man with tuberculosis has AIDS; if he tests negative he simply has tuberculosis. If he lives in Kenya or Colombia, where the test for HIV antibodies is too expensive, he is simply presumed to have the antibodies and therefore AIDS, and therefore he can be treated in the World Health Organization's clinic. It's the only medical help available in some places. And it's free, because the countries that support WHO are worried about AIDS. Mullis accuses the CDC of continually adding new diseases (see ever more 'Covid symptoms') to the grand AIDS definition and of virtually doctoring the books to make it appear as if the disease continued to spread. He cites how in 1993 the CDC enormously broadened its AIDS definition and county health authorities were delighted because they received \$2,500 per year from the Federal government for every reported AIDS case. Ladies and gentlemen, I have just described, via Kary Mullis, the 'Covid pandemic' of 2020 and beyond. Every element is the same and it's been pulled off in the same way by the same networks. The 'Covid virus' exists? Okay – prove it. Er ... still waiting What Kary Mullis described with regard to 'HIV' has been repeated with 'Covid'. A claim is made that a new, or 'novel', infection has been found and the entire medical system of the world repeats that as fact exactly as they did with HIV and AIDS. No one in the mainstream asks rather relevant questions such as 'How do you know?' and 'Where is your proof?' The SARS-Cov-2 'virus' and the 'Covid-19 disease' became an overnight 'everybody-knows-that'. The origin could be debated and mulled over, but what you could not suggest was that 'SARS-Cov-2' didn't exist. That would be ridiculous. 'Everybody knows' the 'virus' exists. Well, I didn't for one along with American proper doctors like Andrew Kaufman and Tom Cowan and long-time American proper journalist Jon Rappaport. We dared to pursue the obvious and simple question: 'Where's the evidence?' The overwhelming majority in medicine, journalism and the general public did not think to ask that. After all, everyone knew there was a new 'virus'. Everyone was saying so and I heard it on the BBC. Some would eventually argue that the 'deadly virus' was nothing like as deadly as claimed, but few would venture into the realms of its very existence. Had they done so they would have found that the evidence for that claim had gone AWOL as with HIV causes AIDS. In fact, not even that. For something to go AWOL it

has to exist in the first place and scientific proof for a 'SARS-Cov-2' can be filed under nothing, nowhere and zilch. Dr Andrew Kaufman is a board-certified forensic psychiatrist in New York State, a Doctor of Medicine and former Assistant Professor and Medical Director of Psychiatry at SUNY Upstate Medical University, and Medical Instructor of Hematology and Oncology at the Medical School of South Carolina. He also studied biology at the Massachusetts Institute of Technology (MIT) and trained in Psychiatry at Duke University. Kaufman is retired from allopathic medicine, but remains a consultant and educator on natural healing, I saw a video of his very early on in the 'Covid' hoax in which he questioned claims about the 'virus' in the absence of any supporting evidence and with plenty pointing the other way. I did everything I could to circulate his work which I felt was asking the pivotal questions that needed an answer. I can recommend an excellent pull-together interview he did with the website The Last Vagabond entitled Dr Andrew Kaufman: Virus Isolation, Terrain Theory and Covid-19 and his website is [andrewkaufmanmd.com](http://andrewkaufmanmd.com). Kaufman is not only a forensic psychiatrist; he is forensic in all that he does. He always reads original scientific papers, experiments and studies instead of second-third-fourth-hand reports about the 'virus' in the media which are repeating the repeated repetition of the narrative. When he did so with the original Chinese 'virus' papers Kaufman realised that there was no evidence of a 'SARS-Cov-2'. They had never – from the start – shown it to exist and every repeat of this claim worldwide was based on the accepted existence of proof that was nowhere to be found – see Kary Mullis and HIV. Here we go Kaufman discovered that the Chinese authorities immediately concluded that the cause of an illness that broke out among about 200 initial patients in Wuhan was a 'new virus' when there were no grounds to make that conclusion. The alleged 'virus' was not isolated from other genetic material in their samples and then shown through a system known as Koch's postulates to be the causative agent of the illness. The world was told that the SARS-Cov-2 'virus' caused a disease they called 'Covid-19' which had 'flu-like' symptoms and could lead to respiratory problems and pneumonia. If it wasn't so tragic it would almost be funny. 'Flu-like' symptoms? Pneumonia? Respiratory disease? What in CHINA and particularly in Wuhan, one

of the most polluted cities in the world with a resulting epidemic of respiratory disease?? Three hundred thousand people get pneumonia in China every year and there are nearly a billion cases worldwide of 'flu-like symptoms'. These have a whole range of causes – including pollution in Wuhan – but no other possibility was credibly considered in late 2019 when the world was told there was a new and deadly 'virus'. The global prevalence of pneumonia and 'flu-like systems' gave the Cult networks unlimited potential to re- diagnose these other causes as the mythical 'Covid-19' and that is what they did from the very start. Kaufman revealed how Chinese medical and science authorities (all subordinates to the Cult-owned communist government) took genetic material from the lungs of only a few of the first patients. The material contained their own cells, bacteria, fungi and other microorganisms living in their bodies. The only way you could prove the existence of the 'virus' and its responsibility for the alleged 'Covid-19' was to isolate the virus from all the other material – a process also known as 'purification' – and then follow the postulates sequence developed in the late 19th century by German physician and bacteriologist Robert Koch which became the 'gold standard' for connecting an alleged causation agent to a disease: 1. The microorganism (bacteria, fungus, virus, etc.) must be present in every case of the disease and all patients must have the same symptoms. It must also not be present in healthy 2. The microorganism must be isolated from the host with the disease. If the microorganism is a bacteria or fungus it must be grown in a pure culture. If it is a virus, it must be purified (i.e. containing no other material except the virus particles) from a clinical sample. 3. The specific disease, with all of its characteristics, must be reproduced when the infectious agent (the purified virus or a pure culture of bacteria or fungi) is inoculated into a healthy, susceptible host. 4. The microorganism must be recoverable from the experimentally infected host as in step Not one of these criteria has been met in the case of 'SARS-Cov-2' and 'Covid-19'. Not ONE. EVER. Robert Koch refers to bacteria and not viruses. What are called 'viral particles' are so minute (hence masks are useless by any definition) that they could only be seen aĜer the invention of the electron microscope in the 1930s and can still only be observed through that means. American

bacteriologist and virologist Thomas Milton Rivers, the so-called 'Father of Modern Virology' who was very significantly director of the Rockefeller Institute for Medical Research in the 1930s, developed a less stringent version of Koch's postulates to identify 'virus' causation known as 'Rivers criteria'. 'Covid' did not pass that process either. Some even doubt whether any 'virus' can be isolated from other particles containing genetic material in the Koch method. Freedom of Information requests in many countries asking for scientific proof that the 'Covid virus' has been purified and isolated and shown to exist have all come back with a 'we don't have that' and when this happened with a request to the UK Department of Health they added this comment: However, outside of the scope of the [Freedom of Information Act] and on a discretionary basis, the following information has been advised to us, which may be of interest. Most infectious diseases are caused by viruses, bacteria or fungi. Some bacteria or fungi have the capacity to grow on their own in isolation, for example in colonies on a petri dish. Viruses are different in that they are what we call 'obligate pathogens' – that is, they cannot survive or reproduce without infecting a host ... ... For some diseases, it is possible to establish causation between a microorganism and a disease by isolating the pathogen from a patient, growing it in pure culture and reintroducing it to a healthy organism. These are known as 'Koch's postulates' and were developed in 1882. However, as our understanding of disease and different disease-causing agents has advanced, these are no longer the method for determining causation [Andrew Kaufman asks why in that case are there two published articles falsely claiming to satisfy Koch's postulates]. It has long been known that viral diseases cannot be identified in this way as viruses cannot be grown in 'pure culture'. When a patient is tested for a viral illness, this is normally done by looking for the presence of antigens, or viral genetic code in a host with molecular biology techniques [Kaufman asks how you could know the origin of these chemicals without having a pure culture for comparison]. For the record 'antigens' are defined so: Invading microorganisms have antigens on their surface that the human body can recognise as being foreign – meaning not belonging to it. When the body recognises a foreign antigen, lymphocytes (white blood cells) produce antibodies, which are

complementary in shape to Notwithstanding that this is open to question in relation to 'SARS-Cov-2' the presence of 'antibodies' can have many causes and they are found in people that are perfectly well. Kary Mullis said: 'Antibodies ... had always been considered evidence of past disease, not present disease.' 'Covid' really is a computer 'virus' Where the UK Department of Health statement says 'viruses' are now 'diagnosed' through a 'viral genetic code in a host with molecular biology techniques', they mean ... the PCR test which its inventor said cannot test for infectious disease. They have no credible method of connecting a 'virus' to a disease and we will see that there is no scientific proof that any 'virus' causes any disease or there is any such thing as a 'virus' in the way that it is described. Tenacious Canadian researcher Christine Massey and her team made some 40 Freedom of Information requests to national public health agencies in different countries asking for proof that SARS-CoV-2 has been isolated and not one of them could supply that information. Massey said of her request in Canada: 'Freedom of Information reveals Public Health Agency of Canada has no record of 'SARS-COV-2' isolation performed by anyone, anywhere, ever.' If you accept the comment from the UK Department of Health it's because they can't isolate a 'virus'. Even so many 'science' papers claimed to have isolated the 'Covid virus' until they were questioned and had to admit they hadn't. A reply from the Robert Koch Institute in Germany was typical: 'I am not aware of a paper which purified isolated SARS-CoV-2.' So what the hell was Christian Drosten and his gang using to design the 'Covid' testing protocol that has produced all the illusory Covid' cases and 'Covid' deaths when the head of the Chinese version of the CDC admitted there was a problem right from the start in that the 'virus' had never been isolated/purified? Breathe deeply: What they are calling 'Covid' is actually created by a computer program i.e. they made it up – er, that's it. They took lung fluid, with many sources of genetic material, from one single person alleged to be infected with Covid-19 by a PCR test which they claimed, without clear evidence, contained a 'virus'. They used several computer programs to create a model of a theoretical virus genome sequence from more than fifty-six million small sequences of RNA, each of an unknown source, assembling them like a puzzle with no known solution. The

computer filled in the gaps with sequences from bits in the gene bank to make it look like a bat SARS-like coronavirus! A wave of the magic wand and poof, an in silico (computer-generated) genome, a scientific fantasy, was created. UK health researcher Dr Kevin Corbett made the same point with this analogy: ... It's like giving you a few bones and saying that's your fish. It could be any fish. Not even a skeleton. Here's a few fragments of bones. That's your fish ... It's all from gene bank and the bits of the virus sequence that weren't there they made up. They synthetically created them to fill in the blanks. That's what genetics is; it's a code. So it's ABBBCCDDD and you're missing some what you think is EEE so you put it in. It's all synthetic. You just manufacture the bits that are missing. This is the end result of the geneticization of virology. This is basically a computer virus. Further confirmation came in an email exchange between British citizen journalist Frances Leader and the government's Medicines & Healthcare Products Regulatory Agency (the Gates-funded MHRA) which gave emergency permission for untested 'Covid vaccines' to be used. The agency admitted that the 'vaccine' is not based on an isolated 'virus', but comes from a computer-generated model. Frances Leader was naturally banned from Cult-owned fascist Twitter for making this exchange public. The process of creating computer-generated alleged 'viruses' is called 'in silico' or 'in silicon' – computer chips – and the term 'in silico' is believed to originate with biological experiments using only a computer in 1989. 'Vaccines' involved with 'Covid' are also produced 'in silico' or by computer not a natural process. If the original 'virus' is nothing more than a made-up computer model how can there be 'new variants' of something that never existed in the first place? They are not new 'variants'; they are new computer models only minutely different to the original program and designed to further terrify the population into having the 'vaccine' and submitting to fascism. You want a 'new variant'? Click, click, enter – there you go. Tell the medical profession that you have discovered a 'South African variant', 'UK variants' or a 'Brazilian variant' and in the usual HIV-causes-AIDS manner they will unquestioningly repeat it with no evidence whatsoever to support these claims. They will go on television and then repeating what they have been told to be true and knowing that any deviation from that

would be career suicide. Big-time insiders will know it's a hoax, but much of the medical community is clueless about the way they are being played and themselves play the public 'coincidence' that AstraZeneca and Oxford University were conducting 'Covid vaccine trials' in the three countries – the UK, South Africa and Brazil – where the first three 'variants' were claimed to have 'broken out'. Here's your 'virus' – it's a unicorn

Dr Andrew Kaufman presented a brilliant analysis describing how the 'virus' was imagined into fake existence when he dissected an article published by Nature and written by 19 authors detailing alleged 'sequencing of a complete viral genome' of the 'new SARS- CoV-2 virus'. This computer-modelled in silico genome was used as a template for all subsequent genome sequencing experiments that resulted in the so-called variants which he said now number more than 6,000. The fake genome was constructed from more than 56 million individual short strands of RNA. Those little pieces were assembled into longer pieces by finding areas of overlapping sequences. The computer programs created over two million possible combinations from which the authors simply chose the longest one. They then compared this to a 'bat virus' and the computer 'alignment' rearranged the sequence and filled in the gaps! They called this computer-generated abomination the 'complete genome'. Dr Tom Cowan, a fellow medical author and collaborator with Kaufman, said such computer-generation constitutes scientific fraud and he makes this superb analogy: Here is an equivalency: A group of researchers claim to have found a unicorn because they found a piece of a hoof, a hair from a tail, and a snippet of a horn. They then add that information into a computer and program it to re-create the unicorn, and they then claim this computer re-creation is the real unicorn. Of course, they had never actually seen a unicorn so could not possibly have examined its genetic makeup to compare their samples with the actual unicorn's hair, hooves and horn. The researchers claim they decided which is the real genome of SARS-CoV-2 by 'consensus', sort of like a vote. Again, different computer programs will come up with different versions of the imaginary 'unicorn', so they come together as a group and decide which is the real This is how the 'virus' that has transformed the world was brought into fraudulent 'existence'.

Extraordinary, yes, but as the Nazis said the bigger the lie the more will believe it. Cowan, however, wasn't finished and he went on to identify what he called the real blockbuster in the paper. He quotes this section from a paper written by virologists and published by the CDC and then explains what it. Therefore, we examined the capacity of SARS-CoV-2 to infect and replicate in several common primate and human cell lines, including human adenocarcinoma cells (A549), human liver cells (HUH 7.0), and human embryonic kidney cells (HEK-293T). In addition to Vero E6 and Vero CCL81 cells. ... Each cell line was inoculated at high multiplicity of infection and examined 24h post-infection. No CPE was observed in any of the cell lines except in Vero cells, which grew to greater than 10 to the 7th power at 24 h post-infection. In contrast, HUH 7.0 and 293T showed only modest viral replication, and A549 cells were incompatible with SARS CoV-2 infection. Cowan explains that when virologists attempt to prove infection they have three possible 'hosts' or models on which they can test. The first was humans. Exposure to humans was generally not done for ethical reasons and has never been done with SARS-CoV-2 or any coronavirus. The second possible host was animals. Cowan said that forgoing for a moment that they never actually use purified virus when exposing animals they do use solutions that they claim contain the virus. Exposure to animals has been done with SARS-CoV-2 in an experiment involving mice and this is what they found: None of the wild (normal) mice got sick. In a group of genetically-modified mice, a statistically insignificant number lost weight and had slightly bristled fur, but they experienced nothing like the illness called 'Covid-19'. Cowan said the third method – the one they mostly rely on – is to inoculate solutions they say contain the virus onto a variety of tissue cultures. This process had never been shown to kill tissue unless the sample material was starved of nutrients and poisoned as part of the process. Yes, incredibly, in tissue experiments designed to show the 'virus' is responsible for killing the tissue they starve the tissue of nutrients and add toxic drugs including antibiotics and they do not have control studies to see if it's the starvation and poisoning that is degrading the tissue rather than the 'virus' they allege to be in there somewhere. You want me to pinch you? Yep, I understand. Tom Cowan said this about the



whole nonsensical farce as he explains what that quote from the CDC paper really means: The shocking thing about the above quote is that using their own methods, the virologists found that solutions containing SARS-CoV-2 – even in high amounts – were NOT, I repeat NOT, infective to any of the three human tissue cultures they tested. In plain English, this means they proved, on their terms, that this ‘new coronavirus’ is not infectious to human beings. It is ONLY infective to monkey kidney cells, and only then when you add two potent drugs (gentamicin and amphotericin), known to be toxic to kidneys, to the mix. My friends, read this again and again. These virologists, published by the CDC, performed a clear proof, on their terms, showing that the SARS-CoV-2 virus is harmless to human beings. That is the only possible conclusion, but, unfortunately, this result is not even mentioned in their conclusion. They simply say they can provide virus stocks cultured only on monkey Vero cells, thanks for coming. Cowan concluded: ‘If people really understood how this “science” was done, I would hope they would storm the gates and demand honesty, transparency and truth.’ Dr Michael Yeadon, former Vice President and Chief Scientific Adviser at drug giant Pfizer has been a vocal critic of the ‘Covid vaccine’ and its potential for multiple harm. He said in an interview in April, 2021, that ‘not one [vaccine] has the virus. He was asked why vaccines normally using a ‘dead’ version of a disease to activate the immune system were not used for ‘Covid’ and instead we had the synthetic methods of the ‘mRNA Covid vaccine’. Yeadon said that to do the former ‘you’d have to have some of [the virus] wouldn’t you?’ He added: ‘No-one’s got any – seriously.’ Yeadon said that surely they couldn’t have fooled the whole world for a year without having a virus, ‘but oddly enough ask around – no one’s got it’. He didn’t know why with all the ‘great labs’ around the world that the virus had not been isolated – ‘Maybe they’ve been too busy running bad PCR tests and vaccines that people don’t need.’ What is today called ‘science’ is not ‘science’ at all. Science is no longer what is, but whatever people can be manipulated to believe that it is. Real science has been hijacked by the Cult to dispense and produce the ‘expert scientists’ and contentions that suit the agenda of the Cult. How big-time this has happened with the ‘Covid’ hoax which is entirely based on fake science delivered by fake

'scientists' and fake 'doctors'. The human-caused climate change hoax is also entirely based on fake science delivered by fake 'scientists' and fake 'climate experts'. In both cases real scientists, climate experts and doctors have their views suppressed and deleted by the Cult-owned science establishment, media and Silicon Valley. This is the 'science' that politicians claim to be 'following' and a common denominator of 'Covid' and climate are Cult psychopaths Bill Gates and his mate Klaus Schwab at the Gates-funded World Economic Forum. But, don't worry, it's all just a coincidence and absolutely nothing to worry about. Zzzzzzzz. What is a 'virus' REALLY? Dr Tom Cowan is one of many contesting the very existence of viruses let alone that they cause disease. This is understandable when there is no scientific evidence for a disease-causing 'virus'. German virologist Dr Stefan Lanka won a landmark case in 2017 in the German Supreme Court over his contention that there is no such thing as a measles virus. He had offered a big prize for anyone who could prove there is and Lanka won his case when someone sought to claim the money. There is currently a prize of more than 225,000 euros on offer from an Isolate Truth Fund for anyone who can prove the isolation of SARS-CoV-2 and its genetic substance. Lanka wrote in an article headed 'The Misconception Called Virus' that scientists think a 'virus' is causing tissue to become diseased and degraded when in fact it is the processes they are using which do that – not a 'virus'. Lanka has done an important job in making this point clear as Cowan did in his analysis of the CDC paper. Lanka says that all claims about viruses as disease-causing pathogens are wrong and based on 'easily recognisable, understandable and verifiable misinterpretations.' Scientists believed they were working with 'viruses' in their laboratories when they were really working with 'typical particles of specific dying tissues or cells ...' Lanka said that the tissue decaying process claimed to be caused by a 'virus' still happens when no alleged 'virus' is involved. It's the process that does the damage and not a 'virus'. The genetic sample is deprived of nutrients, removed from its energy supply through removal from the body and then doused in toxic antibiotics to remove any bacteria. He confirms again that establishment scientists do not (pinch me) conduct control experiments to see if this is the case and if they did nonsense. He adds that during the

measles 'virus' court case he commissioned an independent laboratory to perform just such a control experiment and the result was that the tissues and cells died in the exact same way as with alleged 'infected' material. This is supported by a gathering number of scientists, doctors and researchers who reject what is called 'germ theory' or the belief in the body being infected by contagious sources emitted by other people. Researchers Dawn Lester and David Parker take the same stance in their highly-detailed and sourced book *What Really Makes You Ill – Why everything you thought you knew about disease is wrong* which was recommended to me by a number of medical professionals genuinely seeking the truth. Lester and Parker say there is no provable scientific evidence to show that a 'virus' can be transmitted between people or people and animals or animals and The definition also claims that viruses are the cause of many diseases, as if this has been definitively proven. But this is not the case; there is no original scientific evidence that definitively demonstrates that any virus is the cause of any disease. The burden of proof for any theory lies with those who proposed it; but none of the existing documents provides 'proof' that supports the claim that 'viruses' are pathogens. Dr Tom Cowan employs one of his clever analogies to describe the process by which a 'virus' is named as the culprit for a disease when what is called a 'virus' is only material released by cells detoxing themselves from infiltration by chemical or radiation poisoning. The tidal wave of technologically-generated radiation in the 'smart' modern world plus all the toxic food and drink are causing this to happen more than ever. Deluded 'scientists' misread this as a gathering impact of what they wrongly label 'viruses'. Paper can infect houses Cowan said in an article for davidicke.com – with his tongue only mildly in his cheek – that he believed he had made a tremendous discovery that may revolutionise science. He had discovered that small bits of paper are alive, 'well alive-ish', can 'infect' houses, and then reproduce themselves inside the house. The result was that this explosion of growth in the paper inside the house causes the house to explode, blowing it to smithereens. His evidence for this new theory is that in the past months he had carefully examined many of the houses in his neighbourhood and found almost no scraps of paper on the lawns and surrounds of the house. There was an

occasional stray label, but nothing more. Then he would return to these same houses a week or so later and with a few, not all of them, particularly the old and decrepit ones, he found to his shock and surprise they were littered with stray bits of paper. He knew then that the paper had infected these houses, made copies of itself, and blew up the house. A young boy on a bicycle at one of the sites told him he had seen a demolition crew using dynamite to explode the house the previous week, but Cowan dismissed this as the idle thoughts of silly boys because 'I was on to something big'. He was on to how 'scientists' mistake genetic material in the detoxifying process for something they call a 'virus'. Cowan said of his house and paper story: If this sounds crazy to you, it's because it should. This scenario is obviously nuts. But consider this admittedly embellished, for effect, current viral theory that all scientists, medical doctors and virologists currently believe. He takes the example of the 'novel SARS-Cov2' virus to prove the point. First they take someone with an undefined illness called 'Covid-19' and don't even attempt to find any virus in their sputum. Never mind the scientists still describe how this 'virus', which they have not located attaches to a cell receptor, injects its genetic material, in 'Covid's' case, RNA, into the cell. The RNA once inserted exploits the cell to reproduce itself and makes 'thousands, nay millions, of copies of itself ... Then it emerges victorious to claim its If you were to look in the scientific literature for proof, actual scientific proof, that uniform SARS-CoV2 viruses have been properly isolated from the sputum of a sick person, that actual spike proteins could be seen protruding from the virus (which has not been found), you would find that such evidence doesn't exist. If you go looking in the published scientific literature for actual pictures, proof, that these spike proteins or any viral proteins are ever attached to any receptor embedded in any cell membrane, you would also find that no such evidence exists. If you were to look for a video or documented evidence of the intact virus injecting its genetic material into the body of the cell, reproducing itself and then emerging victorious by budding off the cell membrane, you would find that no such evidence exists. The closest thing you would find is electron micrograph pictures of cellular particles, possibly attached to cell debris, both of which to be seen were stained by heavy

metals, a process that completely distorts their architecture within the living organism. This is like finding bits of paper stuck to the blown-up bricks, thereby proving the paper emerged by taking pieces of the bricks on its way out. The Enders baloney Cowan describes the 'Covid' story as being just as make-believe as his paper story and he charts back this fantasy to a Nobel Prize winner called John Enders (1897-1985), an American biomedical scientist who has been dubbed 'The Father of Modern Vaccines'. Enders is claimed to have 'discovered' the process of the viral culture which 'proved' that a 'virus' caused measles. Cowan explains how Enders did this 'by using the EXACT same procedure that has been followed by every virologist to find and characterize every new virus since 1954'. Enders took throat swabs from children with measles and immersed them in 2ml of milk. Penicillin (100u/ml) and the antibiotic streptomycin (50,g/ml) were added and the whole mix was centrifuged – rotated at high speed to separate large cellular debris from small particles and molecules as with milk and cream, for example. Cowan says that if the aim is to find little particles of genetic material ('viruses') in the snot from children with measles it would seem that the last thing you would do is mix the snot with other material – milk –that also has genetic material. 'How are you ever going to know whether whatever you found came from the snot or the milk?' He points out that streptomycin is a 'nephrotoxic' or poisonous-to-the-kidney drug. You will see the relevance of that shortly. Cowan says that it gets worse, much worse, when Enders describes the culture medium upon which the virus 'grows': 'The culture medium consisted of bovine amniotic fluid (90%), beef embryo extract (5%), horse serum (5%), antibiotics and phenol red as an indicator of cell metabolism.' Cowan asks incredulously: 'Did he just say that the culture medium also contained fluids and tissues that are themselves rich sources of genetic material?' The genetic cocktail, or 'medium', is inoculated onto tissue and cells from rhesus monkey kidney tissue. This is where the importance of streptomycin comes in and currently-used antimicrobials and other drugs that are poisonous to kidneys and used in ALL modern viral cultures (e.g. gentamicin, streptomycin, and amphotericin). Cowan asks: 'How are you ever going to know from this witch's brew where any genetic material comes from as we now have five different

sources of rich genetic material in our mix?’ Remember, he says, that all genetic material, whether from monkey kidney tissues, bovine serum, milk, etc., is made from the exact same components. The same central question returns: ‘How are you possibly going to know that it was the virus that killed the kidney tissue and not the toxic antibiotic and starvation rations on which you are growing the tissue?’ John Enders answered the question himself – you can’t: A second agent was obtained from an uninoculated culture of monkey kidney cells. The cytopathic changes [death of the cells] it induced in the unstained preparations could not be distinguished with confidence from the viruses isolated from measles. The death of the cells (‘cytopathic changes’) happened in exactly the same manner, whether they inoculated the kidney tissue with the measles snot or not, Cowan says. ‘This is evidence that the destruction of the tissue, the very proof of viral causation of illness, was not caused by anything in the snot because they saw the same destructive effect when the snot was not even used ... the cytopathic, i.e., cell-killing, changes come from the process of the culture itself, not from any virus in any snot, period.’ Enders quotes in his 1957 paper a virologist called Ruckle as reporting similar findings ‘and in addition has isolated an agent from monkey kidney tissue that is so far indistinguishable from human measles virus’. In other words, Cowan says, these particles called ‘measles viruses’ are simply and clearly breakdown products of the starved and poisoned tissue. For measles ‘virus’ see all ‘viruses’ including the so-called ‘Covid virus’. Enders, the ‘Father of Modern Vaccines’, also said: There is a potential risk in employing cultures of primate cells for the production of vaccines composed of attenuated virus, since the presence of other agents possibly latent in primate tissues cannot be definitely excluded by any known method. Cowan further quotes from a paper published in the journal *Viruses* in May, 2020, while the ‘Covid pandemic’ was well underway in the media if not in reality. ‘EVs’ here refers to particles of genetic debris from our own tissues, such as exosomes of which more in a moment: ‘The remarkable resemblance between EVs and viruses has caused quite a few problems in the studies focused on the analysis of EVs released during viral infections.’ Later the paper adds that to date a reliable method that can actually guarantee a complete

separation (of EVs from viruses) DOES NOT EXIST. This was published at a time when a fairy tale 'virus' was claimed in total certainty to be causing a fairy tale 'viral disease' called 'Covid-19' – a fairy tale that was already well on the way to transforming human society in the image that the Cult has worked to achieve for so long. Cowan concludes his article: To summarize, there is no scientific evidence that pathogenic viruses exist. What we think of as 'viruses' are simply the normal breakdown products of dead and dying tissues and cells. When we are well, we make fewer of these particles; when we are starved, poisoned, suffocated by wearing masks, or afraid, we make more. There is no engineered virus circulating and making people sick. People in laboratories all over the world are making genetically modified products to make people sick. These are called vaccines. There is no virome, no 'ecosystem' of viruses, viruses are not 8%, 50% or 100 % of our genetic material. These are all simply erroneous ideas based on the misconception called a virus. What is 'Covid'? Load of bollocks The background described here by Cowan and Lanka was emphasised in the first video presentation that I saw by Dr Andrew Kaufman when he asked whether the 'Covid virus' was in truth a natural defence mechanism of the body called 'exosomes'. These are released by cells when in states of toxicity – see the same themes returning over and over. They are released ever more profusely as chemical and radiation toxicity increases and think of the potential effect therefore of 5G alone as its destructive frequencies infest the human energetic information field with a gathering pace (5G went online in Wuhan in 2019 as the 'virus' emerged). I'll have more about this later. Exosomes transmit a warning to the rest of the body that 'Houston, we have a problem'. Kaufman presented images of exosomes and compared them with 'Covid' under an electron microscope and the similarity was remarkable. They both attach to the same cell receptors (claimed in the case of 'Covid'), contain the same genetic material in the form of RNA or ribonucleic acid, and both are found in 'viral cell cultures' with damaged or dying cells. James Hildreth MD, President and Chief Executive Officer of the Meharry Medical College at Johns Hopkins, said: 'The virus is fully an exosome in every sense of the word.' Kaufman's conclusion was that there is no 'virus': 'This entire pandemic is a completely manufactured

crisis ... there is no evidence of anyone dying from [this] illness.' Dr Tom Cowan and Sally Fallon Morell, authors of *The Contagion Myth*, published a statement with Dr Kaufman in February, 2021, explaining why the 'virus' does not exist and you can read it that in full in the Appendix. 'Virus' theory can be traced to the 'cell theory' in 1858 of German physician Rudolf Virchow (1821-1920) who contended that disease originates from a single cell infiltrated by a 'virus'. Dr Stefan Lanka said that findings and insights with respect to the structure, function and central importance of tissues in the creation of life, which were already known in 1858, comprehensively refute the cell theory. Virchow ignored them. We have seen the part later played by John Enders in the 1950s and Lanka notes that infection theories were only established as a global dogma through the policies and eugenics of the Third Reich in Nazi Germany (creation of the same Sabbatian cult behind the 'Covid' hoax). Lanka said: 'Before 1933, scientists dared to contradict this theory; after 1933, these critical scientists were silenced'. Dr Tom Cowan's view is that ill-health is caused by too much of something, too little of something, or toxification from chemicals and radiation – not contagion. We must also highlight as a major source of the 'virus' theology a man still called the 'Father of Modern Virology' – Thomas Milton Rivers (1888-1962). There is no way given the Cult's long game policy that it was a coincidence for the 'Father of Modern Virology' to be director of the Rockefeller Institute for Medical Research from 1937 to 1956 when he is credited with making the Rockefeller Institute a leader in 'viral research'. Cult Rockefeller were the force behind the creation of Big Pharma 'medicine', established the World Health Organisation in 1948, and have long and close associations with the Gates family that now runs the WHO during the pandemic hoax through mega-rich Cult gofer and psychopath Bill Gates. Only a Renegade Mind can see through all this bullshit by asking the questions that need to be answered, not taking 'no' or prevarication for an answer, and certainly not hiding from the truth in fear of speaking it. Renegade Minds have always changed the world for the better and they will change this one no matter how bleak it may currently appear to be. Sequence of deceit If you tell the truth, you don't have to remember anything against the background that I have laid out



this far the sequence that took us from an invented 'virus' in Cult-owned China in late 2019 to the fascist transformation of human society can be seen and understood in a whole new context. We were told that a deadly disease had broken out in Wuhan and the world media began its campaign (coordinated by behavioural psychologists as we shall see) to terrify the population into unquestioning compliance. We were shown images of Chinese people collapsing in the street which never happened in the West with what was supposed to be the same condition. In the earliest days when alleged cases and deaths were few the fear register was hysterical in many areas of the media and this would expand into the common media narrative across the world. The real story was rather different, but we were never told that. The Chinese government, one of the Cult's biggest centres of global operation, said they had discovered a new illness with flu-like and pneumonia- type symptoms in a city with such toxic air that it is overwhelmed with flu-like symptoms, pneumonia and respiratory disease. Chinese scientists said it was a new – 'novel' – coronavirus which they called Sars-Cov-2 and that it caused a disease they labelled 'Covid-19'. There was no evidence for this and the 'virus' has never to this day been isolated, purified and its genetic code established from that. It was from the beginning a computer-generated fiction. Stories of Chinese whistleblowers saying the number of deaths was being suppressed or that the 'new disease' was related to the Wuhan bio-lab misdirected mainstream and alternative media into cul-de-sacs to obscure the real truth – there was no 'virus'. Chinese scientists took genetic material from the lung fluid of just a few people and said they had found a 'new' disease when this material had a wide range of content. There was no evidence for a 'virus' for the very reasons explained in the last two chapters. The 'virus' has never been shown to (a) exist and (b) cause any disease. People were diagnosed on symptoms that are so widespread in Wuhan and polluted China and with a PCR test that can't detect infectious disease. On this farce the whole global scam was sold to the rest of the world which would also diagnose respiratory disease as 'Covid-19' from symptoms alone or with a PCR test not testing for a 'virus'. Flu miraculously disappeared worldwide in 2020 and into 2021 as it was redesignated 'Covid-19'. It was really the same old flu with its

'flu-like' symptoms attributed to 'flu-like' 'Covid-19'. At the same time with very few exceptions the Chinese response of draconian lockdown and fascism was the chosen weapon to respond across the West as recommended by the Cult-owned Tedros at the Cult-owned World Health Organization run by the Cult-owned Gates. All was going according to plan. Chinese scientists – everything in China is controlled by the Cult-owned government – compared their contaminated RNA lung-fluid material with other RNA sequences and said it appeared to be just under 80 percent identical to the SARS-CoV-1 'virus' claimed to be the cause of the SARS (severe acute respiratory syndrome) 'outbreak' in 2003. They decreed that because of this the 'new virus' had to be related and they called it SARS-CoV-2. There are some serious problems with this assumption and assumption was all it was. Most 'factual' science turns out to be assumptions repeated into everyone-knows-that. A match of under 80-percent is meaningless. Dr Kaufman makes the point that there's a 96 percent genetic correlation between humans and chimpanzees, but 'no one would say our genetic material is part of the chimpanzee family'. Yet the Chinese authorities were claiming that a much lower percentage, less than 80 percent, proved the existence of a new 'coronavirus'. For goodness sake human DNA is 60 percent similar to a banana. You are feeling sleepy The entire 'Covid' hoax is a global Psyop, a psychological operation to program the human mind into believing and fearing a complete fantasy. A crucial aspect of this was what appeared to happen in Italy. It was all very well streaming out daily images of an alleged catastrophe in Wuhan, but to the Western mind it was still on the other side of the world in a very different culture and setting. A reaction of 'this could happen to me and my family' was still nothing like as intense enough for the mind-doctors. The Cult needed a Western example to push people over that edge and it chose Italy, one of its major global locations going back to the Roman Empire. An Italian 'Covid' crisis was manufactured in a particular area called Lombardy which just happens to be notorious for its toxic air and therefore respiratory disease. Wuhan, China, déjà vu. An hysterical media told horror stories of Italians dying from 'Covid' in their droves and how Lombardy hospitals were being overrun by a tidal wave of desperately ill people needing treatment after being struck

down by the 'deadly virus'. Here was the psychological turning point the Cult had planned. Wow, if this is happening in Italy, the Western mind concluded, this indeed could happen to me and my family. Another point is that Italian authorities responded by following the Chinese blueprint so vehemently recommended by the Cult-owned World Health Organization. They imposed fascistic lockdowns on the whole country viciously policed with the help of surveillance drones sweeping through the streets seeking out anyone who escaped from mass house arrest. Livelihoods were destroyed and psychology unravelled in the way we have witnessed since in all lockdown countries. Crucial to the plan was that Italy responded in this way to set the precedent of suspending freedom and imposing fascism in a 'Western liberal democracy'. I emphasised in an animated video explanation on davidicke.com posted in the summer of 2020 how important it was to the Cult to expand the Chinese lockdown model across the West. Without this, and the bare-faced lie that non-symptomatic people could still transmit a 'disease' they didn't have, there was no way locking down the whole population, sick and not sick, could be pulled off. At just the right time and with no evidence Cult operatives and gofers claimed that people without symptoms could pass on the 'disease'. In the name of protecting the 'vulnerable' like elderly people, who lockdowns would kill by the tens of thousands, we had for the first time healthy people told to isolate as well as the sick. The great majority of people who tested positive had no symptoms because there was nothing wrong with them. It was just a trick made possible by a test not testing for the Months after my animated video the Gates-funded Professor Neil Ferguson at the Gates-funded Imperial College confirmed that I was right. He didn't say it in those terms, naturally, but he did say it. Ferguson will enter the story shortly for his outrageously crazy 'computer models' that led to Britain, the United States and many other countries following the Chinese and now Italian methods of response. Put another way, following the Cult script. Ferguson said that SAGE, the UK government's scientific advisory group which has controlled 'Covid' policy from the start, wanted to follow the Chinese lockdown model (while they all continued to work and be paid), but they wondered if they could possibly, in Ferguson's words, 'get away with it in

Europe'. 'Get away with it'? Who the hell do these moronic, arrogant people think they are? This appalling man Ferguson said that once Italy went into national lockdown they realised they, too, could mimic China: It's a communist one-party state, we said. We couldn't get away with it in Europe, we thought ... and then Italy did it. And we realised we could. Behind this garbage from Ferguson is a Ferguson's 'models' would play a central role in achieving that. It's just a coincidence, of course, and absolutely nothing to worry your little head about. Oops, sorry, our mistake

Once the Italian segment of the Psyop had done the job it was designed to do a very different story emerged. Italian authorities revealed that 99 percent of those who had 'died from Covid-19' in Italy had one, two, three, or more 'co-morbidities' or illnesses and health problems that could have ended their life. The US Centers for Disease Control and Prevention (CDC) published a figure of 94 percent for Americans dying of 'Covid' while having other serious medical conditions – on average two to three (some five or six) other potential causes of death. In terms of death from an unproven 'virus' I say it is 100 percent. The other one percent in Italy and six percent in the US would presumably have died from 'Covid's' flu-like symptoms with a range of other possible causes in conjunction with a test not testing for the 'virus'. Fox News reported that even more startling figures had emerged in one US county in which 410 of 422 deaths attributed to 'Covid-19' had other potentially deadly health conditions. The Italian National Health Institute said later that the average age of people dying with a 'Covid-19' diagnosis in Italy was about 81. Ninety percent were over 70 with ten percent over 90. In terms of other reasons to die some 80 percent had two or more chronic diseases with half having three or more including cardiovascular problems, diabetes, respiratory problems and cancer. Why is the phantom 'Covid-19' said to kill overwhelmingly old people and hardly affect the young? Old people continually die of many causes and especially respiratory disease which you can re-diagnose 'Covid-19' while young people die in tiny numbers by comparison and rarely of respiratory disease. Old people 'die of Covid' because they die of other things that can be redesignated 'Covid' and it really is that simple. Flu has flown

The blueprint was in place. Get your illusory 'cases' from a test not testing for the 'virus'

and redesignate other causes of death as 'Covid-19'. You have an instant 'pandemic' from something that is nothing more than a computer-generated fiction. With near-on a billion people having 'flu-like' symptoms every year the potential was limitless and we can see why flu quickly and apparently miraculously disappeared worldwide by being diagnosed 'Covid-19'. The painfully bloody obvious was explained away by the childlike media in headlines like this in the UK 'Independent': 'Not a single case of flu detected by Public Health England this year as Covid restrictions suppress virus'. I kid you not. The masking, social distancing and house arrest that did not make the 'Covid virus' disappear somehow did so with the 'flu virus'. Even worse the article, by a bloke called Samuel Love<sup>^</sup>, suggested that maybe the masking, sanitising and other 'Covid' measures should continue to keep the flu away. With a ridiculousness that disturbs your breathing (it's 'Covid-19') the said Love<sup>^</sup> wrote: 'With widespread social distancing and mask-wearing measures in place throughout the UK, the usual routes of transmission for influenza have been blocked.' He had absolutely no evidence to support that statement, but look at the consequences of him acknowledging the obvious. With flu not disappearing at all and only being relabelled 'Covid-19' he would have to contemplate that 'Covid' was a hoax on a scale that is hard to imagine. You need guts and commitment to truth to even go there and that's clearly something Samuel Love<sup>^</sup> does not have in abundance. He would never have got it through the editors anyway. Tens of thousands die in the United States alone every winter from flu including many with pneumonia complications. CDC figures record 45 million Americans diagnosed with flu in 2017-2018 of which 61,000 died and some reports claim 80,000. Where was the same hysteria then that we have seen with 'Covid-19'? Some 250,000 Americans are adm<sup>i</sup>ed to hospital with pneumonia every year with about 50,000 cases proving fatal. About 65 million suffer respiratory disease every year and three million deaths makes this the third biggest cause of death worldwide. You only have to redesignate a portion of all these people 'Covid-19' and you have an instant global pandemic or the appearance of one. Why would doctors do this? They are told to do this and all but a few dare not refuse those who must be obeyed. Doctors in

general are not researching their own knowledge and instead take it direct and unquestioned from the authorities that own them and their careers. The authorities say they must now diagnose these symptoms 'Covid-19' and not flu, or whatever, and they do it. Dark suits say put 'Covid-19' on death certificates no matter what the cause of death and the doctors do it. Renegade Minds don't fall for the illusion that doctors and medical staff are all highly-intelligent, highly-principled, seekers of medical truth. Some are, but not the majority. They are repeaters, gofers, and yes sir, no sir, purveyors of what the system demands they purvey. The 'Covid' con is not merely confined to diseases of the lungs. Instructions to doctors to put 'Covid-19' on death certificates for anyone dying of anything within 28 days (or much more) of a positive test not testing for the 'virus' opened the floodgates. The term dying with 'Covid' and not of 'Covid' was coined to cover the truth. Whether it was a with or an of they were all added to the death numbers attributed to the 'deadly virus' compiled by national governments and globally by the Gates-funded Johns Hopkins operation in the United States that was so involved in those 'pandemic' simulations. Fraudulent deaths were added to the ever-growing list of fraudulent 'cases' from false positives from a false test. No wonder Professor Walter Ricciardi, scientific advisor to the Italian minister of health, said after the Lombardy hysteria had done its job that 'Covid' death rates were due to Italy having the second oldest population in the world and to how hospitals record deaths: The way in which we code deaths in our country is very generous in the sense that all the people who die in hospitals with the coronavirus are deemed to be dying of the coronavirus. On re-evaluation by the National Institute of Health, only 12 per cent of death certificates have shown a direct causality from coronavirus, while 88 per cent of patients who have died have at least one pre-morbidity – many had two or three. This is extraordinary enough when you consider the propaganda campaign to use Italy to terrify the world, but how can they even say twelve percent were genuine when the 'virus' has not been shown to exist, its 'code' is a computer program, and diagnosis comes from a test not testing for it? As in China, and soon the world, 'Covid-19' in Italy was a redesignation of diagnosis. Lies and corruption were to become the

real 'pandemic' fuelled by a pathetically-compliant medical system taking its orders from the tiny few at the top of their national hierarchy who answered to the World Health Organization which answers to Gates and the Cult. Doctors were told – ordered – to diagnose a particular set of symptoms 'Covid-19' and put that on the death certificate for any cause of death if the patient had tested positive with a test not testing for the virus or had 'Covid' symptoms like the flu. The United States even introduced big financial incentives to manipulate the figures with hospitals receiving £4,600 from the Medicare system for diagnosing someone with regular pneumonia, \$13,000 if they made the diagnosis from the same symptoms 'Covid-19' pneumonia, and \$39, 000 if they put a 'Covid' diagnosed patient on a ventilator that would almost certainly kill them. A few – painfully and pathetically few – medical whistleblowers revealed (before Cult-owned YouTube deleted their videos) that they had been instructed to 'let the patient crash' and put them straight on a ventilator instead of going through a series of far less intrusive and dangerous methods as they would have done before the pandemic hoax began and the financial incentives kicked in. We are talking cold-blooded murder given that ventilators are so damaging to respiratory systems they are usually the last step before heaven awaits. Renegade Minds never fall for the belief that people in white coats are all angels of mercy and cannot be full-on psychopaths. I have explained in detail in The Answer how what I am describing here played out across the world coordinated by the World Health Organization through the medical hierarchies in almost every country. Medical scientist calls it Information about the non-existence of the 'virus' began to emerge for me in late March, 2020, and mushroomed after that. I was sent an email by Sir Julian Rose, a writer, researcher, and organic farming promotor, from a medical scientist friend of his in the United States. Even at that early stage in March the scientist was able to explain how the 'Covid' hoax was being manipulated. He said there were no reliable tests for a specific 'Covid-19 virus' and nor were there any reliable agencies or media outlets for reporting numbers of actual 'Covid-19' cases. We have seen in the long period since then that he was absolutely right. 'Every action and reaction to Covid-19 is based on totally flawed data and we simply cannot make accurate

assessments,' he said. Most people diagnosed with 'Covid-19' were showing nothing more than cold and flu-like symptoms 'because most coronavirus strains are nothing more than cold/flu-like symptoms'. We had farcical situations like an 84-year-old German man testing positive for 'Covid-19' and his nursing home ordered to quarantine only for him to be found to have a common cold. The scientist described back then why PCR tests and what he called the 'Mickey Mouse test kits' were useless for what they were claimed to be identifying. 'The idea these kits can isolate a specific virus like Covid-19 is nonsense,' he said. Significantly, he pointed out that 'if you want to create a totally false panic about a totally false pandemic – pick a coronavirus'. This is exactly what the Cult-owned Gates, World Economic Forum and Johns Hopkins University did with their Event 201 'simulation' followed by their real-life simulation called the 'pandemic'. The scientist said that all you had to do was select the sickest of people with respiratory-type diseases in a single location – 'say Wuhan' – and administer PCR tests to them. You can then claim that anyone showing 'viral sequences' similar to a coronavirus 'which will inevitably be quite a few' is suffering from a Since you already selected the sickest flu cases a fairly high proportion of your sample will go on to die. You can then say this 'new' virus has a CFR [case fatality rate] higher than the flu and use this to infuse more concern and do more tests which will of course produce more 'cases', which expands the testing, which produces yet more 'cases' and so on and so on. Before long you have your 'pandemic', and all you have done is use a simple test kit trick to convert the worst flu and pneumonia cases into something new that doesn't ACTUALLY EXIST He said that you then 'just run the same scam in other countries' and make sure to keep the fear message running high 'so that people will feel panicky and less able to think critically'. The only problem to overcome was the fact there is no actual new deadly pathogen and only regular sick people. This meant that deaths from the 'new deadly pathogen' were going to be way too low for a real new deadly virus pandemic, but he said this could be overcome in the following ways – all of which would go on to happen: 1. You can claim this is just the beginning and more deaths are imminent [you underpin this with fantasy 'computer projections']. Use this as an excuse to quarantine everyone and then claim



the quarantine prevented the expected millions of dead. 2. You can [say that people] 'minimizing' the dangers are irresponsible and bully them into not talking about numbers. 3. You can talk crap about made up numbers hoping to blind people with pseudoscience. 4. You can start testing well people (who, of course, will also likely have shreds of coronavirus [RNA] in them) and thus inflate your 'case figures' with 'asymptomatic carriers' (you will of course have to spin that to sound deadly even though any virologist knows the more symptom-less cases you have the less deadly is your pathogen). The scientist said that if you take these simple steps 'you can have your own entirely manufactured pandemic up and running in weeks'. His analysis made so early in the hoax was brilliantly prophetic of what would actually unfold. Pulling all the information together in these recent chapters we have this is simple 1, 2, 3, of how you can delude virtually the entire human population into believing in a 'virus' that doesn't exist: A 'Covid case' is someone who tests positive with a test not testing for the 'virus'. A 'Covid death' is someone who dies of any cause within 28 days (or much longer) of testing positive with a test not testing for the Asymptomatic means there is nothing wrong with you, but they claim you can pass on what you don't have to justify locking down (quarantining) healthy people in totality. The foundations of the hoax are that simple. A study involving ten million people in Wuhan, published in November, 2020, demolished the whole lie about those without symptoms passing on the 'virus'. They found '300 asymptomatic cases' and traced their contacts to find that not one of them was detected with the 'virus'. 'Asymptomatic' patients and their contacts were isolated for no less than two weeks and nothing changed. I know it's all crap, but if you are going to claim that those without symptoms can transmit 'the virus' then you must produce evidence for that and they never have. Even World Health Organization official Dr Maria Van Kerkhove, head of the emerging diseases and zoonosis unit, said as early as June, 2020, that she doubted the validity of asymptomatic transmission. She said that 'from the data we have, it still seems to be rare that an asymptomatic person actually transmits onward to a secondary individual' and by 'rare' she meant that she couldn't cite any case of asymptomatic transmission. The Ferguson factor The problem for the Cult as it headed

into March, 2020, when the script had lockdown due to start, was that despite all the manipulation of the case and death figures they still did not have enough people alleged to have died from 'Covid' to justify mass house arrest. This was overcome in the way the scientist described: 'You can claim this is just the beginning and more deaths are imminent ... Use this as an excuse to quarantine everyone and then claim the quarantine prevented the expected millions of dead.' Enter one Professor Neil Ferguson, the Gates-funded 'epidemiologist' at the Gates-funded Imperial College in London. Ferguson is Britain's Christian Drosten in that he has a dire record of predicting health outcomes, but is still called upon to advise government on the next health outcome when another 'crisis' comes along. This may seem to be a strange and ridiculous thing to do. Why would you keep turning for policy guidance to people who have a history of being monumentally wrong? Ah, but it makes sense from the Cult point of view. These 'experts' keep on producing predictions that suit the Cult agenda for societal transformation and so it was with Neil Ferguson as he revealed his horrific (and clearly insane) computer model predictions that allowed lockdowns to be imposed in Britain, the United States and many other countries. Ferguson does not have even an A-level in biology and would appear to have no formal training in computer modelling, medicine or epidemiology, according to Derek Winton, an MSc in Computational Intelligence. He wrote an article somewhat aghast at what Ferguson did which included taking no account of respiratory disease 'seasonality' which means it is far worse in the winter months. Who would have thought that respiratory disease could be worse in the winter? Well, certainly The massively China-connected Imperial College and its bizarre professor provided the excuse for the long-incubated Chinese model of human control to travel westward at lightning speed. Imperial College confirms on its website that it collaborates with the Chinese Research Institute; publishes more than 600 research papers every year with Chinese research institutions; has 225 Chinese staff; 2,600 Chinese students – the biggest international group; 7,000 former students living in China which is the largest group outside the UK; and was selected for a tour by China's President Xi Jinping during his state visit to the UK in 2015. The

college takes major donations from China and describes itself as the UK's number one university collaborator with Chinese research institutions. The China communist/fascist government did not appear phased by the woeful predictions of Ferguson and Imperial when during the lockdown that Ferguson induced the college signed a five-year collaboration deal with China tech giant Huawei that will have Huawei's indoor 5G network equipment installed at the college's West London tech campus along with an 'AI cloud platform'. The deal includes Chinese sponsorship of Imperial's Venture Catalyst entrepreneurship competition. Imperial is an example of the enormous influence the Chinese government has within British and North American universities and research centres – and further afield. Up to 200 academics from more than a dozen UK universities are being investigated on suspicion of 'unintentionally' helping the Chinese government build weapons of mass destruction by 'transferring world-leading research in advanced military technology such as aircraft, missile designs and cyberweapons'. Similar scandals have broken in the United States, but it's all a coincidence. Imperial College serves the agenda in many other ways including the promotion of every aspect of the United Nations Agenda 21/2030 (the Great Reset) and produced computer models to show that human-caused 'climate change' is happening when in the real world it isn't. Imperial College is driving the climate agenda as it drives the 'Covid' agenda (both Cult hoaxes) while Patrick Vallance, the UK government's Chief Scientific Adviser on 'Covid', was named Chief Scientific Adviser to the UN 'climate change' conference known as COP26 hosted by the government in Glasgow, Scotland. 'Covid' and 'climate' are fundamentally connected. From Imperial's bosom came Neil Ferguson still advising government despite his previous disasters and it was announced early on that he and other key people like UK Chief Medical Adviser Chris Whitty had caught the 'virus' as the propaganda story was being sold. Somehow they managed to survive and we had Prime Minister Boris Johnson admitted to hospital with what was said to be a severe version of the 'virus' in this same period. His whole policy and demeanour changed when he returned to Downing Street. It's a small world with these government advisors – especially in their communal connections to Gates – and Ferguson had

partnered with Whitty to write a paper called 'Infectious disease: Tough choices to reduce Ebola transmission' which involved another scare-story that didn't happen. Ferguson's 'models' predicted that up to 150,000 could die from 'mad cow disease', or BSE, and its version in sheep if it was transmitted to humans. BSE was not transmitted and instead triggered by an organophosphate pesticide used to treat a pest on cows. Fewer than 200 deaths followed from the human form. Models by Ferguson and his fellow incompetents led to the unnecessary culling of millions of pigs, cattle and sheep in the foot and mouth outbreak in 2001 which destroyed the lives and livelihoods of farmers and their families who had often spent decades building their herds and flocks. Vast numbers of these animals did not have foot and mouth and had no contact with the infection. Another 'expert' behind the cull was Professor Roy Anderson, a computer modeller at Imperial College specialising in the epidemiology of human, not animal, disease. Anderson has served on the Bill and Melinda Gates Grand Challenges in Global Health advisory board and chairs another Gates-funded organisation. Gates is everywhere. In a precursor to the 'Covid' script Ferguson backed closing schools 'for prolonged periods' over the swine flu 'pandemic' in 2009 and said it would affect a third of the world population if it continued to spread at the speed he claimed to be happening. His mates at Imperial College said much the same and a news report said: 'One of the authors, the epidemiologist and disease modeller Neil Ferguson, who sits on the World Health Organisation's emergency committee for the outbreak, said the virus had "full pandemic potential".' Professor Liam Donaldson, the Chris Whitty of his day as Chief Medical Officer, said the worst case could see 30 percent of the British people infected by swine flu with 65,000 dying. Ferguson and Donaldson were indeed proved correct when at the end of the year the number of deaths attributed to swine flu was 392. The term 'expert' is rather liberally applied unfortunately, not least to complete idiots. Swine flu 'projections' were great for GlaxoSmithKline (GSK) as millions rolled in for its Pandemrix influenza vaccine which led to brain damage with children most affected. The British government (taxpayers) paid out more than £60 million in compensation after GSK was given immunity from prosecution. Yet

another 'Covid' déjà vu. Swine flu was supposed to have broken out in Mexico, but Dr Wolfgang Wodarg, a German doctor, former member of parliament and critic of the 'Covid' hoax, observed 'the spread of swine flu' in Mexico City at the time. He said: 'What we experienced in Mexico City was a very mild flu which did not kill more than usual – which killed even fewer people than usual.' Hyping the fear against all the facts is not unique to 'Covid' and has happened many times before. Ferguson is reported to have over-estimated the projected death toll of bird flu (H5N1) by some three million-fold, but bird flu vaccine makers again made a killing from the scare. This is some of the background to the Neil Ferguson who produced the perfectly-timed computer models in early 2020 predicting that half a million people would die in Britain without draconian lockdown and 2.2 million in the United States. Politicians panicked, people panicked, and lockdowns of alleged short duration were instigated to 'flaßen the curve' of cases gleaned from a test not testing for the 'virus'. I said at the time that the public could forget the 'short duration' bit. This was an agenda to destroy the livelihoods of the population and force them into mass control through dependency and there was going to be nothing 'short' about it. American researcher Daniel Horowitz described the consequences of the 'models' spewed out by Gates-funded Ferguson and Imperial. What led our government and the governments of many other countries into panic was a single Imperial College of UK study, funded by global warming activists, that predicted 2.2 million deaths if we didn't lock down the country. In addition, the reported 8-9% death rate in Italy scared us into thinking there was some other mutation of this virus that they got, which might have come here. Together with the fact that we were finally testing and had the ability to actually report new cases, we thought we were headed for a death spiral. But again ... we can't flatten a curve if we don't know when the curve started. How about it never started? Giving them what they want. An investigation by German news outlet Welt Am Sonntag (World on Sunday) revealed how in March, 2020, the German government gathered together 'leading scientists from several research institutes and universities' and 'together, they were to produce a [modelling] paper that would serve as legitimization for further tough political

measures'. The Cult agenda was justified by computer modelling not based on evidence or reality; it was specifically constructed to justify the Cult demand for lockdowns all over the world to destroy the independent livelihoods of the global population. All these modellers and everyone responsible for the 'Covid' hoax have a date with a trial like those in Nuremberg after World War Two when Nazis faced the consequences of their war crimes. These corrupt-beyond-belief 'modellers' wrote the paper according to government instructions and it said that if lockdown measures were lifted then up to one million Germans would die from 'Covid-19' adding that some would die 'agonizingly at home, gasping for breath' unable to be treated by hospitals that couldn't cope. All lies. No matter – it gave the Cult all that it wanted. What did long-time government 'modeller' Neil Ferguson say? If the UK and the United States didn't lockdown half a million would die in Britain and 2.2 million Americans. Anyone see a theme here? 'Modellers' are such a crucial part of the lockdown strategy that we should look into their background and follow the money. Researcher Rosemary Frei produced an excellent article headlined 'The Modelling-paper Mafiosi'. She highlights a guy called John Edmunds, a British epidemiologist, and professor in the Faculty of Epidemiology and Population Health at the London School of Hygiene & Tropical Medicine. He studied at Imperial College. Edmunds is a member of government 'Covid' advisory bodies which have been dictating policy, the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) and the Scientific Advisory Group for Ferguson, another member of NERVTAG and SAGE, led the way with the original 'virus' and Edmunds has followed in the 'variant' stage and especially the so-called UK or Kent variant known as the 'Variant of Concern' (VOC) B.1.1.7. He said in a co-written report for the Centre for Mathematical modelling of Infectious Diseases at the London School of Hygiene and Tropical Medicine, with input from the Centre's 'Covid-19' Working Group, that there was 'a realistic possibility that VOC B.1.1.7 is associated with an increased risk of death compared to non-VOC viruses'. Fear, fear, fear, get the vaccine, fear, fear, fear, get the vaccine. Rosemary Frei reveals that almost all the paper's authors and members of the modelling centre's 'Covid-19' Working Group receive funding from the Bill and Melinda Gates Foundation and/or

the associated Gates-funded Wellcome Trust. The paper was published by e-journal MedRxiv which only publishes papers not peer-reviewed and the journal was established by an organisation headed by Facebook's Mark Zuckerberg and his missus. What a small world it is. Frei discovered that Edmunds is on the Scientific Advisory Board of the Coalition for Epidemic Preparedness Innovations (CEPI) which was established by the Bill and Melinda Gates Foundation, Klaus Schwab's Davos World Economic Forum and Big Pharma giant Wellcome. CEPI was 'launched in Davos [in 2017] to develop vaccines to stop future epidemics', according to its website. 'Our mission is to accelerate the development of vaccines against emerging infectious diseases and enable equitable access to these vaccines for people during outbreaks.' What kind people they are. Rosemary Frei reveals that Public Health England (PHE) director Susan Hopkins is an author of her organisation's non-peer-reviewed reports on 'new variants'. Hopkins is a professor of infectious diseases at London's Imperial College which is gifted tens of millions of dollars a year by the Bill and Melinda Gates Foundation. Gates-funded modelling disaster Neil Ferguson also co-authors Public Health England reports and he spoke in December, 2020, about the potential danger of the B.1.1.7. 'UK variant' promoted by Gates-funded modeller John Edmunds. When I come to the 'Covid vaccines' the 'new variants' will be shown for what they are – bollocks. All these people and modellers are lockdown-obsessed or, put another way, they demand what the Cult demands. Edmunds said in January, 2021, that to ease lockdowns too soon would be a disaster and they had to 'vaccinate much, much, much more widely than the elderly'. Rosemary Frei highlights that Edmunds is married to Jeanne Pimenta who is described in a LinkedIn profile as director of epidemiology at GlaxoSmithKline (GSK) and she held shares in the company. Patrick Vallance, co-chair of SAGE and the government's Chief Scientific Adviser, is a former executive of GSK and has a deferred bonus of shares in the company worth £600,000. GSK has serious business connections with Bill Gates and is collaborating with mRNA-'vaccine' company CureVac to make 'vaccines' for the new variants that Edmunds is talking about. GSK is planning a 'Covid vaccine' with drug giant Sanofi. Puppet Prime Minister Boris Johnson announced in the spring

of 2021 that up to 60 million vaccine doses were to be made at the GSK facility at Barnard Castle in the English North East. Barnard Castle, with a population of just 6,000, was famously visited in breach of lockdown rules in April, 2020, by Johnson aide Dominic Cummings who said that he drove there 'to test his eyesight' before driving back to London. Cummings would be better advised to test his integrity – not that it would take long. The GSK facility had nothing to do with his visit then although I'm sure Patrick Vallance would have been happy to arrange an introduction and some tea and biscuits. Ruthless psychopath Gates has made yet another fortune from vaccines in collaboration with Big Pharma companies and gushes at the phenomenal profits to be made from vaccines – more than a 20-to-1 return as he told one interviewer. Gates also tweeted in December, 2019, with the foreknowledge of what was coming: 'What's next for our foundation? I'm particularly excited about what the next year could mean for one of the best buys in global health: vaccines.' Modeller John Edmunds is a big promotor of vaccines as all these people appear to be. He's the dean of the London School of Hygiene & Tropical Medicine's Faculty of Epidemiology and Population Health which is primarily funded by the Bill and Melinda Gates Foundation and the Gates-established and funded GAVI vaccine alliance which is the Gates vehicle to vaccinate the world. The organisation Doctors Without Borders has described GAVI as being 'aimed more at supporting drug-industry desires to promote new products than at finding the most efficient and sustainable means for fighting the diseases of poverty'. But then that's why the psychopath Gates created it. John Edmunds said in a video that the London School of Hygiene & Tropical Medicine is involved in every aspect of vaccine development including large-scale clinical trials. He contends that mathematical modelling can show that vaccines protect individuals and society. That's on the basis of shit in and shit out, I take it. Edmunds serves on the UK Vaccine Network as does Ferguson and the government's foremost 'Covid' adviser, the grim-faced, dark-eyed Chris Whitty. The Vaccine Network says it works 'to support the government to identify and shortlist targeted investment opportunities for the most promising vaccines and vaccine technologies that will help combat infectious diseases with epidemic potential, and to



address structural issues related to the UK's broader vaccine infrastructure'. Ferguson is acting Director of the Imperial College Vaccine Impact Modelling Consortium which has funding from the Bill and Melina Gates Foundation and the Gates-created GAVI 'vaccine alliance'. Anyone wonder why these characters see vaccines as the answer to every problem? Ferguson is wildly enthusiastic in his support for GAVI's campaign to vaccinate children en masse in poor countries. You would expect someone like Gates who has constantly talked about the need to reduce the population to want to fund vaccines to keep more people alive. I'm sure that's why he does it. The John Edmunds London School of Hygiene & Tropical Medicine (LSHTM) has a Vaccines Manufacturing Innovation Centre which develops, tests and commercialises vaccines. Rosemary Frei writes: The vaccines centre also performs affiliated activities like combating 'vaccine hesitancy'. The latter includes the Vaccine Confidence Project. The project's stated purpose is, among other things, 'to provide analysis and guidance for early response and engagement with the public to ensure sustained confidence in vaccines and immunisation'. The Vaccine Confidence Project's director is LSHTM professor Heidi Larson. For more than a decade she's been researching how to combat vaccine hesitancy. How the bloody hell can blokes like John Edmunds and Neil Ferguson with those connections and financial ties model 'virus' case and death projections for the government and especially in a way that gives their paymasters like Gates exactly what they want? It's insane, but this is what you find throughout the world. 'Covid' is not dangerous, oops, wait, yes it is Only days before Ferguson's nightmare scenario made Jackboot Johnson take Britain into a China-style lockdown to save us from a deadly 'virus' the UK government website gov.uk was reporting something very different to Ferguson on a page of official government guidance for 'high consequence infectious diseases (HCID)'. It said this about 'Covid-19': As of 19 March 2020, COVID-19 is no longer considered to be a high consequence infectious diseases (HCID) in the UK [my emphasis]. The 4 nations public health HCID group made an interim recommendation in January 2020 to classify COVID-19 as an HCID. This was based on consideration of the UK HCID criteria about the virus and the disease with information available during the early stages of the outbreak. Now that

more is known about COVID-19, the public health bodies in the UK have reviewed the most up to date information about COVID-19 against the UK HCID criteria. They have determined that several features have now changed; in particular, more information is available about mortality rates (low overall), and there is now greater clinical awareness and a specific and sensitive laboratory test, the availability of which continues to increase. The Advisory Committee on Dangerous Pathogens (ACDP) is also of the opinion that COVID-19 should no longer be classified as an HCID. Soon after the government had been exposed for downgrading the risk they upgraded it again and everyone was back to singing from the same Cult hymn book. Ferguson and his fellow Gates clones indicated that lockdowns and restrictions would have to continue until a Gates-funded vaccine was developed. Gates said the same because Ferguson and his like were repeating the Gates script which is the Cult script. 'Flatten the curve' became an ongoing nightmare of continuing lockdowns with periods in between of severe restrictions in pursuit of destroying independent incomes and had nothing to do with protecting health about which the Cult gives not a shit. Why wouldn't Ferguson be pushing a vaccine 'solution' when he's owned by vaccine-obsessive Gates who makes a fortune from them and when Ferguson heads the Vaccine Impact Modelling Consortium at Imperial College funded by the Gates Foundation and GAVI, the 'vaccine alliance', created by Gates as his personal vaccine promotion operation? To compound the human catastrophe that Ferguson's 'models' did so much to create he was later exposed for breaking his own lockdown rules by having sexual liaisons with his married girlfriend Antonia Staats at his home while she was living at another location with her husband and children. Staats was a 'climate' activist and senior campaigner at the Soros-funded Avaaz which I wouldn't trust to tell me that grass is green. Ferguson had to resign as a government advisor over this hypocrisy in May, 2020, but after a period of quiet he was back being quoted by the ridiculous media on the need for more lockdowns and a vaccine rollout. Other government-advising 'scientists' from Imperial College held the fort in his absence and said lockdown could be indefinite until a vaccine was found. The Cult script was being sung by the

payrolled choir. I said there was no intention of going back to 'normal' when the 'vaccine' came because the 'vaccine' is part of a very different agenda that I will discuss in Human 2.0. Why would the Cult want to let the world go back to normal when destroying that normal forever was the whole point of what was happening? House arrest, closing businesses and schools through lockdown, (un)social distancing and masks all followed the Ferguson fantasy models. Again as I predicted (these people are so predictable) when the 'vaccine' arrived we were told that house arrest, lockdown, (un)social distancing and masks would still have to continue. I will deal with the masks in the next chapter because they are of fundamental importance. Where's the 'pandemic'? Any mildly in-depth assessment of the figures revealed what was really going on. Cult-funded and controlled organisations still have genuine people working within them such as the number involved. So it is with Genevieve Briand, assistant program director of the Applied Economics master's degree program at Johns Hopkins University. She analysed the impact that 'Covid-19' had on deaths from all causes in the United States using official data from the CDC for the period from early February to early September, 2020. She found that allegedly 'Covid' related-deaths exceeded those from heart disease which she found strange with heart disease always the biggest cause of fatalities. Her research became even more significant when she noted the sudden decline in 2020 of all non-'Covid' deaths: 'This trend is completely contrary to the pattern observed in all previous years ... the total decrease in deaths by other causes almost exactly equals the increase in deaths by Covid-19.' This was such a game, set and match in terms of what was happening that Johns Hopkins University deleted the article on the grounds that it 'was being used to support false and dangerous inaccuracies about the impact of the pandemic'. No – because it exposed the scam from official CDC figures and this was confirmed when those figures were published in January, 2021. Here we can see the effect of people dying from heart attacks, cancer, road accidents and gunshot wounds – anything – having 'Covid-19' on the death certificate along with those diagnosed from 'symptoms' who had even not tested positive with a test not testing for the 'virus'. I am not kidding with the gunshot wounds, by the way. Brenda Bock, coroner in Grand County,

Colorado, revealed that two gunshot victims tested positive for the 'virus' within the previous 30 days and were therefore classified as 'Covid deaths'. Bock said: 'These two people had tested positive for Covid, but that's not what killed them. A gunshot wound is what killed them.' She said she had not even finished her investigation when the state listed the gunshot victims as deaths due to the 'virus'. The death and case figures for 'Covid-19' are an absolute joke and yet they are repeated like parrots by the media, politicians and alleged medical 'experts'. The official Cult narrative is the only show in town. Genevieve Briand found that deaths from all causes were not exceptional in 2020 compared with previous years and a Spanish magazine published figures that said the same about Spain which was a 'Covid' propaganda hotspot at one point. Discovery Salud, a health and medicine magazine, quoted government figures which showed how 17,000 fewer people died in Spain in 2020 than in 2019 and more than 26,000 fewer than in 2018. The age-standardised mortality rate for England and Wales when age distribution is taken into account was significantly lower in 2020 than the 1970s, 80s and 90s, and was only the ninth highest since 2000. Where is the Post mortems and autopsies virtually disappeared for 'Covid' deaths amid claims that 'virus-infected' bodily fluids posed a risk to those carrying out the autopsy. This was rejected by renowned German pathologist and forensic doctor Klaus Püschel who said that he and his staff had by then done 150 autopsies on 'Covid' patients with no problems at all. He said they were needed to know why some 'Covid' patients suffered blood clots and not severe respiratory infections. The 'virus' is, after all, called SARS or 'severe acute respiratory syndrome'. I highlighted in the spring of 2020 this phenomenon and quoted New York intensive care doctor Cameron Kyle-Sidell who posted a soon deleted YouTube video to say that they had been told to prepare to treat an infectious disease called 'Covid-19', but that was not what they were dealing with. Instead he likened the lung condition of the most severely ill patients to what you would expect with cabin depressurisation in a plane at 30,000 feet or someone dropped on the top of Everest without oxygen or acclimatisation. I have never said this is not happening to a small minority of alleged 'Covid' patients – I am saying this is not

caused by a phantom 'contagious virus'. Indeed Kyle-Sidell said that 'Covid-19' was not the disease they were told was coming their way. 'We are operating under a medical paradigm that is untrue,' he said, and he believed they were treating the wrong disease: 'These people are being slowly starved of oxygen.' Patients would take off their oxygen masks in a state of fear and stress and while they were blue in the face on the brink of death. They did not look like patients dying of pneumonia. You can see why they don't want autopsies when their virus doesn't exist and there is another condition in some people that they don't wish to be uncovered. I should add here that the 5G system of millimetre waves was being rapidly introduced around the world in 2020 and even more so now as they fire 5G at the Earth from satellites. At 60 gigahertz within the 5G range that frequency interacts with the oxygen molecule and stops people breathing in sufficient oxygen to be absorbed into the bloodstream. They are installing 5G in schools and hospitals. The world is not mad or anything. 5G can cause major changes to the lungs and blood as I detail in The Answer and these consequences are labelled 'Covid- 19', the alleged symptoms of which can be caused by 5G and other electromagnetic frequencies as cells respond to radiation poisoning. The 'Covid death' scam Dr Scoï Jensen, a Minnesota state senator and medical doctor, exposed 'Covid' Medicare payment incentives to hospitals and death certificate manipulation. He said he was sent a seven-page document by the US Department of Health 'coaching' him on how to fill out death certificates which had never happened before. The document said that he didn't need to have a laboratory test for 'Covid-19' to put that on the death certificate and that shocked him when death certificates are supposed to be about facts. Jensen described how doctors had been 'encouraged, if not pressured' to make a diagnosis of 'Covid-19' if they thought it was probable or 'presumed'. No positive test was necessary – not that this would have mattered anyway. He said doctors were told to diagnose 'Covid' by symptoms when these were the same as colds, allergies, other respiratory problems, and certainly with influenza which 'disappeared' in the 'Covid' era. A common sniffle was enough to get the dreaded verdict. Ontario authorities decreed that a single care home resident with one symptom from a long

list must lead to the isolation of the entire home. Other courageous doctors like Jensen made the same point about death figure manipulation and how deaths by other causes were falling while 'Covid-19 deaths' were rising at the same rate due to re-diagnosis. Their videos rarely survive long on YouTube with its Cult-supporting algorithms courtesy of CEO Susan Wojcicki and her bosses at Google. Figure-tampering was so glaring and ubiquitous that even officials were letting it slip or outright saying it. UK chief scientific adviser Patrick Vallance said on one occasion that 'Covid' on the death certificate doesn't mean 'Covid' was the cause of death (so why the hell is it there?) and we had the rare sight of a BBC reporter telling the truth when she said: 'Someone could be successfully treated for Covid, in say April, discharged, and then in June, get run over by a bus and die ... That person would still be counted as a Covid death in England.' Yet the BBC and the rest of the world media went on repeating the case and death figures as if they were real. Illinois Public Health Director Dr Ngozi Ezike revealed the deceit while her bosses must have been clenching their buttocks: If you were in a hospice and given a few weeks to live and you were then found to have Covid that would be counted as a Covid death. [There might be] a clear alternate cause, but it is still listed as a Covid death. So everyone listed as a Covid death doesn't mean that was the cause of the death, but that they had Covid at the time of death. Yes, a 'Covid virus' never shown to exist and tested for with a test not testing for the 'virus'. In the first period of the pandemic hoax through the spring of 2020 the process began of designating almost everything a 'Covid' death and this has continued ever since. I sat in a restaurant one night listening to a loud conversation on the next table where a family was discussing in bewilderment how a relative who had no symptoms of 'Covid', and had died of a long-term problem, could have been diagnosed a death by the 'virus'. I could understand their bewilderment. If they read this book they will know why this medical fraud has been perpetrated the world over. Some media truth shock

The media ignored the evidence of death certificate fraud until eventually one columnist did speak out when she saw it first-hand. Bel Mooney is a long-time national newspaper journalist in Britain currently working for the Daily Mail. Her article on February 19th, 2021, carried this

headline: 'My dad Ted passed three Covid tests and died of a chronic illness yet he's officially one of Britain's 120,000 victims of the virus and is far from alone ... so how many more are there?' She told how her 99-year-old father was in a care home with a long-standing chronic obstructive pulmonary disease and vascular dementia. Maybe, but he was still aware enough to tell her from the start that there was no 'virus' and he refused the 'vaccine' for that reason. His death was not unexpected given his chronic health problems and Mooney said she was shocked to find that 'Covid-19' was declared the cause of death on his death certificate. She said this was a 'bizarre and unacceptable untruth' for a man with long-time health problems who had tested negative twice at the home for the 'virus'. I was also shocked by this story although not by what she said. I had been highlighting the death certificate manipulation for ten months. It was the confirmation that a professional full-time journalist only realised this was going on when it affected her directly and neither did she know that whether her dad tested positive or negative was irrelevant with the test not testing for the 'virus'. Where had she been? She said she did not believe in 'conspiracy theories' without knowing I'm sure that this and 'conspiracy theorists' were terms put into widespread circulation by the CIA in the 1960s to discredit those who did not accept the ridiculous official story of the Kennedy assassination. A blanket statement of 'I don't believe in conspiracy theories' is always bizarre. The dictionary definition of the term alone means the world is drowning in conspiracies. What she said was even more daft when her dad had just been affected by the 'Covid' conspiracy. Why else does she think that 'Covid-19' was going on the death certificates of people who died of something else? To be fair once she saw from personal experience what was happening she didn't mince words. Mooney was called by the care home on the morning of February 9th to be told her father had died in his sleep. When she asked for the official cause of death what came back was 'Covid-19'. Mooney challenged this and was told there had been deaths from Covid on the dementia floor (confirmed by a test not testing for the 'virus') so they considered it 'reasonable to assume'. 'But doctor,' Mooney rightly protested, 'an assumption isn't a diagnosis.' She said she didn't blame the perfectly decent and death on the death certificate

and that is a criminal offence for which he should be brought to account and the same with the millions of their job they were following orders and that must not wash at new Nuremberg trials any more than it did at the first ones. Mooney's doctor was 'assuming' (presuming) as he was told to, but 'just following orders' makes no difference to his actions. A doctor's job is to serve the patient and the truth, not follow orders, but that's what they have done all over the world and played a central part in making the 'Covid' hoax possible with all its catastrophic consequences for humanity. Shame on them and they must answer for their actions. Mooney said her disquiet worsened when she registered her father's death by telephone and was told by the registrar there had been very many other cases like hers where 'the deceased' had not tested positive for 'Covid' yet it was recorded as the cause of death. The test may not matter, but those involved at their level think it matters and it shows a callous disregard for accurate diagnosis. The pressure to do this is coming from the top of the national 'health' pyramids which in turn obey the World Health Organization which obeys Gates and the Cult. Mooney said the registrar agreed that this must distort the national figures adding that 'the strangest thing is that every winter we record countless deaths from flu, and this winter there have been none. Not one!' She asked if the registrar thought deaths from flu were being misdiagnosed and lumped together with 'Covid' deaths. The answer was a 'puzzled yes'. Mooney said that the funeral director said the same about 'Covid' deaths which had nothing to do with 'Covid'. They had lost count of the number of families upset by this and other funeral companies in different countries have had the same experience. Mooney wrote: The nightly shroud-waving and shocking close-ups of pain imposed on us by the TV news bewildered and terrified the population into eager compliance with lockdowns. We were invited to 'save the NHS' and to grieve for strangers – the real-life loved ones behind those shocking death counts. Why would the public imagine what I now fear, namely that the way Covid-19 death statistics are compiled might make the numbers seem greater than they are? Oh, just a little bit – like 100 percent. Do the maths Mooney asked why a country would wish to skew its mortality figures by wrongly certifying deaths? What had been going on? Well, if you don't believe in



conspiracies you will never find the answer which is that it's a conspiracy. She did, however, describe what she had discovered as a 'national scandal'. In reality it's a global scandal and happening everywhere. Pillars of this conspiracy were all put into place before the bujôn was pressed with the Drosten PCR protocol and high amplifications to produce the cases and death certificate changes to secure illusory 'Covid' deaths. Mooney notes that normally two doctors were needed to certify a death, with one having to know the patient, and how the rules were changed in the spring of 2020 to allow one doctor to do this. In the same period 'Covid deaths' were decreed to be all cases where Covid-19 was put on the death certificate even without a positive test or any symptoms. Mooney asked: 'How many of the 30,851 (as of January 15) care home resident deaths with Covid-19 on the certificate (32.4 per cent of all deaths so far) were based on an assumption, like that of my father? And what has that done to our national psyche?' All of them is the answer to the first question and it has devastated and dismantled the national psyche, actually the global psyche, on a colossal scale. In the UK case and death data is compiled by organisations like Public Health England (PHE) and the Office for National Statistics (ONS). Mooney highlights the insane policy of counting a death from any cause as 'Covid-19' if this happens within 28 days of a positive test (with a test not testing for the 'virus') and she points out that ONS statistics reflect deaths 'involving Covid' 'or due to Covid' which meant in practice any death where 'Covid-19' was mentioned on the death certificate. She described the consequences of this fraud: Most people will accept the narrative they are fed, so panicky governments here and in Europe witnessed the harsh measures enacted in totalitarian China and jumped into lockdown. Headlines about Covid deaths tolled like the knell that would bring doomsday to us all. Fear stalked our empty streets. Politicians parroted the frankly ridiculous aim of 'zero Covid' and shut down the economy, while most British people agreed that lockdown was essential and (astonishingly to me, as a patriotic Brit) even wanted more restrictions. For what? Lies on death certificates? Never mind the grim toll of lives ruined, suicides, schools closed, rising inequality, depression, cancelled hospital treatments, cancer patients in a torture of waiting, poverty, economic devastation, loneliness,

families kept apart, and so on. How many lives have been lost as a direct result of lockdown? She said that we could join in a national chorus of shock and horror at reaching the 120,000 death toll which was surely certain to have been totally skewed all along, but what about the human cost of lockdown justified by these 'death figures'? The British Medical Journal had reported a 1,493 percent increase in cases of children taken to Great Ormond Street Hospital with abusive head injuries alone and then there was the effect on families: Perhaps the most shocking thing about all this is that families have been kept apart – and obeyed the most irrational, changing rules at the whim of government – because they believed in the statistics. They succumbed to fear, which his generation rejected in that war fought for freedom. Dad (God rest his soul) would be angry. And so am I. Another theme to watch is that in the winter months when there are more deaths from all causes they focus on 'Covid' deaths and in the summer when the British Lung Foundation says respiratory disease plummets by 80 percent they rage on about 'cases'. Either way fascism on population is always the answer. Nazi eugenics in the 21st century Elderly people in care homes have been isolated from their families month after lonely month with no contact with relatives and grandchildren who were banned from seeing them. We were told that lockdown fascism was to 'protect the vulnerable' like elderly people. At the same time Do Not Resuscitate (DNR) orders were placed on their medical files so that if they needed resuscitation it wasn't done and 'Covid-19' went on their death certificates. Old people were not being 'protected' they were being culled – murdered in truth. DNR orders were being decreed for disabled and young people with learning difficulties or psychological problems. The UK Care Quality Commission, a non-departmental body of the Department of Health and Social Care, found that 34 percent of those working in health and social care were pressured into placing 'do not attempt cardiopulmonary resuscitation' orders on 'Covid' patients who suffered from disabilities and learning difficulties without involving the patient or their families in the decision. UK judges ruled that an elderly woman with dementia should have the DNA-manipulating 'Covid vaccine' against her son's wishes and that a man with severe learning difficulties should have the jab despite his family's objections. Never mind

that many had already died. The judiciary always supports doctors and government in fascist dictatorships. They wouldn't dare do otherwise. A horrific video was posted showing fascist officers from Los Angeles police forcibly giving the 'Covid' shot to women with special needs who were screaming that they didn't want it. The same fascists are seen giving the jab to a sleeping elderly woman in a care home. This is straight out of the Nazi playbook. Hitler's Nazis committed mass murder of the mentally ill and physically disabled throughout Germany and occupied territories in the programme that became known as Aktion T4, or just T4. Sabbatian-controlled Hitler and his grotesque crazies set out to kill those they considered useless and unnecessary. The Reich Commissioner for the Scientific Registering of Hereditary and Congenital Illnesses registered the births of babies identified by physicians to have 'defects'. By 1941 alone more than 5,000 children were murdered by the state and it is estimated that in total the number of innocent people killed in Aktion T4 was between 275,000 and 300,000. Parents were told their children had been sent away for 'special treatment' never to return. It is rather pathetic to see claims about plans for new extermination camps being dismissed today when the same force behind current events did precisely that 80 years ago. Margaret Sanger was a Cult operative who used 'birth control' to sanitise her programme of eugenics. Organisations she founded became what is now Planned Parenthood. Sanger proposed that 'the whole dysgenic population would have its choice of segregation or sterilization'. These included epileptics, 'feeble-minded', and prostitutes. Sanger opposed charity because it perpetuated 'human waste'. She reveals the Cult mentality and if anyone thinks that extermination camps are a 'conspiracy theory' their naivety is touching if breathtakingly stupid. If you don't believe that doctors can act with callous disregard for their patients it is worth considering that doctors and medical staff agreed to put government-decreed DNR orders on medical files and do nothing when resuscitation is called for. I don't know what you call such people in your house. In mine they are Nazis from the Josef Mengele School of Medicine. Phenomenal numbers of old people have died worldwide from the effects of lockdown, depression, lack of treatment, the 'vaccine' (more later) and losing the will to live. A

common response at the start of the manufactured pandemic was to remove old people from hospital beds and transfer them to nursing homes. The decision would result in a mass cull of elderly people in those homes through lack of treatment – not ‘Covid’. Care home whistleblowers have told how once the ‘Covid’ era began doctors would not come to their homes to treat patients and they were begging for drugs like antibiotics that oĜen never came. The most infamous example was ordered by New York governor Andrew Cuomo, brother of a moronic CNN host, who amazingly was given an Emmy Award for his handling of the ‘Covid crisis’ by the ridiculous Wokers that hand them out. Just how ridiculous could be seen in February, 2021, when a Department of Justice and FBI investigation began into how thousands of old people in New York died in nursing homes aĜer being discharged from hospital to make way for ‘Covid’ patients on Cuomo’s say-so – and how he and his staff covered up these facts. This couldn’t have happened to a nicer psychopath. Even then there was a ‘Covid’ spin. Reports said that thousands of old people who tested positive for ‘Covid’ in hospital were transferred to nursing homes to both die of ‘Covid’ and transmit it to others. No – they were in hospital because they were ill and the fact that they tested positive with a test not testing for the ‘virus’ is irrelevant. They were ill oĜen with respiratory diseases ubiquitous in old people near the end of their lives. Their transfer out of hospital meant that their treatment stopped and many would go on to die. They’re old. Who gives a damn? I have exposed in the books for decades the Cult plan to cull the world’s old people and even to introduce at some point what they call a ‘demise pill’ which at a certain age everyone would take and be out of here by law. In March, 2021, Spain legalised euthanasia and assisted suicide following the Netherlands, Belgium, Luxembourg and Canada on the Tiptoe to the demise pill. Treatment of old people by many ‘care’ homes has been a disgrace in the ‘Covid’ era. There are many, many, caring staff – I know some. There have, however, been legions of stories about callous treatment of old people and their families. Police were called when families came to take their loved ones home in the light of isolation that was killing them. They became prisoners of the state. Care home residents in insane, fascist Ontario, Canada, were

not allowed to leave their room once the 'Covid' hoax began. UK staff have even wheeled elderly people away from windows where family members were talking with them. Oriana Criscuolo from Stockport in the English North West dropped off some things for her 80-year-old father who has Parkinson's disease and dementia and she wanted to wave to him through a ground-floor window. She was told that was 'illegal'. When she went anyway they closed the curtains in the middle of the day. Oriana It's just unbelievable. I cannot understand how care home staff – people who are being paid to care – have become so uncaring. Their behaviour is inhumane and cruel. It's beyond belief. She was right and this was not a one-off. What a way to end your life in such loveless circumstances. UK registered nurse Nicky Millen, a proper old school nurse for 40 years, said that when she started her career care was based on dignity, choice, compassion and empathy. Now she said 'the things that are important to me have gone out of the window.' She was appalled that people were dying without their loved ones and saying goodbye on iPads. Nicky described how a distressed 89-year-old lady stroked her face and asked her 'how many paracetamol would it take to finish me off'. Life was no longer worth living while not seeing her family. Nicky said she was humiliated in front of the ward staff and patients for letting the lady stroke her face and giving her a cuddle. Such is the dehumanisation that the 'Covid' hoax has brought to the surface. Nicky worked in care homes where patients told her they were being held prisoner. 'I want to live until I die', one said to her. 'I had a lady in tears because she hadn't seen her great-grandson.' Nicky was compassionate old school meeting psychopathic New Normal. She also said she had worked on a 'Covid' ward with no 'Covid' patients. Jewish writer Shai Held wrote an article in March, 2020, which was headlined 'The Staggering, Heartless Cruelty Toward the Elderly'. What he described was happening from the earliest days of lockdown. He said 'the elderly' were considered a group and not unique individuals (the way of the Woke). Shai Held said: Notice how the all-too-familiar rhetoric of dehumanization works: 'The elderly' are bunched together as a faceless mass, all of them considered culprits and thus effectively deserving of the suffering the pandemic will inflict upon them. Lost entirely is the fact that the elderly are

individual human beings, each with a distinctive face and voice, each with hopes and dreams, memories and regrets, friendships and marriages, loves lost and loves sustained. 'The elderly' have become another dehumanised group for which anything goes and for many that has resulted in cold disregard for their rights and their life. The distinctive face that Held talks about is designed to be deleted by masks until everyone is part of a faceless 'War-zone' hospitals myth. Again and again medical professionals have told me what was really going on and how hospitals 'overrun like war zones' according to the media were virtually empty. The mantra from medical whistleblowers was please don't use my name or my career is over. Citizen journalists around the world sneaked into hospitals to film evidence exposing the 'war-zone' lie. They really were largely empty with closed wards and operating theatres. I met a hospital worker in my town on the Isle of Wight during the first lockdown in 2020 who said the only island hospital had never been so quiet. Lockdown was justified by the psychopaths to stop hospitals being overrun. At the same time that the island hospital was near-empty the military arrived here to provide extra beds. It was all propaganda to ramp up the fear to ensure compliance with fascism as were never-used temporary hospitals with thousands of beds known as Nightingales and never-used make-shift mortuaries opened by the criminal UK government. A man who helped to install those extra island beds attributed to the army said they were never used and the hospital was empty. Doctors and nurses 'stood around talking or on their were no masks or social distancing. He accused the useless local island paper, the County Press, of 'pumping the fear as if our hospital was overrun and we only have one so it should have been'. He described ambulances parked up with crews outside in deck chairs. When his brother called an ambulance he was told there was a two- hour backlog which he called 'bullshit'. An old lady on the island fell 'and was in a bad way', but a caller who rang for an ambulance was told the situation wasn't urgent enough. Ambulance stations were working under capacity while people would hear ambulances with sirens blaring driving through the streets. When those living near the stations realised what was going on they would follow them as they left, circulated around an urban area with the sirens going, and then came back

without stopping. All this was to increase levels of fear and the same goes for the 'ventilator shortage crisis' that cost tens of millions for hastily produced ventilators never to be used. Ambulance crews that agreed to be exploited in this way for fear propaganda might find themselves a mirror. I wish them well with that. Empty hospitals were the obvious consequence of treatment and diagnoses of non-'Covid' conditions cancelled and those involved handed a death sentence. People have been dying at home from undiagnosed and untreated cancer, heart disease and other life-threatening conditions to allow empty hospitals to deal with a 'pandemic' that wasn't happening. Death of the innocent 'War-zones' have been laying off nursing staff, even doctors where they can. There was no work for them. Lockdown was justified by saving lives and protecting the vulnerable they were actually killing with DNR orders and preventing empty hospitals being 'overrun'. In Britain the mantra of stay at home to 'save the NHS' was everywhere and across the world the same story was being sold when it was all lies. Two California doctors, Dan Erickson and Artin Massihi at Accelerated Urgent Care in Bakersfield, held a news conference in April, 2020, to say that intensive care units in California were 'empty, essentially', with hospitals shutting floors, not treating patients and laying off doctors. The California health system was working at minimum capacity 'getting rid of doctors because we just don't have the volume'. They said that people with conditions such as heart disease and cancer were not coming to hospital out of fear of 'Covid- 19'. Their video was deleted by Susan Wojcicki's Cult-owned YouTube after reaching five million views. Florida governor Ron Desantis, who rejected the severe lockdowns of other states and is governor was given models claiming they would run out of hospital beds in days. That was never going to happen and the 'modellers' knew it. Deceit can be found at every level of the system. Urgent children's operations were cancelled including fracture repairs and biopsies to spot cancer. Eric Nicholls, a consultant paediatrician, said 'this is obviously concerning and we need to return to normal operating and to increase capacity as soon as possible'. Psychopaths in power were rather less concerned because they are psychopaths. Deletion of urgent care and diagnosis has been happening all over the world and how many kids and others have died

as a result of the actions of these cold and heartless lunatics dictating 'health' policy? The number must be stratospheric. Richard Sullivan, professor of cancer and global health at King's College London, said people feared 'Covid' more than cancer such was the campaign of fear. 'Years of lost life will be quite dramatic', Sullivan said, with 'a huge amount of avoidable mortality'. Sarah Woolnough, executive director for policy at Cancer Research UK, said there had been a 75 percent drop in urgent referrals to hospitals by family doctors of people with suspected cancer. Sullivan said that 'a lot of services have had to scale back – we've seen a dramatic decrease in the amount of elective cancer surgery'. Lockdown deaths worldwide has been absolutely fantastic with the New York Post reporting how data confirmed that 'lockdowns end more lives than they save': There was a sharp decline in visits to emergency rooms and an increase in fatal heart attacks because patients didn't receive prompt treatment. Many fewer people were screened for cancer. Social isolation contributed to excess deaths from dementia and Alzheimer's. Researchers predicted that the social and economic upheaval would lead to tens of thousands of "deaths of despair" from drug overdoses, alcoholism and suicide. As unemployment surged and mental-health and substance-abuse treatment programs were interrupted, the reported levels of anxiety, depression and suicidal thoughts increased dramatically, as did alcohol sales and fatal drug overdoses. This has been happening while nurses and other staff had so much time on their hands in the 'war-zones' that Tic-Tok dancing videos began appearing across the Internet with medical staff dancing around in empty wards and corridors as people died at home from causes that would normally have been treated in hospital. Mentions in dispatches One brave and truth-committed whistleblower was Louise Hampton, a call handler with the UK NHS who made a viral Internet video saying she had done 'fuck all' during the 'pandemic' which was 'a load of bollocks'. She said that 'Covid-19' was rebranded flu and of course she lost her job. This is what happens in the medical and endless other professions now when you tell the truth. Louise filmed inside 'war-zone' accident and emergency departments to show they were empty and I mean empty as in no one there. The mainstream media could have done the same and blown the gaff on



the whole conspiracy. They haven't to their eternal shame. Not that most 'journalists' seem capable of manifesting shame as with the psychopaths they slavishly repeat without question. The relative few who were admitted with serious health problems were left to die alone with no loved ones allowed to see them because of 'Covid' rules and they included kids dying without the comfort of mum and dad at their bedside while the evil behind this couldn't give a damn. It was all good fun to them. A Scottish NHS staff nurse publicly quit in the spring of 2021 saying: 'I can no longer be part of the lies and the corruption by the government.' She said hospitals 'aren't full, the beds aren't full, beds have been shut, wards have been shut'. Hospitals were never busy throughout 'Covid'. The staff nurse said that Nicola Sturgeon, tragically the leader of the Scottish government, was on television saying save the hospitals and the NHS – 'but the beds are empty' and 'we've not seen flu, we always see flu every year'. She wrote to government and spoke with her union Unison (the unions are Cult-compromised and useless, but nothing changed. Many of her colleagues were scared of losing their jobs if they spoke out as they wanted to. She said nursing staff were being affected by wearing masks all day and 'my head is splitting every second from wearing a mask'. The NHS is part of the fascist tyranny and must be dismantled so we can start again with human beings in charge. (Ironically, hospitals were reported to be busier again when official 'Covid' cases fell in spring/summer of 2021 and many other conditions required treatment at the same time as the fake vaccine rollout.) I will cover the 'Covid vaccine' scam in detail later, but it is another indicator of the sickening disregard for human life that I am highlighting here. The DNA-manipulating concoctions do not fulfil the definition of a 'vaccine', have never been used on humans before and were given only emergency approval because trials were not completed and they continued using the unknowing public. The result was what a NHS senior nurse with responsibility for 'vaccine' procedure said was 'genocide'. She said the 'vaccines' were not 'vaccines'. They had not been shown to be safe and claims about their effectiveness by drug companies were 'poetic licence'. She described what was happening as a 'horrid act of human annihilation'. The nurse said that management had instigated a policy of not providing a Patient Information Leaflet (PIL)

before people were 'vaccinated' even though health care professionals are supposed to do this according to protocol. Patients should also be told that they are taking part in an ongoing clinical trial. Her challenges to what is happening had seen her excluded from meetings and ridiculed in others. She said she was told to 'watch my step ... or I would find myself surplus to requirements'. The nurse, who spoke anonymously in fear of her career, said she asked her NHS manager why he/she was content with taking part in genocide against those having the 'vaccines'. The reply was that everyone had to play their part and to 'put up, shut up, and get it done'. Government was 'leaning heavily' on NHS management which was clearly leaning heavily on staff. This is how the global 'medical' hierarchy operates and it starts with the Cult and its World Health. She told the story of a doctor who had the Pfizer jab and when questioned had no idea what was in it. The doctor had never read the literature. We have to stop treating doctors as intellectual giants when so many are moral and medical pygmies. The doctor did not even know that the 'vaccines' were not fully approved or that their trials were ongoing. They were, however, asking their patients if they minded taking part in follow-ups for research purposes – yes, the ongoing clinical trial. The nurse said the doctor's ignorance was not rare and she had spoken to a hospital consultant who had the jab without any idea of the background or that the 'trials' had not been completed. Nurses and pharmacists had shown the same ignorance. 'My NHS colleagues have forsaken their duty of care, broken their code of conduct – Hippocratic Oath – and have been brainwashed just the same as the majority of the UK public through propaganda ...' She said she had not been able to recruit a single NHS colleague, doctor, nurse or pharmacist to stand with her and speak out. Her union had refused to help. She said that if the genocide came to light she would not hesitate to give evidence at a Nuremberg-type trial against those in power who could have affected the outcomes but And all for what? To put the nonsense into perspective let's say the 'virus' does exist and let's go completely crazy and accept that the official manipulated figures for cases and deaths are accurate. Even then a study by Stanford University epidemiologist Dr John Ioannidis published on the World Health Organization website produced an average infection

to fatality rate of ... 0.23 percent! Ioannidis said: 'If one could sample equally from all locations globally, the median infection fatality rate might even be substantially lower than the 0.23% observed in my analysis.' For healthy people under 70 it was ... 0.05 percent! This compares with the 3.4 percent claimed by the Cult-owned World Health Organization when the hoax was first played and maximum fear needed to be generated. An updated Stanford study in April, 2021, put the 'infection' to 'fatality' rate at just 0.15 percent. Another team of scientists led by Megan O'Driscoll and Henrik Salje studied data from 45 countries and published their findings on the Nature website. For children and young people the figure is so small it virtually does not register although authorities will be hyping dangers to the young when they introduce DNA- manipulating 'vaccines' for children. The O'Driscoll study produced an average infection-fatality figure of 0.003 for children from birth to four; 0.001 for 5 to 14; 0.003 for 15 to 19; and it was still only 0.456 up to 64. To claim that children must be 'vaccinated' to protect them from 'Covid' is an obvious lie and so there must be another reason and there is. What's more the average age of a 'Covid' death is akin to the average age that people die in general. The average age of death in England is about 80 for men and 83 for women. The average age of death from alleged 'Covid' is between 82 and 83. California doctors, Dan Erickson and Artin Massihi, said at their April media conference that projection models of millions of deaths had been 'woefully inaccurate'. They produced detailed figures showing that Californians had a 0.03 chance of dying from 'Covid' based on the number of people who tested positive (with a test not testing for the 'virus'). Erickson said there was a 0.1 percent chance of dying from 'Covid' in the state of New York, not just the city, and a 0.05 percent chance in Spain, a centre of 'Covid-19' hysteria at one stage. The Stanford studies supported the doctors' data with fatality rate estimates of 0.23 and 0.15 percent. How close are these figures to my estimate of zero? Death-rate figures claimed by the World Health Organization at the start of the hoax were some 15 times higher. The California doctors said there was no justification for lockdowns and the economic devastation they caused. Everything they had ever learned about quarantine was that you quarantine the sick and not the healthy. They had never seen this

before and it made no medical sense. Why in the light of all this would governments and medical systems the world over say that billions must go under house arrest; lose their livelihood; in many cases lose their mind, their health and their life; force people to wear masks dangerous to health and psychology; make human interaction and even family interaction a criminal offence; ban travel; close restaurants, bars, watching live sport, concerts, theatre, and any activity involving human togetherness and discourse; and closing schools to isolate children from their friends and cause many to commit suicide in acts of hopelessness and despair? The California doctors said lockdown consequences included increased child abuse, partner abuse, alcoholism, depression, and other impacts they were seeing every day. Who would do that to the entire human race if not mentally-ill psychopaths of almost unimaginable extremes like Bill Gates? We must face the reality of what we are dealing with and come out of denial. Fascism and tyranny are made possible only by the target population submitting and acquiescing to fascism and tyranny. The whole of human history shows that to be true. Most people naively and unquestioning believed what they were told about a 'deadly virus' and meekly and weakly submitted to house arrest. Those who didn't believe it – at least in total – still submitted in fear of the draconian fines have been imposed, brutal policing by psychopaths for psychopaths, and condemnation from the meek and weak who condemn the Pushbackers on behalf of the very force that has them, too, in its sights. 'Pathetic' does not even begin to suffice. Britain's brainless 'Health' Secretary Matt Hancock warned anyone lying to border officials about returning from a list of 'hotspot' countries could face a jail sentence of up to ten years which is more than for racially-aggravated assault, incest and attempting to have sex with a child under 13. Hancock is a lunatic, but he has the state apparatus behind him in a Cult-led chain reaction and the same with UK 'Vaccine Minister' Nadhim Zahawi, a prominent member of the mega-Cult secret society, Le Cercle, which featured in my earlier books. The Cult enforces its will on governments and medical systems; government and medical systems enforce their will on business and police; business enforces its will on staff who enforce it on customers; police enforce the will of the Cult on the population and play

their essential part in creating a world of fascist control that their own children and grandchildren will have to live in their entire lives. It is a hierarchical pyramid of imposition and acquiescence and, yes indeed, of clinical insanity. Does anyone bright enough to read this book have to ask what the answer is? I think not, but I will reveal it anyway in the fewest of syllables: Tell the psychos and their moronic lackeys to fuck off and let's get on with our lives. We are many – They are few. War on your mind One believes things because one has been conditioned to believe Aldous Huxley, Brave New World have described the 'Covid' hoax as a 'Psyop' and that is true in every sense and on every level in accordance with the definition of that term which is psychological warfare. Break down the 'Covid pandemic' to the foundation themes and it is psychological warfare on the human individual and collective mind. The same can be said for the entire human belief system involving every subject you can imagine. Huxley was right in his contention that people believe what they are conditioned to believe and this comes from the repetition throughout their lives of the same falsehoods. They spew from government, corporations, media and endless streams of 'experts' telling you what the Cult wants you to believe and often believing it themselves (although far from always). 'Experts' are rewarded with 'prestigious' jobs and titles and as agents of perceptual programming with regular access to the media. The Cult has to control the narrative – control information – or they lose control of the vital, crucial, without-which-they-cannot-prevail public perception of reality. The foundation of that control today is the Internet made possible by the Defense Advanced Research Projects Agency (DARPA), the incredibly sinister technological arm of the Pentagon. The Internet is the result of military technology. DARPA openly brags about establishing the Internet which has been a long-term project to lasso the minds of the global population. I have said for decades the plan is to control information to such an extreme that eventually no one would see or hear anything that the Cult does not approve. We are closing in on that end with ferocious censorship since the 'Covid' hoax began and in my case it started back in the 1990s in terms of books and speaking venues. I had to create my own publishing company in 1995 precisely because no one else would publish my books even

then. I think they're all still To secure total control of information they needed the Internet in which pre-programmed algorithms can seek out 'unclean' content for deletion and even stop it being posted in the first place. The Cult had to dismantle print and non-Internet broadcast media to ensure the transfer of information to the appropriate-named 'Web' – a critical expression of the Cult web. We've seen the ever-quicken demise of traditional media and control of what is leŕ by a tiny number of corporations operating worldwide. Independent journalism in the mainstream is already dead and never was that more obvious than since the turn of 2020. The Cult wants all information communicated via the Internet to globally censor and allow the plug to be pulled any time. Lockdowns and forced isolation has meant that communication between people has been through electronic means and no longer through face-to-face discourse and discussion. Cult psychopaths have targeted the bars, restaurants, sport, venues and meeting places in general for this reason. None of this is by chance and it's to stop people gathering in any kind of privacy or number while being able to track and monitor all Internet communications and block them as necessary. Even private messages between individuals have been censored by these fascists that control Cult fronts like Facebook, Twiŕ, Google and YouTube which are all officially run by Sabbatian place-people and from the background by higher-level Sabbatian place people. Facebook, Google, Amazon and their like were seed-funded and supported into existence with money-no-object infusions of funds either directly or indirectly from DARPA and CIA technology arm In-Q-Tel. The Cult plays the long game and prepares very carefully for big plays like 'Covid'. Amazon is another front in the psychological war and preŕy much controls the global market in book sales and increasingly publishing. Amazon's limitless funds have deleted fantastic numbers of independent publishers to seize global domination on the way to deciding which books can be sold and circulated and which cannot. Moves in that direction are already happening. Amazon's leading light Jeff Bezos is the grandson of Lawrence Preston Gise who worked with DARPA predecessor ARPA. Amazon has big connections to the CIA and the Pentagon. The plan I have long described went like this: 1. Employ military technology to establish the Internet. 2.

Sell the Internet as a place where people can freely communicate without censorship and allow that to happen until the Net becomes the central and irreversible pillar of human society. If the Internet had been highly censored from the start many would have rejected it.

3. Fund and manipulate major corporations into being to control the circulation of information on your Internet using cover stories about geeks in garages to explain how they came about. Give them unlimited funds to expand rapidly with no need to make a profit for years while non-Cult companies who need to balance the books cannot compete. You know that in these circumstances your Googles, YouTubes, Facebooks and Amazons are going to secure near monopolies by either crushing or buying up the opposition.

4. Allow freedom of expression on both the Internet and communication platforms to draw people in until the Internet is the central and irreversible pillar of human society and your communication corporations have reached a stage of near monopoly domination.

5. Then unleash your always-planned frenzy of censorship on the basis of 'where else are you going to go?' and continue to expand that until nothing remains that the Cult does not want its human targets to see. The process was timed to hit the 'Covid' hoax to ensure the best chance possible of controlling the narrative which they knew they had to do at all costs. They were, after all, about to unleash a 'deadly virus' that didn't really exist. If you do that in an environment of free-flowing information and opinion you would be dead in the water before you could say Gates is a psychopath. The network was in place through which the Cult-created-and-owned World Health Organization could dictate the 'Covid' narrative and response policy slavishly supported by Cult-owned Internet communication giants and mainstream media while those telling a different story were censored. Google, YouTube, Facebook and Twitter openly announced that they would do this. What else would we expect from Cult-owned operations like Facebook which former executives have confirmed set out to make the platform more addictive than cigarettes and coldly manipulates emotions of its users to sow division between people and groups and scramble the minds of the young? If Zuckerberg lives out the rest of his life without going to jail for crimes against humanity, and most emphatically against the young, it will be a travesty

of justice. Still, no matter, cause and effect will catch up with him eventually and the same with Sergey Brin and Larry Page at Google with its CEO Sundar Pichai who fix the Google search results to promote Cult narratives and hide the opposition. Put the same key words into Google and other search engines like DuckDuckGo and you will see how different results can be. Wikipedia is another intensely biased 'encyclopaedia' which skews its content to the Cult agenda. YouTube links to Wikipedia's version of 'Covid' and 'climate change' on video pages in which experts in their field offer a different opinion (even that is increasingly rare with Wojcicki censorship). Into this 'Covid' silence- them network must be added government media censors, sorry 'regulators', such as Ofcom in the UK which imposed tyrannical restrictions on British broadcasters that had the effect of banning me from ever appearing. Just to debate with me about my evidence and views on 'Covid' would mean breaking the fascistic impositions of Ofcom and its CEO career government bureaucrat Melanie Dawes. Gutless British broadcasters tremble at the very thought of fascist Psychos behind 'Covid' The reason for the 'Covid' catastrophe in all its facets and forms can be seen by whom and what is driving the policies worldwide in such a coordinated way. Decisions are not being made to protect health, but to target psychology. The dominant group guiding and 'advising' government policy are not medical professionals. They are psychologists and behavioural scientists. Every major country has its own version of this phenomenon and I'll use the British example to show how it works. In many ways the British version has been affecting the wider world in the form of the huge behaviour manipulation network in the UK which operates in other countries. The network involves private companies, government, intelligence and military. The Cabinet Office is at the centre of the government 'Covid' Psyop and part-owns, with 'innovation charity' Nesta, the Behavioural Insights Team (BIT) which claims to be independent of government but patently isn't. The BIT was established in 2010 and its job is to manipulate the psyche of the population to acquiesce to government demands and so much more. It is also known as the 'Nudge Unit', a name inspired by the 2009 book by two ultra- Zionists, Cass Sunstein and Richard Thaler, called Nudge: Improving Decisions About Health, Wealth, and Happiness. The



book, as with the Behavioural Insights Team, seeks to 'nudge' behaviour (manipulate it) to make the public follow patterns of action and perception that suit those in authority (the Cult). Sunstein is so skilled at this that he advises the World Health Organization and the UK Behavioural Insights Team and was Administrator of the White House Office of Information and Regulatory Affairs in the Obama administration. Biden appointed him to the Department of Homeland Security – another ultra-Zionist in the fold to oversee new immigration laws which is another policy the Cult wants to control. Sunstein is desperate to silence anyone exposing conspiracies and co-authored a 2008 report on the subject in which suggestions were offered to ban 'conspiracy theorizing' or impose 'some kind of tax, financial or otherwise, on those who disseminate such theories'. I guess a psychiatrist's chair is out of the question? Sunstein's mate Richard Thaler, an 'academic affiliate' of the UK Behavioural Insights Team, is a proponent of 'behavioural economics' which is defined as the study of 'the effects of psychological, cognitive, emotional, cultural and social factors on the decisions of individuals and institutions'. Study the effects so they can be manipulated to be what you want them to be. Other leading names in the development of behavioural economics are ultra-Zionists Daniel Kahneman and Robert J. Shiller and they, with Thaler, won the Nobel Memorial Prize in Economic Sciences for their work in this field. The Behavioural Insights Team is operating at the heart of the UK government and has expanded globally through partnerships with several universities including Harvard, Oxford, Cambridge, University College London (UCL) and Pennsylvania. They claim to have 'trained' (reframed) 20,000 civil servants and run more than 750 projects involving 400 randomised controlled trials in dozens of countries' as another version of mind reframers Common Purpose. BIT works from its office in New York with cities and their agencies, as well as other partners, across the United States and Canada – this is a company part-owned by the British government Cabinet Office. An executive order by President Cult-servant Obama established a US Social and Behavioral Sciences Team in 2015. They all have the same reason for being and that's to brainwash the population directly and by brainwashing those in positions of 'Covid' mind game. Another prime aspect of the UK

mind-control network is the 'independent' [joke] Scientific Pandemic Insights Group on Behaviours (SPI-B) which 'provides behavioural science advice aimed at anticipating and helping people adhere to interventions that are recommended by medical or epidemiological experts'. That means manipulating public perception and behaviour to do whatever government tells them to do. It's disgusting and if they really want the public to be 'safe' this lot should all be under lock and key. According to the government website SPI-B consists of 'behavioural scientists, health and social psychologists, anthropologists and historians' and advises the Whîjy-Vallance-led Scientific Advisory Group for Emergencies (SAGE) which in turn advises the government on 'the science' (it doesn't) and 'Covid' policy. When politicians say they are being guided by 'the science' this is the rabble in each country they are talking about and that 'science' is dominated by behaviour manipulators to enforce government fascism through public compliance. The Behaviour Insight Team is headed by psychologist David Solomon Halpern, a visiting professor at King's College London, and connects with a national and global web of other civilian and military organisations as the Cult moves towards its goal of fusing them into one fascistic whole in every country through its 'Fusion Doctrine'. The behaviour manipulation network involves, but is not confined to, the Foreign Office; National Security Council; government communications headquarters (GCHQ); MI5; MI6; the Cabinet Office-based Media Monitoring Unit; and the Rapid Response Unit which 'monitors digital trends to spot emerging issues; including misinformation and disinformation; and identifies the best way to respond'. There is also the 77th Brigade of the UK military which operates like the notorious Israeli military's Unit 8200 in manipulating information and discussion on the Internet by posing as members of the public to promote the narrative and discredit those who challenge it. Here we have the military seeking to manipulate domestic public opinion while the Nazis in government are fine with that. Conservative Member of Parliament Tobias Ellwood, an advocate of lockdown and control through 'vaccine passports', is a Lieutenant Colonel reservist in the 77th Brigade which connects with the military operation jHub, the 'innovation centre' for the Ministry of Defence and Strategic Command. jHub has also been

involved with the civilian National Health Service (NHS) in 'symptom tracing' the population. The NHS is a key part of this mind control network and produced a document in December, 2020, explaining to staff how to use psychological manipulation with different groups and ages to get them to have the DNA-manipulating 'Covid vaccine' that's designed to cumulatively rewrite human genetics. The document, called 'Optimising Vaccination Roll Out - Do's and Don'ts for all messaging, documents and "communications" in the widest sense', was published by NHS England and the NHS Improvement Behaviour Change Unit in partnership with Public Health England and Warwick Business School. I hear the mantra about 'save the NHS' and 'protect the NHS' when we need to scrap the NHS and start again. The current version is far too corrupt, far too anti-human and totally compromised by Cult operatives and their assets. UK government broadcast media censor Ofcom will connect into this web - as will the BBC with its tremendous Ofcom influence - to control what the public see and hear and dictate mass perception. Nuremberg trials must include personnel from all these The fear factor The 'Covid' hoax has led to the creation of the UK Cabinet Office- connected Joint Biosecurity Centre (JBC) which is officially described as providing 'expert advice on pandemics' using its independent [all Cult operations are 'independent'] analytical function to provide real-time analysis about infection outbreaks to identify and respond to outbreaks of Covid-19'. Another role is to advise the government on a response to spikes in infections - 'for example by closing schools or workplaces in local areas where infection levels have risen'. Put another way, promoting the Cult agenda. The Joint Biosecurity Centre is modelled on the Joint Terrorism Analysis Centre which analyses intelligence to set 'terrorism threat levels' and here again you see the fusion of civilian and military operations and intelligence that has led to military intelligence producing documents about 'vaccine hesitancy' and how it can be combated. Domestic civilian matters and opinions should not be the business of the military. The Joint Biosecurity Centre is headed by Tom Hurd, director general of the Office for Security and Counter-Terrorism from the establishment-to-its-fingertips Hurd family. His father is former Foreign Secretary Douglas Hurd. How coincidental that Tom Hurd went to the elite

Eton College and Oxford University with Boris Johnson. Imperial College with its ridiculous computer modeller Neil Ferguson will connect with this gigantic web that will itself interconnect with similar set-ups in other major and not so major countries. Compared with this Cult network the politicians, be they Boris Johnson, Donald Trump or Joe Biden, are bit-part players 'following the science'. The network of psychologists was on the 'Covid' case from the start with the aim of generating maximum fear of the 'virus' to ensure compliance by the population. A government behavioural science group known as SPI-B produced a paper in March, 2020, for discussion by the main government science advisory group known as SAGE. It was headed 'Options for increasing adherence to social distancing measures' and it said the following in a section headed 'Persuasion': A substantial number of people still do not feel sufficiently personally threatened; it could be that they are reassured by the low death rate in their demographic group, although levels of concern may be rising. Having a good understanding of the risk has been found to be positively associated with adoption of COVID-19 social distancing measures in Hong Kong. The perceived level of personal threat needs to be increased among those who are complacent, using hard-hitting evaluation of options for increasing social distancing emotional messaging. To be effective this must also empower people by making clear the actions they can take to reduce the threat. Responsibility to others: There seems to be insufficient understanding of, or feelings of responsibility about, people's role in transmitting the infection to others ... Messaging about actions need to be framed positively in terms of protecting oneself and the community, and increase confidence that they will be effective. Some people will be more persuaded by appeals to play by the rules, some by duty to the community, and some to personal risk. All these different approaches are needed. The messaging also needs to take account of the realities of different people's lives. Messaging needs to take account of the different motivational levers and circumstances of different people. All this could be achieved the SPI-B psychologists said by using the media to increase the sense of personal threat which translates as terrify the shit out of the population, including children, so they all do what we want. That's not happened

has it? Those excuses for 'journalists' who wouldn't know journalism if it bit them on the arse (the great majority) have played their crucial part in serving this Cult- government Psyop to enslave their own kids and grandkids. How they live with themselves I have no idea. The psychological war has been underpinned by constant government 'Covid' propaganda in almost every television and radio ad break, plus the Internet and print media, which has pounded out the fear with taxpayers footing the bill for their own programming. The result has been people terrified of a 'virus' that doesn't exist or one with a tiny fatality rate even if you believe it does. People walk down the street and around the shops wearing face-nappies damaging their health and psychology while others report those who refuse to be that naïve to the police who turn up in their own face-nappies. I had a cameraman come to my flat and he was so frightened of 'Covid' he came in wearing a mask and refused to shake my hand in case he caught something. He had – naïveitis – and the thought that he worked in the mainstream media was both depressing and made his behaviour perfectly explainable. The fear which has gripped the minds of so many and frozen them into compliance has been carefully cultivated by these psychologists who are really psychopaths. If lives get destroyed and a lot of young people commit suicide it shows our plan is working. SPI-B then turned to compulsion on the public to comply. 'With adequate preparation, rapid change can be achieved', it said. Some countries had introduced mandatory self-isolation on a wide scale without evidence of major public unrest and a large majority of the UK's population appeared to be supportive of more coercive measures with 64 percent of adults saying they would support putting London under a lockdown (watch the 'polls' which are designed to make people believe that public opinion is in favour or against whatever the subject in hand). For 'aggressive protective measures' to be effective, the SPI-B paper said, special attention should be devoted to those population groups that are more at risk. Translated from the Orwellian this means making the rest of population feel guilty for not protecting the 'vulnerable' such as old people which the Cult and its agencies were about to kill on an industrial scale with lockdown, lack of treatment and the Gates 'vaccine'. Psychopath psychologists sold their

guilt-trip so comprehensively that Los Angeles County Supervisor Hilda Solis reported that children were apologising (from a distance) to their parents and grandparents for bringing 'Covid' into their homes and getting them sick. '... These apologies are just some of the last words that loved ones will ever hear as they die alone,' she said. Gut-wrenchingly Solis then used this childhood tragedy to tell children to stay at home and 'keep your loved ones alive'. Imagine heaping such potentially life-long guilt on a kid when it has absolutely nothing to do with them. These people are deeply disturbed and the psychologists behind this even more so. Uncivil war – divide and rule Professional mind-controllers at SPI-B wanted the media to increase a sense of responsibility to others (do as you're told) and promote 'positive messaging' for those actions while in contrast to invoke 'social disapproval' by the unquestioning, obedient, community of anyone with a mind of their own. Again the compliant Goebbels-like media obliged. This is an old, old, trick employed by tyrannies the world over throughout human history. You get the target population to keep the target population in line – your line. SPI-B said this could 'play an important role in preventing anti-social behaviour or discouraging failure to enact pro-social behaviour'. For 'anti-social' in the Orwellian parlance of SPI-B see any behaviour that government doesn't approve. SPI-B recommendations said that 'social disapproval' should be accompanied by clear messaging and promotion of strong collective identity – hence the government and celebrity mantra of 'we're all in this together'. Sure we are. The mind doctors have such contempt for their targets that they think some clueless comedian, actor or singer telling them to do what the government wants will be enough to win them over. We have had UK comedian Lenny Henry, actor Michael Caine and singer Elton John wheeled out to serve the propagandists by urging people to have the DNA-manipulating 'Covid' non-'vaccine'. The role of Henry and fellow black celebrities in seeking to coax a 'vaccine' especially stomach-turning. An emotion-manipulating script and carefully edited video featuring these black 'celebs' was such an insult to the intelligence of black people and where's the self-respect of those involved selling their souls to a fascist government agenda? Henry said he heard black people's 'legitimate worries and exactly that

by not having the 'vaccine'. They had to include the obligatory reference to Black Lives Matter with the line ... 'Don't let coronavirus cost even more black lives – because we matter'. My god, it was pathetic. 'I know the vaccine is safe and what it does.' How? 'I'm a comedian and it says so in my script.' SPI-B said social disapproval needed to be carefully managed to avoid victimisation, scapegoating and misdirected criticism, but they knew that their 'recommendations' would lead to exactly that and the media were specifically used to stir-up the divide-and-conquer hostility. Those who conform like good little baa, baas, are praised while those who have seen through the tidal wave of lies are 'Covidiot'. The awake have been abused by the fast asleep for not conforming to fascism and impositions that the awake know are designed to endanger their health, dehumanise them, and tear asunder the very fabric of human society. We have had the curtain- twitchers and morons reporting neighbours and others to the face- slapped police for breaking 'Covid rules' with fascist police delighting in posting links and phone numbers where this could be done. The Cult cannot impose its will without a compliant police and military or a compliant population willing to play their part in enslaving themselves and their kids. The words of a pastor in Nazi Germany are so appropriate today: First they came for the socialists and I did not speak out because I was not a socialist. Then they came for the trade unionists and I did not speak out because I was not a trade unionist. Then they came for the Jews and I did not speak out because I was not a Jew. Then they came for me and there was no one left to speak for me. Those who don't learn from history are destined to repeat it and so 'Covid' rules: Rewiring the mind With the background laid out to this gigantic national and global web of psychological manipulation we can put 'Covid' rules into a clear and sinister perspective. Forget the claims about protecting health. 'Covid' rules are about dismantling the human mind, breaking the human spirit, destroying self-respect, and then putting Humpty Dumpty together again as a servile, submissive slave. Social isolation through lockdown and distancing have devastating effects on the human psyche as the psychological psychopaths well know and that's the real reason for them. Humans need contact with each other, discourse, closeness and touch, or they eventually, and literally, go

crazy. Masks, which I will address at some length, fundamentally add to the effects of isolation and the Cult agenda to dehumanise and de-individualise the population. To do this while knowing – in fact seeking – this outcome is the very epitome of evil and psychologists involved in this are the epitome of evil. They must like all the rest of the Cult demons and their assets stand trial for crimes against humanity on a scale that defies the imagination. Psychopaths in uniform use isolation to break enemy troops and agents and make them subservient and submissive to tell what they know. The technique is rightly considered a form of torture and torture is most certainly what has been imposed on the human. Clinically-insane American psychologist Harry Harlow became famous for his isolation experiments in the 1950s in which he separated baby monkeys from their mothers and imprisoned them for months on end in a metal container or ‘pit of despair’. They soon began to show mental distress and depression as any idiot could have predicted. Harlow put other monkeys in steel chambers for three, six or twelve months while denying them any contact with animals or humans. He said that the effects of total social isolation for six months were ‘so devastating and debilitating that we had assumed initially that twelve months of isolation would not produce any additional decrement’; but twelve months of isolation ‘almost obliterated the animals socially’. This is what the Cult and its partial isolation in which they were not allowed to form relationships with other monkeys became ‘aggressive and hostile, not only to others, but also towards their own bodies’. We have seen this in the young as a consequence of lockdown. UK government psychopaths launched a public relations campaign telling people not to hug each other even after they received the ‘Covid-19 vaccine’ which we were told with more lies would allow a return to ‘normal life’. A government source told The Telegraph: ‘It will be along the lines that it is great that you have been vaccinated, but if you are going to visit your family and hug your grandchildren there is a chance you are going to infect people you love.’ The source was apparently speaking from a secure psychiatric facility. Janet Lord, director of Birmingham University’s Institute of Inflammation and Ageing, said that parents and grandparents should avoid hugging their children. Well, how can I put it, Ms Lord? Fuck off. Yep, that’ll Destroying



the kids – where are the parents? Observe what has happened to people enslaved and isolated by lockdown as suicide and self-harm has soared worldwide, particularly among the young denied the freedom to associate with their friends. A study of 49,000 people in English-speaking countries concluded that almost half of young adults are at clinical risk of mental health disorders. A national survey in America of 1,000 currently enrolled high school and college students found that 5 percent reported attempting suicide during the pandemic. Data from the US CDC's National Syndromic Surveillance Program from January 1st to October 17th, 2020, revealed a 31 percent increase in mental health issues among adolescents aged 12 to 17 compared with 2019. The CDC reported that America in general suffered the biggest drop in life expectancy since World War Two as it fell by a year in the first half of 2020 as a result of 'deaths of despair' – overdoses and suicides. Deaths of despair have leapt by more than 20 percent during lockdown and include the highest number of fatal overdoses ever recorded in a single year – 81,000. Internet addiction is another consequence of being isolated at home which lowers interest in physical activities as kids fall into inertia and what's the point? Children and young people are losing hope and giving up on life, sometimes literally. A 14-year-old boy killed himself in Maryland because he had 'given up' when his school district didn't reopen; an 11-year-old boy shot himself during a zoom class; a teenager in Maine succumbed to the isolation of the 'pandemic' when he ended his life after experiencing a disrupted senior year at school. Children as young as nine have taken their life and all these stories can be repeated around the world. Careers are being destroyed before they start and that includes those in sport in which promising youngsters have not been able to take part. The plan of the psycho-psychologists is working all right. Researchers at Cambridge University found that lockdowns cause significant harm to children's mental health. Their study was published in the Archives of Disease in Childhood, and followed 168 children aged between 7 and 11. The researchers concluded: During the UK lockdown, children's depression symptoms have increased substantially, relative to before lockdown. The scale of this effect has direct relevance for the continuation of different elements of lockdown policy, such as complete or

partial school closures ... Specifically, we observed a statistically significant increase in ratings of depression, with a medium-to-large effect size. Our findings emphasise the need to incorporate the potential impact of lockdown on child mental health in planning the ongoing response to the global pandemic and the recovery from it. Not a chance when the Cult's psycho-psychologists were getting exactly what they wanted. The UK's Royal College of Paediatrics and Child Health has urged parents to look for signs of eating disorders in children and young people after a three to four fold increase. Specialists say the 'pandemic' is a major reason behind the rise. You don't say. The College said isolation from friends during school closures, exam cancellations, loss of extra-curricular activities like sport, and an increased use of social media were all contributory factors along with fears about the virus (psycho-psychologists again), family finances, and students being forced to quarantine. Doctors said young people were becoming severely ill by the time they were seen with 'Covid' regulations reducing face-to-face consultations. Nor is it only the young that have been devastated by the psychopaths. Like all bullies and cowards the Cult is targeting the young, elderly, weak and infirm. A typical story was told by a British lady called Lynn Parker who was not allowed to visit her husband in 2020 for the last ten and half months of his life 'when he needed me most' between March 20th and when he died on December 19th. This vacates the criminal and enters the territory of evil. The emotional impact on the immune system alone is immense as are the number of people of all ages worldwide who have died as a result of Cult-demanded, Gates-demanded, lockdowns. Isolation is torture The experience of imposing solitary confinement on millions of prisoners around the world has shown how a large percentage become 'actively psychotic and/or acutely suicidal'. Social isolation has been found to trigger 'a specific psychiatric syndrome, characterized by hallucinations; panic attacks; overt paranoia; diminished impulse control; hypersensitivity to external stimuli; and difficulties with thinking, concentration and memory'. Juan Mendez, a United Nations rapporteur (investigator), said that isolation is a form of torture. Research has shown that even after isolation prisoners find it far more difficult to make social connections and I remember changing

to a shop assistant after one lockdown who told me that when her young son met another child again he had no idea how to act or what to do. Hannah Flanagan, Director of Emergency Services at Journey Mental Health Center in Dane County, Wisconsin, said: 'The specificity about Covid social distancing and isolation that we've come across as contributing factors to the suicides are really new to us this year.' But they are not new to those that devised them. They are getting the effect they want as the population is psychologically dismantled to be rebuilt in a totally different way. Children and the young are particularly targeted. They will be the adults when the full-on fascist AI-controlled technocracy is planned to be imposed and they are being prepared to meekly submit. At the same time older people who still have a memory of what life was like before – and how fascist the new normal really is – are being deleted. You are going to see efforts to turn the young against the old to support this geriatric genocide. Hannah Flanagan said the big increase in suicide in her county proved that social isolation is not only harmful, but deadly. Studies have shown that isolation from others is one of the main risk factors in suicide and even more so with women. Warnings that lockdown could create a 'perfect storm' for suicide were ignored. After all this was one of the reasons for lockdown. Suicide, however, is only the most extreme of isolation consequences. There are many others. Dr Dhruv Khullar, assistant professor of healthcare policy at Weill Cornell Medical College, said in a New York Times article in 2016 long before the fake 'pandemic': A wave of new research suggests social separation is bad for us. Individuals with less social connection have disrupted sleep patterns, altered immune systems, more inflammation and higher levels of stress hormones. One recent study found that isolation increases the risk of heart disease by 29 percent and stroke by 32 percent. Another analysis that pooled data from 70 studies and 3.4 million people found that socially isolated individuals had a 30 percent higher risk of dying in the next seven years, and that this effect was largest in middle age. Loneliness can accelerate cognitive decline in older adults, and isolated individuals are twice as likely to die prematurely as those with more robust social interactions. These effects start early: Socially isolated children have significantly poorer health 20 years later, even after

controlling for other factors. All told, loneliness is as important a risk factor for early death as obesity and smoking. There you have proof from that one article alone four years before 2020 that those who have enforced lockdown, social distancing and isolation knew what the effect would be and that is even more so with professional psychologists that have been driving the policy across the globe. We can go back even further to the years 2000 and 2003 and the start of a major study on the effects of isolation on health by Dr Janine Gronewold and Professor Dirk M. Hermann at the University Hospital in Essen, Germany, who analysed data on 4,316 people with an average age of 59 who were recruited for the long-term research project. They found that socially isolated people are more than 40 percent more likely to have a heart attack, stroke, or other major cardiovascular event and nearly 50 percent more likely to die from any cause. Given the financial Armageddon unleashed by lockdown we should note that the study found a relationship between increased cardiovascular risk and lack of financial support. After excluding other factors social isolation was still connected to a 44 percent increased risk of cardiovascular problems and a 47 percent increased risk of death by any cause. Lack of financial support was associated with a 30 percent increase in the risk of cardiovascular health events. Dr Gronewold said it had been known for some time that feeling lonely or lacking contact with close friends and family can have an impact on physical health and the study had shown that having strong social relationships is of high importance for heart health. Gronewold said they didn't understand yet why people who are socially isolated have such poor health outcomes, but this was obviously a worrying finding, particularly during these times of prolonged social distancing. Well, it can be explained on many levels. You only have to identify the point in the body where people feel loneliness and missing people they are parted from – it's in the centre of the chest where they feel the ache of loneliness and the ache of missing people. 'My heart aches for you' ... 'My heart aches for some company.' I will explain this more in the chapter Escaping Wetiko, but when you realise that the body is the mind – they are expressions of each other – the reason why state of the mind dictates state of the body becomes clear. American psychologist Ranjit Powar was highlighting the effects of

lockdown isolation as early as April, 2020. She said humans have evolved to be social creatures and are wired to live in interactive groups. Being isolated from family, friends and colleagues could be unbalancing and traumatic for most people and could result in short or even long-term psychological and physical health problems. An increase in levels of anxiety, aggression, depression, forgetfulness and hallucinations were possible psychological effects of isolation. 'Mental conditions may be precipitated for those with underlying pre-existing susceptibilities and show up in many others without any pre-condition.' Powar said personal relationships helped us cope with stress and if we lost this outlet for letting off steam the result can be a big emotional void which, for an average person, was difficult to deal with. 'Just a few days of isolation can cause increased levels of anxiety and depression' – so what the hell has been the effect on the global population of 18 months of this at the time of writing? Powar said: 'Add to it the looming threat of a dreadful disease being repeatedly hammered in through the media and you have a recipe for many shades of mental and physical distress.' For those with a house and a garden it is easy to forget that billions have had to endure lockdown isolation in tiny overcrowded flats and apartments with nowhere to go outside. The psychological and physical consequences of this are unimaginable and with lunatic and abusive partners and parents the consequences have led to tremendous increases in domestic and child abuse and alcoholism as people seek to shut out the horror. Ranjit Powar said: Staying in a confined space with family is not all a rosy picture for everyone. It can be extremely oppressive and claustrophobic for large low-income families huddled together in small single-room houses. Children here are not lucky enough to have many board/electronic games or books to keep them occupied. Add to it the deep insecurity of running out of funds for food and basic necessities. On the other hand, there are people with dysfunctional family dynamics, such as domineering, abusive or alcoholic partners, siblings or parents which makes staying home a period of trial. Incidence of suicide and physical abuse against women has shown a worldwide increase. Heightened anxiety and depression also affect a person's immune system, making them more susceptible to illness. To think that Powar's article was

published on April 11th, 2020. Social (unsocial) distancing demanded that people stay six feet or two metres apart. UK government advisor Robert Dingwall from the New and Emerging Respiratory Virus Threats Advisory Group said in a radio interview that the two-metre rule was 'conjured up out of nowhere' and was not based on science. No, it was not based on medical science, but it didn't come out of nowhere. The distance related to psychological science. Six feet/two metres was adopted in many countries and we were told by people like the criminal Anthony Fauci and his ilk that it was founded on science. Many schools could not reopen because they did not have the space for six- foot distancing. Then in March, 2021, after a year of six-feet 'science', a study published in the Journal of Infectious Diseases involving more than 500,000 students and almost 100,000 staff over 16 weeks revealed no significant difference in 'Covid' cases between six feet and three feet and Fauci changed his tune. Now three feet was okay. There is no difference between six feet and three inches when there is no 'virus' and they got away with six feet for psychological reasons for as long as they could. I hear journalists and others talk about 'unintended consequences' of lockdown. They are not unintended at all; they have been coldly-calculated for a specific outcome of human control and that's why super-psychopaths like Gates have called for them so vehemently. Super-psychopath psychologists have demanded them and psychopathic or clueless, spineless, politicians have gone along with them by 'following the science'. But it's not science at all. 'Science' is not what is; it's only what people can be manipulated to believe it is. The whole 'Covid' catastrophe is founded on mind control. Three word or three statement mantras issued by the UK government are a well-known mind control technique and so we've had 'Stay home/protect the NHS/save lives', 'Stay alert/control the virus/save lives' and 'hands/face/space'. One of the most vocal proponents of extreme 'Covid' rules in the UK has been Professor Susan Michie, a member of the British Communist Party, who is not a medical professional. Michie is the director of the Centre for Behaviour Change at University College London. She is a behavioural psychologist and another filthy rich 'Marxist' who praised China's draconian lockdown. She was known by fellow students at Oxford University as 'Stalin's nanny' for her extreme Marxism.

Michie is an influential member of the UK government's Scientific Advisory Group for Emergencies (SAGE) and behavioural manipulation groups which have dominated 'Covid' policy. She is a consultant adviser to the World Health Organization on 'Covid-19' and behaviour. Why the hell are lockdowns anything to do with her when they are claimed to be about health? Why does a behavioural psychologist from a group charged with changing the behaviour of the public want lockdown, human isolation and mandatory masks? Does that question really need an answer? Michie absolutely has to explain herself before a Nuremberg court when humanity takes back its world again and even more so when you see the consequences of masks that she demands are compulsory. This is a Michie classic: The benefits of getting primary school children to wear masks is that regardless of what little degree of transmission is occurring in those age groups it could help normalise the practice. Young children wearing masks may be more likely to get their families to accept masks. Those words alone should carry a prison sentence when you ponder on the callous disregard for children involved and what a statement it makes about the mind and motivations of Susan Michie. What a lovely lady and what she said there encapsulates the mentality of the psychopaths behind the 'Covid' horror. Let us compare what Michie said with a countrywide study in Germany published at [researchsquare.com](https://www.researchsquare.com) involving 25,000 school children and 17,854 health complaints submitted by parents. Researchers found that masks are harming children physically, psychologically, and behaviourally with 24 health issues associated with mask wearing. They include: shortness of breath (29.7%); dizziness (26.4%); increased headaches (53%); difficulty concentrating (50%); drowsiness or fatigue (37%); and malaise (42%). Nearly a third of children experienced more sleep issues than before and a quarter developed new fears. Researchers found health issues and other impairments in 68 percent of masked children covering their faces for an average of 4.5 hours a day. Hundreds of those taking part experienced accelerated respiration, tightness in the chest, weakness, and short-term impairment of consciousness. A reminder of what Michie said again: The benefits of getting primary school children to wear masks is that regardless of what little degree of

transmission is occurring in those age groups it could help normalise the practice. Young children wearing masks may be more likely to get their families to accept masks. Psychopaths in government and psychology now have children and young people – plus all the adults – wearing masks for hours on end while clueless teachers impose the will of the psychopaths on the Cult lab rats. We have some schools already imposing on students microchipped buzzers that activate when they get ‘too close’ to their pals in the way they do with lab rats. How apt. To the Cult and its brain-dead servants our children are lab rats being conditioned to be unquestioning, dehumanised slaves for the rest of their lives. Children and young people are being weaned and frightened away from the most natural human instincts including closeness and touch. I have tracked in the books over the years how schools were banning pupils from greeting each other with a hug and the whole Cult-induced Me Too movement has terrified men and boys from a relaxed and natural interaction with female friends and work colleagues to the point where many men try never to be in a room alone with a woman that’s not their partner. Airhead celebrities have as always played their virtue-signalling part in making this happen with their gross exaggeration. For every monster like Harvey Weinstein there are at least tens of thousands of men that don’t treat women like that; but everyone must be branded the same and policy changed for them as well as the monster. I am going to be using the word ‘dehumanise’ many times in this chapter because that is what the Cult is seeking to do and it goes very deep as we shall see. Don’t let them kid you that social distancing is planned to end one day. That’s not the idea. We are seeing more governments and companies funding and producing wearable gadgets to keep people apart and tech start-up company backed by GCHQ, the British Intelligence and military surveillance headquarters, has created a social distancing wrist sensor that alerts people when they get too close to others. The CIA has also supported tech companies developing similar devices. The wearable sensor was developed by Tended, one of a number of start-up companies supported by GCHQ (see the CIA and DARPA). The device can be worn on the wrist or as a tag on the waistband and will vibrate whenever someone wearing the device breaches social



distancing and gets anywhere near natural human contact. The company had a lucky break in that it was developing a distancing sensor when the 'Covid' hoax arrived which immediately provided a potentially enormous market. How fortunate. The government in big-time Cult-controlled Ontario in Canada is investing \$2.5 million in wearable contact tracing technology that 'will alert users if they may have been exposed to the Covid-19 in the workplace and will beep or vibrate if they are within six feet of another person'. Facedrive Inc., the technology company behind this, was founded in 2016 with funding from the Ontario Together Fund and obviously they, too, had a prophet on the board of directors. The human surveillance and control technology is called TraceSCAN and would be worn by the human cyborgs in places such as airports, workplaces, construction sites, care homes and ... schools. I emphasise schools with children and young people the prime targets. You know what is planned for society as a whole if you keep your eyes on the schools. They have always been places where the state program the next generation of slaves to be its compliant worker-ants – or Woker-ants these days; but in the mist of the 'Covid' madness they have been transformed into mind laboratories on a scale never seen before. Teachers and head teachers are just as programmed as the kids – oĜen more so. Children are kept apart from human interaction by walk lanes, classroom distancing, staggered meal times, masks, and the rolling-out of buzzer systems. Schools are now physically laid out as a laboratory maze for lab-rats. Lunatics at a school in Anchorage, Alaska, who should be prosecuted for child abuse, took away desks and forced children to kneel (know your place) on a mat for five hours a day while wearing a mask and using their chairs as a desk. How this was supposed to impact on a 'virus' only these clinically insane people can tell you and even then it would be clap-trap. The school banned recess (interaction), art classes (creativity), and physical exercise (geĴing body and mind moving out of inertia). Everyone behind this outrage should be in jail or beĴer still a mental institution. The behavioural manipulators are all for this dystopian approach to schools. Professor Susan Michie, the mind-doctor and British Communist Party member, said it was wrong to say that schools were safe. They had to be made so by 'distancing', masks and

ventilation (sijng all day in the cold). I must ask this lady round for dinner on a night I know I am going to be out and not back for weeks. She probably wouldn't be able to make it, anyway, with all the visits to her own psychologist she must have block-booked. I know how shocking it must be for you that a behaviour manipulator like Michie wants everyone to wear masks which have long been a feature of mind-control programs like the infamous MKUltra in the United States, but, there we are. We live and learn. I spent many years from 1996 to right across the millennium researching mind control in detail on both sides of the Atlantic and elsewhere. I met a large number of mind-control survivors and many had been held captive in body and mind by MKUltra. MK stands for mind-control, but employs the German spelling in deference to the Nazis spirited out of Germany at the end of World War Two by Operation Paperclip in which the US authorities, with help from the Vatican, transported Nazi mind-controllers and engineers to America to continue their work. Many of them were behind the creation of NASA and they included Nazi scientist and SS officer Wernher von Braun who swapped designing V-2 rockets to bombard London with designing the Saturn V rockets that powered the NASA moon programme's Apollo craft. I think I may have mentioned that the Cult has no borders. Among Paperclip escapees was Josef Mengele, the Angel of Death in the Nazi concentration camps where he conducted mind and genetic experiments on children often using twins to provide a control twin to measure the impact of his 'work' on the other. If you want to observe the Cult mentality in all its extremes of evil then look into the life of Mengele. I have met many people who suffered mercilessly under Mengele in the United States where he operated under the name Dr Greene and became a stalwart of MKUltra programming and torture. Among his locations was the underground facility in the Mojave Desert in California called the China Lake Naval Weapons Station which is almost entirely below the surface. My books *The Biggest Secret*, *Children of the Matrix* and *The Perception Deception* have the detailed background to MKUltra. The best-known MKUltra survivor is American Cathy O'Brien. I first met her and her late partner Mark Phillips at a conference in Colorado in 1996. Mark helped her escape and deprogram from decades of captivity in an

offshoot of MKUltra known as Project Monarch in which 'sex slaves' were provided for the rich and famous including Father George Bush, Dick Cheney and the Clintons. Read Cathy and Mark's book *Trance-Formation of America* and if you are new to this you will be shocked to the core. I read it in 1996 shortly before, with the usual synchronicity of my life, I found myself given a book table at the conference right next to hers. MKUltra never ended despite being very publicly exposed (only a small part of it) in the 1970s and continues in other guises. I am still in touch with Cathy. She contacted me during 2020 after masks became compulsory in many countries to tell me how they were used as part of MKUltra programming. I had been observing 'Covid regulations' and the relationship between authority and public for months. I saw techniques that I knew were employed on individuals in MKUltra being used on the global population. I had read many books and manuals on mind control including one called *Silent Weapons for Quiet Wars* which came to light in the 1980s and was a guide on how to perceptually program on a mass scale. 'Silent Weapons' refers to mind-control. I remembered a line from the manual as governments, medical authorities and law enforcement agencies have so obviously talked to – or rather at – the adult population since the 'Covid' hoax began as if they are children. The If a person is spoken to by a T.V. advertiser as if he were a twelve-year-old, then, due to suggestibility, he will, with a certain probability, respond or react to that suggestion with the uncritical response of a twelve-year-old and will reach in to his economic reservoir and deliver its energy to buy that product on impulse when he passes it in the store. That's why authority has spoken to adults like children since all this Why did Michael Jackson wear masks? Every aspect of the 'Covid' narrative has mind-control as its central theme. Cathy O'Brien wrote an article for [davidicke.com](http://davidicke.com) about the connection between masks and mind control. Her daughter Kelly who I first met in the 1990s was born while Cathy was still held captive in MKUltra. Kelly was forced to wear a mask as part of her programming from the age of two to dehumanise her, target her sense of individuality and reduce the amount of oxygen her brain and body received. Bingo. This is the real reason for compulsory masks, why they have been enforced en masse, and why they seek to increase the number they demand

you wear. First one, then two, with one disgraceful alleged 'doctor' recommending four which is nothing less than a death sentence. Where and how often they must be worn is being expanded for the purpose of mass mind control and damaging respiratory health which they can call 'Covid-19'. Canada's government headed by the man-child Justin Trudeau, says it's fine for children of two and older to wear masks. An insane 'study' in Italy involving just 47 children concluded there was no problem for babies as young as four months wearing them. Even after people were 'vaccinated' they were still told to wear masks by the criminal that is Anthony Fauci. Cathy wrote that mandating masks is allowing the authorities literally to control the air we breathe which is what was done in MKUltra. You might recall how the singer Michael Jackson wore masks and there is a reason for that. He was subjected to MKUltra mind control through Project Monarch and his psyche was scrambled by these simpletons. Cathy wrote: In MKUltra Project Monarch mind control, Michael Jackson had to wear a mask to silence his voice so he could not reach out for help. Remember how he developed that whisper voice when he wasn't singing? Masks control the mind from the outside in, like the redefining of beaten, for example, it ultimately controls thought that drives our words and ultimately actions (or lack thereof). Likewise, a mask muffles our speech so that we are not heard, which controls voice ... words ... mind. This is Mind Control. Masks are an obvious mind control device, and I am disturbed so many people are complying on a global scale. Masks depersonalize while making a person feel as though they have no voice. It is a barrier to others. People who would never choose to comply but are forced to wear a mask in order to keep their job, and ultimately their family fed, are compromised. They often feel shame and are subdued. People have stopped talking with each other while media controls the narrative. The 'no voice' theme has often become literal with train passengers told not to speak to each other in case they pass on the 'virus', singing banned for the same reason and bonkers California officials telling people riding roller coasters that they cannot shout and scream. Cathy said she heard every day from healed MKUltra survivors who cannot wear a mask without flashing back on ways their breathing was controlled – 'from ball gags and penises to

water boarding'. She said that through the years when she saw images of people in China wearing masks 'due to pollution' that it was really to control their oxygen levels. 'I knew it was as much of a population control mechanism of depersonalisation as are burkas', she said. Masks are another Chinese communist/fascist method of control that has been swept across the West as the West becomes China at lightning speed since we entered 2020. There are other reasons for mandatory masks and these include destroying respiratory health to call it 'Covid-19' and stunting brain development of children and the young. Dr Margarite Griesz-Brisson MD, PhD, is a Consultant Neurologist and Neurophysiologist and the Founder and Medical Director of the London Neurology and Pain Clinic. Her CV goes down the street and round the corner. She is clearly someone who cares about people and won't parrot the propaganda. Griesz-Brisson has a PhD in pharmacology, with special interest in neurotoxicology, environmental medicine, neuroregeneration and neuroplasticity (the way the brain can change in the light of information received). She went public in October, 2020, with a passionate warning about the effects of mask-wearing laws: The reinhalation of our exhaled air will without a doubt create oxygen deficiency and a flooding of carbon dioxide. We know that the human brain is very sensitive to oxygen deprivation. There are nerve cells for example in the hippocampus that can't be longer than 3 minutes without oxygen – they cannot survive. The acute warning symptoms are headaches, drowsiness, dizziness, issues in concentration, slowing down of reaction time – reactions of the cognitive system. Oh, I know, let's tell bus, truck and taxi drivers to wear them and people working machinery. How about pilots, doctors and police? Griesz-Brisson makes the important point that while the symptoms she mentions may fade as the body readjusts this does not alter the fact that people continue to operate in oxygen deficit with long list of potential consequences. She said it was well known that neurodegenerative diseases take years or decades to develop. 'If today you forget your phone number, the breakdown in your brain would have already started 20 or 30 years ago.' She said degenerative processes in your brain are geïjng amplified as your oxygen deprivation continues through wearing a mask. Nerve cells in the brain are unable to divide themselves

normally in these circumstances and lost nerve cells will no longer be regenerated. 'What is gone is gone.' Now consider that people like shop workers and schoolchildren are wearing masks for hours every day. What in the name of sanity is going to be happening to them? 'I do not wear a mask, I need my brain to think', Griesz-Brisson said, 'I want to have a clear head when I deal with my patients and not be in a carbon dioxide-induced anaesthesia'. If you are told to wear a mask anywhere ask the organisation, police, store, whatever, for their risk assessment on the dangers and negative effects on mind and body of enforcing mask-wearing. They won't have one because it has never been done not even by government. All of them must be subject to class-action lawsuits as the consequences come to light. They don't do mask risk assessments for an obvious reason. They know what the conclusions would be and independent scientific studies that have been done tell a horror story of consequences. 'Masks are criminal' Dr Griesz-Brisson said that for children and adolescents, masks are an absolute no-no. They had an extremely active and adaptive immune system and their brain was incredibly active with so much to learn. 'The child's brain, or the youth's brain, is thirsting for oxygen.' The more metabolically active an organ was, the more oxygen it required; and in children and adolescents every organ was metabolically active. Griesz-Brisson said that to deprive a child's or adolescent's brain of oxygen, or to restrict it in any way, was not only dangerous to their health, it was absolutely criminal. 'Oxygen deficiency inhibits the development of the brain, and the damage that has taken place as a result CANNOT be reversed.' Mind manipulators of MKUltra put masks on two-year-olds they wanted to neurologically rewire and you can see why. Griesz-Brisson said a child needs the brain to learn and the brain needs oxygen to function. 'We don't need a clinical study for that. This is simple, indisputable physiology.' Consciously and purposely induced oxygen deficiency was an absolutely deliberate health hazard, and an absolute medical contraindication which means that 'this drug, this therapy, this method or measure should not be used, and is not allowed to be used'. To coerce an entire population to use an absolute medical contraindication by force, she said, there had to be definite and serious reasons and the reasons must be presented to

competent interdisciplinary and independent bodies to be verified and authorised. She had this warning of the consequences that were coming if mask wearing continued: When, in ten years, dementia is going to increase exponentially, and the younger generations couldn't reach their god-given potential, it won't help to say 'we didn't need the masks'. I know how damaging oxygen deprivation is for the brain, cardiologists know how damaging it is for the heart, pulmonologists know how damaging it is for the lungs. Oxygen deprivation damages every single organ. Where are our health departments, our health insurance, our medical associations? It would have been their duty to be vehemently against the lockdown and to stop it and stop it from the very beginning. Why do the medical boards issue punishments to doctors who give people exemptions? Does the person or the doctor seriously have to prove that oxygen deprivation harms people? What kind of medicine are our doctors and medical associations representing? Who is responsible for this crime? The ones who want to enforce it? The ones who let it happen and play along, or the ones who don't prevent it? All of the organisations and people she mentions there either answer directly to the Cult or do whatever hierarchical levels above them tell them to do. The outcome of both is the same. 'It's not about masks, it's not about viruses, it's certainly not about your health', Griesz-Brisson said. 'It is about much, much more. I am not participating. I am not afraid.' They were taking our air to breathe and there was no unfounded medical exemption from face masks. Oxygen deprivation was dangerous for every single brain. It had to be the free decision of every human being whether they want to wear a mask that was absolutely ineffective to protect themselves from a virus. She ended by rightly identifying where the responsibility lies for all this: The imperative of the hour is personal responsibility. We are responsible for what we think, not the media. We are responsible for what we do, not our superiors. We are responsible for our health, not the World Health Organization. And we are responsible for what happens in our country, not the government. But surgeons wear masks, right? Independent studies of mask-wearing have produced a long list of reports detailing mental, emotional and physical dangers. What a definition of insanity to see police officers imposing

mask-wearing on the public which will cumulatively damage their health while the police themselves wear masks that will cumulatively damage their health. It's utter madness and both public and police do this because 'the government says so' – yes a government of brain-donor idiots like UK Health Secretary Matt Hancock reading the 'follow the science' scripts of psychopathic, lunatic psychologists. The response you get from Stockholm syndrome sufferers defending the very authorities that are destroying them and their families is that 'surgeons wear masks'. This is considered the game, set and match that they must work and don't cause oxygen deficit. Well, actually, scientific studies have shown that they do and oxygen levels are monitored in operating theatres to compensate. Surgeons wear masks to stop spittle and such like dropping into open wounds – not to stop 'viral particles' which are so miniscule they can only be seen through an electron microscope. Holes in the masks are significantly bigger than 'viral particles' and if you sneeze or cough they will breach the mask. I watched an incredibly disingenuous 'experiment' that claimed to prove that masks work in catching 'virus' material from the mouth and nose. They did this with a slow motion camera and the mask did block big stuff which stayed inside the mask and against the face to be breathed in or cause infections on the face as we have seen with many children. 'Viral particles', however, would never have been picked up by the camera as they came through the mask when they are far too small to be seen. The 'experiment' was therefore disingenuous and useless. Studies have concluded that wearing masks in operating theatres (and thus elsewhere) make no difference to preventing infection while the opposite is true with toxic shite building up in the mask and this had led to an explosion in tooth decay and gum disease dubbed by dentists 'mask mouth'. You might have seen the Internet video of a furious American doctor urging people to take off their masks after a four-year-old patient had been rushed to hospital the night before and nearly died with a lung infection that doctors sourced to mask wearing. A study in the journal Cancer Discovery found that inhalation of harmful microbes can contribute to advanced stage lung cancer in adults and long-term use of masks can help breed dangerous pathogens. Microbiologists have said frequent mask wearing creates a moist environment in which



microbes can grow and proliferate before entering the lungs. The Canadian Agency for Drugs and Technologies in Health, or CADTH, a Canadian national organisation that provides research and analysis to healthcare decision-makers, said this as long ago as 2013 in a report entitled 'Use of Surgical Masks in the Operating Room: A Review of the Clinical Effectiveness and Guidelines'. It said: No evidence was found to support the use of surgical face masks to reduce the frequency of surgical site infections No evidence was found on the effectiveness of wearing surgical face masks to protect staff from infectious material in the Guidelines recommend the use of surgical face masks by staff in the operating room to protect both operating room staff and patients (despite the lack of evidence). We were told that the world could go back to 'normal' with the arrival of the 'vaccines'. When they came, fraudulent as they are, the story changed as I knew that it would. We are in the midst of transforming 'normal', not going back to it. Mary Ramsay, head of immunisation at Public Health England, echoed the words of US criminal Anthony Fauci who said masks and other regulations must stay no matter if people are vaccinated. The Fauci idiot continued to wear two masks – different colours so both could be clearly seen – after he claimed to have been vaccinated. Senator Rand Paul told Fauci in one exchange that his double-masks were 'theatre' and he was right. It's all theatre. Mary Ramsay back-tracked on the vaccine- return-to-normal theme when she said the public may need to wear masks and social-distance for years despite the jabs. 'People have got used to those lower-level restrictions now, and [they] can live with them', she said telling us what the idea has been all along. 'The vaccine does not give you a pass, even if you have had it, you must continue to follow all the guidelines' said a Public Health England statement which reneged on what we had been told before and made having the 'vaccine' irrelevant to 'normality' even by the official story. Spain's fascist government trumped everyone by passing a law mandating the wearing of masks on the beach and even when swimming in the sea. The move would have devastated what's left of the Spanish tourist industry, posed potential breathing dangers to swimmers and had Northern European sunbathers walking around with their forehead brown and the rest of their face white as a sheet. The ruling was so crazy that it

had to be retracted after pressure from public and tourist industry, but it confirmed where the Cult wants to go with masks and how clinically insane authority has become. The determination to make masks permanent and hide the serious dangers to body and mind can be seen in the censorship of scientist Professor Denis Rancourt by Bill Gates- funded academic publishing website ResearchGate over his papers exposing the dangers and uselessness of masks. Rancourt said: ResearchGate today has permanently locked my account, which I have had since 2015. Their reasons graphically show the nature of their attack against democracy, and their corruption of science ... By their obscene non-logic, a scientific review of science articles reporting on harms caused by face masks has a 'potential to cause harm'. No criticism of the psychological device (face masks) is tolerated, if the said criticism shows potential to influence public policy. This is what happens in a fascist world. Where are the 'greens' (again)? Other dangers of wearing masks especially regularly relate to the inhalation of minute plastic fibres into the lungs and the deluge of discarded masks in the environment and oceans. Estimates predicted that more than 1.5 billion disposable masks will end up in the world's oceans every year polluting the water with tons of plastic and endangering marine wildlife. Studies project that humans are using 129 billion face masks each month worldwide – about three million a minute. Most are disposable and made from plastic, non- biodegradable microfibers that break down into smaller plastic particles that become widespread in ecosystems. They are littering cities, clogging sewage channels and turning up in bodies of water. I have written in other books about the immense amounts of microplastics from endless sources now being absorbed into the body. Rolf Halden, director of the Arizona State University (ASU) Biodesign Center for Environmental Health Engineering, was the senior researcher in a 2020 study that analysed 47 human tissue samples and found microplastics in all of them. 'We have detected these chemicals of plastics in every single organ that we have investigated', he said. I wrote in The Answer about the world being deluged with microplastics. A study by the Worldwide Fund for Nature (WWF) found that people are consuming on average every week some 2,000 tiny pieces of plastic mostly through water and also through

marine life and the air. Every year humans are ingesting enough microplastics to fill a heaped dinner plate and in a life-time of 79 years it is enough to fill two large waste bins. Marco Lambertini, WWF International director general said: 'Not only are plastics polluting our oceans and waterways and killing marine life – it's in all of us and we can't escape consuming plastics,' American geologists found tiny plastic fibres, beads and shards in rainwater samples collected from the remote slopes of the Rocky Mountain National Park near Denver, Colorado. Their report was headed: 'It is raining plastic.' Rachel Adams, senior lecturer in Biomedical Science at Cardiff Metropolitan University, said that among health consequences are internal inflammation and immune responses to a 'foreign body'. She further pointed out that microplastics become carriers of toxins including mercury, pesticides and dioxins (a known cause of cancer and reproductive and developmental problems). These toxins accumulate in the fatty tissues once they enter the body through microplastics. Now this is being compounded massively by people putting plastic on their face and throwing it away. Workers exposed to polypropylene plastic fibres known as 'flock' have developed 'flock worker's lung' from inhaling small pieces of the flock fibres which can damage lung tissue, reduce breathing capacity and exacerbate other respiratory problems. Now ... commonly used surgical masks have three layers of melt-blown textiles made of ... polypropylene. We have billions of people putting these microplastics against their mouth, nose and face for hours at a time day after day in the form of masks. How does anyone think that will work out? I mean – what could possibly go wrong? We posted a number of scientific studies on this at [davidicke.com](http://davidicke.com), but when I went back to them as I was writing this book the links to the science research website where they were hosted were dead. Anything that challenges the official narrative in any way is either censored or vilified. The official narrative is so unsupportable by the evidence that only deleting the truth can protect it. A study by Chinese scientists still survived – with the usual twist which is why it was still active, I guess. Yes, they found that virtually all the masks they tested increased the daily intake of microplastic fibres, but people should still wear them because the danger from the 'virus' was worse said the crazy 'team' from the Institute of

Hydrobiology in Wuhan. Scientists first discovered microplastics in lung tissue of some patients who died of lung cancer in the 1990s. Subsequent studies have confirmed the potential health damage with the plastic degrading slowly and remaining in the lungs to accumulate in volume. Wuhan researchers used a machine simulating human breathing to establish that masks shed up to nearly 4,000 microplastic fibres in a month with reused masks producing more. Scientists said some masks are laced with toxic chemicals and a variety of compounds seriously restricted for both health and environmental reasons. They include cobalt (used in blue dye) and formaldehyde known to cause watery eyes, burning sensations in the eyes, nose, and throat, plus coughing, wheezing and nausea. No – that must be 'Covid-19'. There is another and potentially even more sinister content of masks. Mostly new masks of different makes filmed under a microscope around the world have been found to contain strange black fibres or 'worms' that appear to move or 'crawl' by themselves and react to heat and water. The nearest I have seen to them are the self-replicating fibres that are pulled out through the skin of those suffering from Morgellons disease which has been connected to the phenomena of 'chemtrails' which I will bring into the story later on. Morgellons fibres continue to grow outside the body and have a form of artificial intelligence. Black 'worm' fibres in masks have that kind of feel to them and there is a nanotechnology technique called 'worm micelles' which carry and release drugs or anything else you want to deliver to the body. For sure the suppression of humanity by mind altering drugs is the Cult agenda big time and the more excuses they can find to gain access to the body the more opportunities there are to make that happen whether through 'vaccines' or masks pushed against the mouth and nose for hours on So let us summarise the pros and cons of masks:

Against masks: Breathing in your own carbon dioxide; depriving the body and brain of sufficient oxygen; build-up of toxins in the mask that can be breathed into the lungs and cause rashes on the face and 'mask-mouth'; breathing microplastic fibres and toxic chemicals into the lungs; dehumanisation and deleting individualisation by literally making people faceless; destroying human emotional interaction through facial expression and deleting parental

connection with their babies which look for guidance to their facial expression. For masks: They don't protect you from a 'virus' that doesn't exist and even if it did 'viral' particles are so minute they are smaller than the holes in the mask. Governments, police, supermarkets, businesses, transport companies, and all the rest who seek to impose masks have done no risk assessment on their consequences for health and psychology and are now open to group lawsuits when the impact becomes clear with a cumulative epidemic of respiratory and other disease. Authorities will try to exploit these effects and hide the real cause by dubbing them 'Covid-19'. Can you imagine seĵing out to force the assessment of the risks? It is criminal and it is evil, but then how many people targeted in this way, who see their children told to wear them all day at school, have asked for a risk assessment? Billions can't be imposed upon by the few unless the billions allow it. Oh, yes, with just a tinge of irony, 85 percent of all masks made worldwide come from China. Wash your hands in toxic shite 'Covid' rules include the use of toxic sanitisers and again the health consequences of constantly applying toxins to be absorbed through the skin is obvious to any level of Renegade Mind. America's Food and Drug Administration (FDA) said that sanitisers are drugs and issued a warning about 75 dangerous brands which contain methanol used in antifreeze and can cause death, kidney damage and blindness. The FDA circulated the following warning even for those brands that it claims to be safe: Store hand sanitizer out of the reach of pets and children, and children should use it only with adult supervision. Do not drink hand sanitizer. This is particularly important for young children, especially toddlers, who may be attracted by the pleasant smell or brightly colored bottles of hand sanitizer. Drinking even a small amount of hand sanitizer can cause alcohol poisoning in children. (However, there is no need to be concerned if your children eat with or lick their hands after using hand sanitizer.) During this coronavirus pandemic, poison control centers have had an increase in calls about accidental ingestion of hand sanitizer, so it is important that adults monitor young children's use. Do not allow pets to swallow hand sanitizer. If you think your pet has eaten something potentially dangerous, call your veterinarian or a pet poison control center right away. Hand sanitizer is flammable and should

be stored away from heat and flames. When using hand sanitizer, rub your hands until they feel completely dry before performing activities that may involve heat, sparks, static electricity, or open flames. There you go, perfectly safe, then, and that's without even a mention of the toxins absorbed through the skin. Come on kids – sanitise your hands everywhere you go. It will save you from the 'virus'. Put all these elements together of the 'Covid' normal and see how much health and psychology is being cumulatively damaged, even devastated, to 'protect your health'. Makes sense, right? They are only imposing these things because they care, right? Right? Submitting to insanity Psychological reframing of the population goes very deep and is done in many less obvious ways. I hear people say how contradictory and crazy 'Covid' rules are and how they are ever changing. This is explained away by dismissing those involved as idiots. It is a big mistake. The Cult is delighted if its cold calculation is perceived as incompetence and idiocy when it is anything but. Oh, yes, there are idiots within the system – lots of them – but they are administering the Cult agenda, mostly unknowingly. They are not deciding and dictating it. The bulwark against tyranny is self-respect, always has been, always will be. It is self-respect that has broken every tyranny in history. By its very nature self-respect will not bow to oppression and its perpetrators. There is so little self-respect that it's always the few that overturn dictators. Many may eventually follow, but the few with the iron spines (self-respect) kick it off and generate the momentum. The Cult targets self-respect in the knowledge that once this has gone only submission remains. Crazy, contradictory, ever-changing 'Covid' rules are systematically applied by psychologists to delete self-respect. They want you to see that the rules make no sense. It is one thing to decide to do something when you have made the choice based on evidence and logic. You still retain your self-respect. It is quite another when you can see what you are being told to do is insane, ridiculous and makes no sense, and yet you still do it. Your self-respect is extinguished and this has been happening as ever more obviously stupid and nonsensical things have been demanded and the great majority have complied even when they can see they are stupid and People walk around in face-nappies knowing they are damaging their health and make no difference to a

'virus'. They do it in fear of happens something dies inside of you and submissive reframing has begun. Next there's a need to hide from yourself that you have conceded your self-respect and you convince yourself that you have not really submitted to fear and intimidation. You begin to believe that you are complying with craziness because it's the right thing to do. When first you concede your self-respect of  $2+2 = 4$  to  $2+2 = 5$  you know you are compromising your self-respect. Gradually to avoid facing that fact you begin to believe that  $2+2=5$ . You have been reframed and I have been watching this process happening in the human psyche on an industrial scale. The Cult is working to break your spirit and one of its major tools in that war is humiliation. I read how former American soldier Bradley Manning (later Chelsea Manning after a sex-change) was treated after being jailed for supplying WikiLeaks with documents exposing the enormity of government and elite mendacity. Manning was isolated in solitary confinement for eight months, put under 24-hour surveillance, forced to hand over clothing before going to bed, and stand naked for every roll call. This is systematic humiliation. The introduction of anal swab 'Covid' tests in China has been done for the same reason to delete self-respect and induce compliant submission. Anal swabs are mandatory for incoming passengers in parts of China and American diplomats have said they were forced to undergo the indignity which would have been calculated humiliation by the Cult-owned Chinese government that has America in its sights. Government-people: An abusive relationship

Spirit-breaking psychological techniques include giving people hope and apparent respite from tyranny only to take it away again. This happened in the UK during Christmas, 2020, when the psycho- psychologists and their political lackeys announced an easing of restrictions over the holiday only to reimpose them almost immediately on the basis of yet another lie. There is a big psychological difference between giving used to oppression and being given hope of relief only to have that dashed. Psychologists know this and we have seen the technique used repeatedly. Then there is traumatising people before you introduce more extreme regulations that require compliance. A perfect case was the announcement by the dark and sinister Whitty and Vallance in the UK that 'new data' predicted that 4,000 could die

every day over the winter of 2020/2021 if we did not lockdown again. I think they call it lying and after traumatising people with that claim out came Jackboot Johnson the next day with new curbs on human freedom. Psychologists know that a frightened and traumatised mind becomes suggestable to submission and behaviour reframing. Underpinning all this has been to make people fearful and suspicious of each other and see themselves as a potential danger to others. In league with deleted self-respect you have the perfect psychological recipe for self-loathing. The relationship between authority and public is now demonstrably the same as that of subservience to an abusive partner. These are signs of an abusive relationship explained by psychologist Leslie Becker-Phelps: Psychological and emotional abuse: Undermining a partner's self-worth with verbal attacks, name-calling, and belittling. Humiliating the partner in public, unjustly accusing them of having an affair, or interrogating them about their every behavior. Keeping partner confused or off balance by saying they were just kidding or blaming the partner for 'making' them act this way ... Feigning in public that they care while turning against them in private. This leads to victims frequently feeling confused, incompetent, unworthy, hopeless, and chronically self-doubting. [Apply these techniques to how governments have treated the population since New Year, 2020, and the parallels are obvious.] Physical abuse: The abuser might physically harm their partner in a range of ways, such as grabbing, hitting, punching, or shoving them. They might throw objects at them or harm them with a weapon. [Observe the physical harm imposed by masks, lockdown, and so on.] Threats and intimidation: One way abusers keep their partners in line is by instilling fear. They might be verbally threatening, or give threatening looks or gestures. Abusers often make it known that they are tracking their partner's every move. They might destroy their partner's possessions, threaten to harm them, or threaten to harm their family members. Not surprisingly, victims of this abuse often feel anxiety, fear, and panic. [No words necessary.] Isolation: Abusers often limit their partner's activities, forbidding them to talk or interact with friends or family. They might limit access to a car or even turn off their phone. All of this might be done by physically holding them against their will, but is often accomplished through



psychological abuse and intimidation. The more isolated a person feels, the fewer resources they have to help gain perspective on their situation and to escape from it. [No words

Economic abuse: Abusers often make their partners beholden to them for money by controlling access to funds of any kind. They might prevent their partner from getting a job or withhold access to money they earn from a job. This creates financial dependency that makes leaving the relationship very difficult. [See destruction of livelihoods and the proposed meagre 'guaranteed income' so long as you do whatever you are told.] Using children: An abuser might disparage their partner's parenting skills, tell their children lies about their partner, threaten to take custody of their children, or threaten to harm their children. These tactics instil fear and often elicit compliance. [See reframed social service mafia and how children are being mercilessly abused by the state over 'Covid' while their parents look on too frightened to do anything.] A further recurring trait in an abusive relationship is the abused blaming themselves for their abuse and making excuses for the abuser. We have the public blaming each other for lockdown abuse by government and many making excuses for the government while attacking those who challenge the government. How often we have heard authorities say that rules are being imposed or reimposed only because people have refused to 'behave' and follow the rules. We don't want to do it – it's you. Renegade Minds are an antidote to all of these things. They will never concede their self-respect no matter what the circumstances. Even when apparent humiliation is heaped upon them they laugh in its face and reflect back the humiliation on the abuser where it belongs. Renegade Minds will never wear masks they know are only imposed to humiliate, suppress and damage both physically and psychologically. Consequences will take care of themselves and they will never break their spirit or cause them to concede to tyranny. UK newspaper columnist Peter Hitchens was one of the few in the mainstream media to speak out against lockdowns and forced vaccinations. He then announced he had taken the jab. He wanted to see family members abroad and he believed vaccine passports were inevitable even though they had not yet been introduced. Hitchens has a questioning and critical mind, but not a Renegade one. If he had no amount of pressure

would have made him concede. Hitchens excused his action by saying that the battle has been lost. Renegade Minds never accept defeat when freedom is at stake and even if they are the last one standing the self-respect of not submitting to tyranny is more important than any outcome or any consequence. That's why Renegade Minds are the only minds that ever changed anything worth changing. Insanity is relative. It depends on who has who locked in what cage. Reframing a mind means simply to change its perception and behaviour. This can be done subconsciously to such an extent that subjects have no idea they have been 'reframed' while to any observer changes in behaviour and attitudes are obvious. Human society is being reframed on a ginormous scale since the start of 2020 and here we have the reason why psychologists rather than doctors have been calling the shots. Ask most people who have succumbed to 'Covid' reframing if they have changed and most will say 'no'; but they have and fundamentally. The Cult's long-game has been preparing for these times since way back and crucial to that has been to prepare both population and officialdom mentally and emotionally. To use the mind-control parlance they had to reframe the population with a mentality that would submit to fascism and reframe those in government and law enforcement to impose fascism or at least go along with it. The result has been the fact- deleted mindlessness of 'Wokeness' and officialdom that has either enthusiastically or unquestioningly imposed global tyranny demanded by reframed politicians on behalf of psychopathic and deeply evil cultists. 'Cognitive reframing' identifies and challenges the way someone sees the world in the form of situations, experiences and emotions and then restructures those perceptions to view the same set of circumstances in a different way. This can have benefits if the attitudes are personally destructive while on the other side it has the potential for individual and collective mind control which the subject has no idea has even happened. Cognitive therapy was developed in the 1960s by Aaron T. Beck who was born in Rhode Island in 1921 as the son of Jewish immigrants from the Ukraine. He became interested in the techniques as a treatment for depression. Beck's daughter Judith S. Beck is prominent in the same field and they founded the Beck Institute for Cognitive Behavior Therapy in Philadelphia in 1994. Cognitive reframing,

however, began to be used worldwide by those with a very dark agenda. The Cult reframes politicians to change their attitudes and actions until they are completely at odds with what they once appeared to stand for. The same has been happening to government administrators at all levels, law enforcement, military and the human population. Cultists love mind control for two main reasons: It allows them to control what people think, do and say to secure agenda advancement and, by definition, it calms their legendary insecurity and fear of the unexpected. I have studied mind control since the time I travelled America in 1996. I may have been talking to next to no one in terms of an audience in those years, but my goodness did I gather a phenomenal amount of information and knowledge about so many things including the techniques of mind control. I have described this in detail in other books going back to *The Biggest Secret* in 1998. I met a very large number of people recovering from MKUltra and its offshoots and successors and I began to see how these same techniques were being used on the population in general. This was never more obvious than since the 'Covid' hoax began. Reframing the enforcers I have observed over the last two decades and more the very clear transformation in the dynamic between the police, officialdom and the public. I tracked this in the books as the relationship mutated from one of serving the public to seeing them as almost the enemy and certainly a lower caste. There has always been a class divide based on income and always been some psychopathic, corrupt, and big-I-am police officers. This was different. Wholesale change was unfolding in the collective dynamic; it was less about money and far more about position and perceived power. An us-and-them was emerging. Noses were lifted skyward by government administration and law enforcement and their attitude to the public they were supposed to be serving changed to one of increasing contempt, superiority and control. The transformation was so clear and widespread that it had to be planned. Collective attitudes and dynamics do not change naturally and organically that quickly on that scale. I then came across an organisation in Britain called Common Purpose created in the late 1980s by Julia Middleton who would work in the office of Deputy Prime Minister John Prescott during the long and disastrous premiership of war criminal Tony Blair.

When Blair speaks the Cult is speaking and the man should have been in jail a long time ago. Common Purpose proclaims itself to be one of the biggest 'leadership development' organisations in the world while functioning as a charity with all the financial benefits which come from that. It hosts 'leadership development' courses and programmes all over the world and claims to have 'brought together' what it calls 'leaders' from more than 100 countries on six continents. The modus operandi of Common Purpose can be compared with the work of the UK government's reframing network that includes the Behavioural Insights Team 'nudge unit' and 'Covid' reframing specialists at SPI-B. WikiLeaks described Common Purpose long ago as 'a hidden virus in our government and schools' which is unknown to the general public: 'It recruits and trains "leaders" to be loyal to the directives of Common Purpose and the EU, instead of to their own departments, which they then undermine or subvert, the NHS [National Health Service] being an example.' This is a vital point to understand the 'Covid' hoax. The NHS, and its equivalent around the world, has been utterly reframed in terms of administrators and much of the medical personnel with the transformation underpinned by recruitment policies. The outcome has been the criminal and psychopathic behaviour of the NHS over 'Covid' and we have seen the same in every other major country. WikiLeaks said Common Purpose trainees are 'learning to rule without regard to democracy' and to usher in a police state (current events explained). Common Purpose operated like a 'glue' and had members in the NHS, BBC, police, legal profession, church, many of Britain's 7,000 quangos, local councils, the Civil Service, government ministries and Parliament, and controlled many RDA's (Regional Development Agencies). Here we have one answer for how and why British institutions and their like in other countries have changed so negatively in relation to the public. This further explains how and why the beyond-disgraceful reframed BBC has become a propaganda arm of 'Covid' fascism. They are all part of a network pursuing the same goal. By 2019 Common Purpose was quoting a figure of 85,000 'leaders' that had attended its programmes. These 'students' of all ages are known as Common Purpose 'graduates' and they consist of government, state and local government officials and administrators, police chiefs

and officers, and a whole range of others operating within the national, local and global establishment. Cressida Dick, Commissioner of the London Metropolitan Police, is the Common Purpose graduate who was the 'Gold Commander' that oversaw what can only be described as the murder of Brazilian electrician Jean Charles de Menezes in 2005. He was held down by psychopathic police and shot seven times in the head by a psychopathic lunatic aĝer being mistaken for a terrorist when he was just a bloke going about his day. Dick authorised officers to pursue and keep surveillance on de Menezes and ordered that he be stopped from entering the underground train system. Police psychopaths took her at her word clearly. She was 'disciplined' for this outrage by being promoted – eventually to the top of the 'Met' police where she has been a disaster. Many Chief Constables controlling the police in different parts of the UK are and have been Common Purpose graduates. I have heard the 'graduate' network described as a sort of Mafia or secret society operating within the fabric of government at all levels pursuing a collective policy ingrained at Common Purpose training events. Founder Julia Middleton herself has said: Locally and internationally, Common Purpose graduates will be 'lighting small fires' to create change in their organisations and communities ... The Common Purpose effect is best illustrated by the many stories of small changes brought about by leaders, who themselves A Common Purpose mission statement declared: Common Purpose aims to improve the way society works by expanding the vision, decision-making ability and influence of all kinds of leaders. The organisation runs a variety of educational programmes for leaders of all ages, backgrounds and sectors, in order to provide them with the inspirational, information and opportunities they need to change the world. Yes, but into what? Since 2020 the answer has become clear. NLP and the Delphi technique Common Purpose would seem to be a perfect name or would common programming be beĝer? One of the foundation methods of reaching 'consensus' (group think) is by seĝing the agenda theme and then encouraging, cajoling or pressuring everyone to agree a 'consensus' in line with the core theme promoted by Common Purpose. The methodology involves the 'Delphi technique', or an adaption of it, in which opinions are expressed that are summarised

by a 'facilitator or change agent' at each stage. Participants are 'encouraged' to modify their views in the light of what others have said. Stage by stage the former individual opinions are merged into group consensus which just happens to be what Common Purpose wants them to believe. A key part of this is to marginalise anyone refusing to concede to group think and turn the group against them to apply pressure to conform. We are seeing this very technique used on the general population to make 'Covid' group-thinkers hostile to those who have seen through the bullshit. People can be reframed by using perception manipulation methods such as Neuro-Linguistic Programming (NLP) in which you change perception with the use of carefully constructed language. An NLP website described the technique this way: ... A method of influencing brain behaviour (the 'neuro' part of the phrase) through the use of language (the 'linguistic' part) and other types of communication to enable a person to 'recode' the way the brain responds to stimuli (that's the 'programming') and manifest new and better behaviours. Neuro-Linguistic Programming often incorporates hypnosis and self-hypnosis to help achieve the change (or 'programming') that is wanted. British alternative media operation UKColumn has done very detailed research into Common Purpose over a long period. I quoted co-founder and former naval officer Brian Gerrish in my book *Remember Who You Are*, published in 2011, as saying the following years before current times: It is interesting that many of the mothers who have had children taken by the State speak of the Social Services people being icily cool, emotionless and, as two ladies said in slightly different words, '... like little robots'. We know that NLP is cumulative, so people can be given small imperceptible doses of NLP in a course here, another in a few months, next year etc. In this way, major changes are accrued in their personality, but the day by day change is In these and other ways 'graduates' have had their perceptions uniformly reframed and they return to their roles in the institutions of government, law enforcement, legal profession, military, 'education', the UK National Health Service and the whole swathe of the establishment structure to pursue a common agenda preparing for the 'post-industrial', 'post-democratic' society. I say 'preparing' but we are now there. 'Post-industrial' is code for the Great Reset and 'post-democratic' is

'Covid' fascism. UKColumn has spoken to partners of those who have attended Common Purpose 'training'. They have described how personalities and attitudes of 'graduates' changed very noticeably for the worse by the time they had completed the course. They had been 'reframed' and told they are the 'leaders' – the special ones – who know better than the population. There has also been the very demonstrable recruitment of psychopaths and narcissists into government administration at all levels and law enforcement. If you want psychopathy hire psychopaths and you get a simple cause and effect. If you want administrators, police officers and 'leaders' to perceive the public as lesser beings who don't matter then employ narcissists. These personalities are identified using 'psychometrics' that identifies knowledge, abilities, attitudes and personality traits, mostly through carefully-designed questionnaires and tests. As this policy has passed through the decades we have had power-crazy, power-trippers appointed into law enforcement, security and government administration in preparation for current times and the dynamic between public and law enforcement/officialdom has been transformed. UKColumn's Brian Gerrish said of the narcissistic Their love of themselves and power automatically means that they will crush others who get in their way. I received a major piece of the puzzle when a friend pointed out that when they made public officials re-apply for their own jobs several years ago they were also required to do psychometric tests. This was undoubtedly the start of the screening process to get 'their' sort of people in post. How obvious that has been since 2020 although it was clear what was happening long before if people paid attention to the changing At the centre of events in 'Covid' Britain is the National Health Service (NHS) which has behaved disgracefully in slavishly following the Cult agenda. The NHS management structure is awash with Common Purpose graduates or 'change agents' working to a common cause. Helen Bevan, a Chief of Service Transformation at the NHS Institute for Innovation and Improvement, co-authored a document called 'Towards a million change agents, a review of the social movements literature: implications for large scale change in the NHS'. The document compared a project management approach to that of change and social

movements where 'people change themselves and each other – peer to peer'. Two definitions given for a 'social movement' were: A group of people who consciously attempt to build a radically new social order; involves people of a broad range of social backgrounds; and deploys politically confrontational and socially disruptive tactics – Cyrus Collective challenges, based on common purposes and social solidarities, in sustained interaction with elites, opponents, and authorities – Sidney Helen Bevan wrote another NHS document in which she defined 'framing' as 'the process by which leaders construct, articulate and put across their message in a powerful and compelling way in order to win people to their cause and call them to action'. I think I could come up with another definition that would be rather more accurate. The National Health Service and institutions of Britain and the wider world have been taken over by reframed 'change agents' and that includes everything from the United Nations to national governments, local councils and social services which have been kidnapping children from loving parents on an extraordinary and gathering scale on the road to the end of parenthood altogether. Children from loving homes are stolen and kidnapped by the state and put into the 'care' (inversion) of the local authority through council homes, foster parents and forced adoption. At the same time children are allowed to be abused without response while many are under council 'care'. UKColumn highlighted the Common Purpose connection between South Yorkshire Police and Rotherham council officers in the case of the scandal in that area of the sexual exploitation of children to which the authorities turned not one blind eye, but both: We were alarmed to discover that the Chief Executive, the Strategic Director of Children and Young People's Services, the Manager for the Local Strategic Partnership, the Community Cohesion Manager, the Cabinet Member for Cohesion, the Chief Constable and his predecessor had all attended Leadership training courses provided by the pseudo-charity Once 'change agents' have secured positions of hire and fire within any organisation things start to move very quickly. Personnel are then hired and fired on the basis of whether they will work towards the agenda the change agent represents. If they do they are rapidly promoted even though they may be incompetent. Those more qualified and skilled who are



pre-Common Purpose 'old school' see their careers stall and even disappear. This has been happening for decades in every institution of state, police, 'health' and social services and all of them have been transformed as a result in their attitudes to their jobs and the public. Medical professions, including nursing, which were once vocations for the caring now employ many cold, callous and couldn't give a shit personality types. The UKColumn investigation concluded: By blurring the boundaries between people, professions, public and private sectors, responsibility and accountability, Common Purpose encourages 'graduates' to believe that as new selected leaders, they can work together, outside of the established political and social structures, to achieve a paradigm shift or CHANGE – so called 'Leading Beyond Authority'. In Reframing the Face-Nappies Nowhere has this process been more obvious than in the police where recruitment of psychopaths and development of unquestioning mind-controlled group-thinkers have transformed law enforcement into a politically-correct 'Woke' joke and a travesty of what should be public service. Today they wear their face-nappies like good little gofers and enforce 'Covid' rules which are fascism under another name. Alongside the specifically-recruited psychopaths we have software minds incapable of free thought. Brian Gerrish again: An example is the policeman who would not get on a bike for a press photo because he had not done the cycling proficiency course. Normal people say this is political correctness gone mad. Nothing could be further from the truth. The policeman has been reframed, and in his reality it is perfect common sense not to get on the bike 'because he hasn't done the cycling Another example of this is where the police would not rescue a boy from a pond until they had taken advice from above on the 'risk assessment'. A normal person would have arrived, perhaps thought of the risk for a moment, and dived in. To the police now 'reframed', they followed 'normal' procedure. same. Sheer unthinking stupidity of London Face-Nappies headed by Common Purpose graduate Cressida Dick can be seen in their behaviour at a vigil in March, 2021, for a murdered woman, Sarah Everard. A police officer had been charged with the crime. Anyone with a brain would have led the vigil alone in the circumstances. Instead they 'manhandled' women to stop them breaking 'Covid rules' to

betray classic reframing. Minds in the thrall of perception control have no capacity for seeing a situation on its merits and acting accordingly. 'Rules is rules' is their only mind-set. My father used to say that rules and regulations are for the guidance of the intelligent and the blind obedience of the idiot. Most of the intelligent, decent, coppers have gone leaving only the other kind and a few old school for whom the job must be a daily nightmare. The combination of psychopaths and rule-book software minds has been clearly on public display in the 'Covid' era with automaton robots in uniform imposing fascistic 'Covid' regulations on the population without any personal initiative or judging situations on their merits. There are thousands of examples around the world, but I'll make my point with the infamous Derbyshire police in the English East Midlands – the ones who think pouring dye into beauty spots and using drones to track people walking in the countryside away from anyone is called 'policing'. To them there are rules decreed by the government which they have to enforce and in their bewildered state a group gathering in a closed space and someone walking alone in the countryside are the same thing. It is beyond idiocy and enters the realm of clinical insanity. Police officers in Derbyshire said they were 'horrified' – horrified – to find 15 to 20 'irresponsible' kids playing a football match at a closed leisure centre 'in breach of coronavirus restrictions'. When they saw the police the kids ran away leaving their belongings behind and the reframed men and women of Derbyshire police were seeking to establish their identities with a view to fining their parents. The most natural thing for youngsters to do – kicking a ball about – is turned into a criminal activity and enforced by the moronic software programs of Derbyshire police. You find the same mentality in every country. These barely conscious 'horrified' officers said they had to take action because 'we need to ensure these rules are being followed' and 'it is of the utmost importance that you ensure your children are following the rules and regulations for Covid-19'. Had any of them done ten seconds of research to see if this parroting of their masters' script could be supported by any evidence? Nope. Reframed people don't think – others think for them and that's the whole idea of reframing. I have seen police officers one after the other repeating without question word for word what officialdom tells them just as I

have seen great swathes of spews what they have been told to think by the official narrative. Police and public may seem to be in different groups, but their mentality is the same. Most people do whatever they are told in fear almost the entirety of the police do what they are told for the same reason. Ultimately it's the tiny inner core of the global Cult that's telling both what to do. So Derbyshire police were 'horrified'. Oh, really? Why did they think those kids were playing football? It was to relieve the psychological consequences of lockdown and being denied human contact with their friends and interaction, touch and discourse vital to human psychological health. Being denied this month aŕer month has dismantled the psyche of many children and young people as depression and suicide have exploded. Were Derbyshire police horrified by that? Are you kidding? Reframed people don't have those mental and emotional processes that can see how the impact on the psychological health of youngsters is far more dangerous than any 'virus' even if you take the mendacious official figures to be true. The reframed are told (programmed) how to act and so they do. The Derbyshire Chief Constable in the first period of lockdown when the black dye and drones nonsense was going on was Peter Goodman. He was the man who severed the connection between his force and the Derbyshire Constabulary Male Voice Choir when he decided that it was not inclusive enough to allow women to join. The fact it was a male voice choir making a particular sound produced by male voices seemed to elude a guy who terrifyingly ran policing in Derbyshire. He retired weeks aŕer his force was condemned as disgraceful by former Supreme Court Justice Jonathan Sumption for their behaviour over extreme lockdown impositions. Goodman was replaced by his deputy Rachel Swann who was in charge when her officers were 'horrified'. The police statement over the boys commiŕing the hanging-offence of playing football included the line about the youngsters being 'irresponsible in the times we are all living through' missing the point that the real relevance of the 'times we are all living through' is the imposition of fascism enforced by psychopaths and reframed minds of police officers playing such a vital part in establishing the fascist tyranny that their own children and grandchildren will have to live in their entire lives. As a definition of insanity that is hard to

beat although it might be run close by imposing masks on people that can have a serious effect on their health while wearing a face nappy all day themselves. Once again public and police do it for the same reason – the authorities tell them to and who are they to have the self-respect to say no? Wokers in uniform How reframed do you have to be to arrest a six-year-old and take him to court for picking a flower while waiting for a bus? Brain dead police and officialdom did just that in North Carolina where criminal proceedings happen regularly for children under nine. A journey Julie Boyer gave the six-year-old crayons and a colouring book during the ‘flower’ hearing while the ‘adults’ decided his fate. County Chief District Court Judge Jay Corpening asked: ‘Should a child that believes in Santa Claus, the Easter Bunny and the tooth fairy be making life-altering decisions?’ Well, of course not, but common sense has no meaning when you have a common purpose and a reframed mind. Treating children in this way, and police operating in American schools, is all part of the psychological preparation for children to accept a police state as normal all their adult lives. The same goes for all the cameras and biometric tracking technology in schools. Police training is focused on reframing them as snowflake Wokers and this is happening in the military. Pentagon top brass said that ‘training sessions on extremism’ were needed for troops who asked why they were so focused on the Capitol Building riot when Black Lives Matter riots were ignored. What’s the difference between them some apparently and rightly asked. Actually, there is a difference. Five people died in the Capitol riot, only one through violence, and that was a police officer shooting an unarmed protestor. BLM riots killed at least 25 people and cost billions. Asking the question prompted the psychopaths and reframed minds that run the Pentagon to say that more ‘education’ (programming) was needed. Troop training is all based on psychological programming to make them fodder for the Cult – ‘Military men are just dumb, stupid animals to be used as pawns in foreign policy’ as Cult-to-his-DNA former Secretary of State Henry Kissinger famously said. Governments see the police in similar terms and it’s time for those among them who can see this to defend the people and stop being enforcers of the Cult agenda upon the people. The US military, like the country itself, is being

targeted for destruction through a long list of Woke impositions. Cult-owned gaga 'President' Biden signed an executive order when he took office to allow taxpayer money to pay for transgender surgery for active military personnel and veterans. Are you a man soldier? No, I'm a LGBTQIA+ with a hint of Skoliosexual and Spectrasexual. Oh, good man. Bad choice of words you bigot. The Pentagon announced in March, 2021, the appointment of the first 'diversity and inclusion officer' for US Special Forces. Richard Torres-Estrada arrived with the publication of a 'D&I Strategic Plan which will guide the enterprise-wide effort to institutionalize and sustain D&I'. If you think a Special Forces 'Strategic Plan' should have something to do with defending America you haven't been paying attention. Defending Woke is now the military's new role. Torres-Estrada has posted images comparing Donald Trump with Adolf Hitler and we can expect no bias from him as a representative of the supposedly non-political Pentagon. Cable news host Tucker Carlson said: 'The Pentagon is now the Yale faculty lounge but with cruise missiles.' Meanwhile Secretary of Defense Lloyd Austin, a board member of weapons-maker Raytheon with stock and compensation interests in October, 2020, worth \$1.4 million, said he was purging the military of the 'enemy within' – anyone who isn't Woke and supports Donald Trump. Austin refers to his targets as 'racist extremists' while in true Woke fashion being himself a racist extremist. Pentagon documents pledge to 'eradicate, eliminate and conquer all forms of racism, sexism and homophobia'. The definitions of these are decided by 'diversity and inclusion committees' peopled by those who see racism, sexism and homophobia in every situation and opinion. Woke (the Cult) is dismantling the US military and purging testosterone as China expands its military and gives its troops 'masculinity training'. How do we think that is going to end when this is all Cult coordinated? The US military, like the British military, is controlled by Woke and spineless top brass who just go along with it out of personal career interests. 'Woke' means fast asleep Mind control and perception manipulation techniques used on individuals to create group-think have been unleashed on the global population in general. As a result many have no capacity to see the obvious fascist agenda being installed all around them or what 'Covid' is really all about. Their brains are firewalled like a computer

system not to process certain concepts, thoughts and realisations that are bad for the Cult. The young are most targeted as the adults they will be when the whole fascist global state is planned to be fully implemented. They need to be prepared for total compliance to eliminate all pushback from entire generations. The Cult has been pouring billions into taking complete control of 'education' from schools to universities via its operatives and corporations and not least Bill Gates as always. The plan has been to transform 'education' institutions into programming centres for the mentality of 'Woke'. James McConnell, professor of psychology at the University of Michigan, wrote in Psychology Today in 1970: The day has come when we can combine sensory deprivation with drugs, hypnosis, and astute manipulation of reward and punishment, to gain almost absolute control over an individual's behaviour. It should then be possible to achieve a very rapid and highly effective type of brainwashing that would allow us to make dramatic changes in a person's behaviour and personality ... We should reshape society so that we all would be trained from birth to want to do what society wants us to do. We have the techniques to do it... no-one owns his own personality you acquired, and there's no reason to believe you should have the right to refuse to acquire a new personality if your old one is anti-social. This was the potential for mass brainwashing in 1970 and the mentality there displayed captures the arrogant psychopathy that drives it forward. I emphasise that not all young people have succumbed to Woke programming and those that haven't are incredibly impressive people given that today's young are the most perceptually-targeted generations in history with all the technology now involved. Vast swathes of the young generations, however, have fallen into the spell – and that's what it is – of Woke. The Woke mentality and perceptual program is founded on inversion and you will appreciate later why that is so significant. Everything with Woke is inverted and the opposite of what it is claimed to be. Woke was a term used in African-American culture from the 1900s and referred to an awareness of social and racial justice. This is not the meaning of the modern version or 'New Woke' as I call it in The Answer. Oh, no, Woke today means something very different no m<sup>â</sup>jer how much Wokers may seek to hide that and insist Old Woke and New Woke are the same. See if you find any

'awareness of social justice' here in the modern variety: Woke demands 'inclusivity' while excluding anyone with a different opinion and calls for mass censorship to silence other Woke claims to stand against oppression when imposing oppression is the foundation of all that it does. It is the driver of political correctness which is nothing more than a Cult invention to manipulate the population to silence itself. Woke believes itself to be 'liberal' while pursuing a global society that can only be described as fascist (see 'anti-fascist' fascist Woke calls for 'social justice' while spreading injustice wherever it goes against the common 'enemy' which can be easily identified as a differing view. Woke is supposed to be a metaphor for 'awake' when it is solid- gold asleep and deep in a Cult-induced coma that meets the criteria for 'off with the fairies'. I state these points as obvious facts if people only care to look. I don't do this with a sense of condemnation. We need to appreciate that the onslaught of perceptual programming on the young has been incessant and merciless. I can understand why so many have been reframed, or, given their youth, framed from the start to see the world as the Cult demands. The Cult has had access to their minds day after day in its 'education' system for their entire formative years. Perception is formed from information received and the Cult-created system is a life-long download of information delivered to elicit a particular perception, thus behaviour. The more this has expanded into still new extremes in recent decades and ever- increasing censorship has deleted other opinions and information why wouldn't that lead to a perceptual reframing on a mass scale? I have described already cradle-to-grave programming and in more recent times the targeting of young minds from birth to adulthood has entered the stratosphere. This has taken the form of skewing what is 'taught' to fit the Cult agenda and the omnipresent techniques of group-think to isolate non-believers and pressure them into line. There has always been a tendency to follow the herd, but we really are in a new world now in relation to that. We have parents who can see the 'Covid' hoax told by their children not to stop them wearing masks at school, being 'Covid' tested or having the 'vaccine' in fear of the peer-pressure consequences of being different. What is 'peer-pressure' if not pressure to conform to group-think? Renegade Minds never

group-think and always retain a set of perceptions that are unique to them. Group-think is always underpinned by consequences for not group-thinking. Abuse now aimed at those refusing DNA-manipulating 'Covid vaccines' are a potent example of this. The biggest pressure to conform comes from the very group which is itself being manipulated. 'I am programmed to be part of a hive mind and so you must be.' Woke control structures in 'education' now apply to every mainstream organisation. Those at the top of the 'education' hierarchy (the Cult) decide the policy. This is imposed on governments through the Cult network; governments impose it on schools, colleges and universities; their leadership impose the policy on teachers and academics and they impose it on children and students. At any level where there is resistance, perhaps from a teacher or university lecturer, they are targeted by the authorities and often fired. Students themselves regularly demand the dismissal of academics (increasingly few) at odds with the narrative that the students have been programmed to believe in. It is quite a thought that students who are being targeted by the Cult become so consumed by programmed group-think that they launch protests and demand the removal of those who are trying to push back against those targeting the students. Such is the scale of perceptual inversion. We see this with 'Covid' programming as the Cult imposes the rules via psycho-psychologists and governments on shops, transport companies and businesses which impose them on their staff who impose them on their customers who pressure Pushbackers to conform to the will of the Cult which is in the process of destroying them and their families. Scan all aspects of society and you will see the same sequence every time. Fact free Woke and hijacking the 'left' There is no more potent example of this than 'Woke', a mentality only made possible by the deletion of factual evidence by an 'education' system seeking to produce an ever more uniform society. Why would you bother with facts when you don't know any? Deletion of credible history both in volume and type is highly relevant. Orwell said: 'Who controls the past controls the future: who controls the present controls the past.' They who control the perception of the past control the perception of the future and they who control the present control the perception of the past through the writing



and deleting of history. Why would you oppose the imposition of Marxism in the name of Wokeism when you don't know that Marxism cost at least 100 million lives in the 20th century alone? Watch videos and read reports in which Woker generations are asked basic historical questions – it's mind-blowing. A survey of 2,000 people found that six percent of millennials (born approximately early 1980s to early 2000s) believed the Second World War (1939-1945) broke out with the assassination of President Kennedy (in 1963) and one in ten thought Margaret Thatcher was British Prime Minister at the time. She was in office between 1979 and 1990. We are in a post-fact society. Provable facts are no defence against the fascism of political correctness or Silicon Valley censorship. Facts don't matter anymore as we have witnessed with the 'Covid' hoax. Sacrificing uniqueness to the Woke group-think religion is all you are required to do and that means thinking for yourself is the biggest Woke no, no. All religions are an expression of group-think and censorship and Woke is just another religion with an orthodoxy defended by group-think and censorship. Burned at the stake becomes burned on Twitter which leads back eventually to burned at the stake as Woke humanity regresses to ages past. The biggest Woke inversion of all is its creators and funders. I grew up in a traditional left of centre political household on a council estate in Leicester in the 1950s and 60s – you know, the left that challenged the power of wealth-hoarding elites and threats to freedom of speech and opinion. In those days students went on marches defending freedom of speech while today's Wokers march for its deletion. What on earth could have happened? Those very elites (collectively the Cult) that we opposed in my youth and early life have funded into existence the antithesis of that former left and hijacked the 'brand' while inverting everything it ever stood for. We have a mentality that calls itself 'liberal' and 'progressive' while acting like fascists. Cult billionaires and their corporations have funded themselves into control of 'education' to ensure that Woke programming is unceasing throughout the formative years of children and young people and that non-Wokers are isolated (that word again) whether they be students, teachers or college professors. The Cult has funded into existence the now colossal global network of Woke organisations that have

spawned and promoted all the 'causes' on the Cult wish-list for global transformation and turned Wokers into demanders of them. Does anyone really think it's a coincidence that the Cult agenda for humanity is a carbon (sorry) copy of the societal transformations desired by Woke?? These are only some of them: Political correctness: The means by which the Cult deletes all public debates that it knows it cannot win if we had the free-flow of information and evidence. Human-caused 'climate change': The means by which the Cult seeks to transform society into a globally-controlled dictatorship imposing its will over the fine detail of everyone's lives 'to save the planet' which doesn't actually need saving. Transgender obsession: Preparing collective perception to accept the 'new human' which would not have genders because it would be created technologically and not through procreation. I'll have much more on this in Human 2.0. Race obsession: The means by which the Cult seeks to divide and rule the population by triggering racial division through the perception that society is more racist than ever when the opposite is the case. Is it perfect in that regard? No. But to compare today with the racism of apartheid and segregation brought to an end by the civil rights movement in the 1960s is to insult the memory of that movement and inspirations like Martin Luther King. Why is the 'anti-racism' industry (which it is) so dominated by privileged white White supremacy: This is a label used by privileged white people to demonise poor and deprived white people pushing back on tyranny to marginalise and destroy them. White people are being especially targeted as the dominant race by number within Western society which the Cult seeks to transform in its image. If you want to change a society you must weaken and undermine its biggest group and once you have done that by using the other groups you next turn on them to do the same ... 'Then they came for the Jews and I was not a Jew so I did nothing.' Mass migration: The mass movement of people from the Middle East, Africa and Asia into Europe, from the south into the United States and from Asia into Australia are another way the Cult seeks to dilute the racial, cultural and political influence of white people on Western society. White people ask why their governments appear to be working against them while being politically and culturally biased towards incoming cultures. Well,

here's your answer. In the same way sexually 'straight' people, men and women, ask why the authorities are biased against them in favour of other sexualities. The answer is the same – that's the way the Cult wants it to be for very. These are all central parts of the Cult agenda and central parts of the Woke agenda and Woke was created and continues to be funded to an immense degree by Cult billionaires and corporations. If anyone begins to say 'coincidence' the syllables should stick in their throat. Billionaire 'social justice warriors' Joe Biden is a 100 percent-owned asset of the Cult and the Wokers' man in the White House whenever he can remember his name and for however long he lasts with his rapidly diminishing cognitive function. Even walking up the steps of an aircraft without falling on his arse would appear to be a challenge. He's not an empty-shell puppet or anything. From the minute Biden took office (or the Cult did) he began his executive orders promoting the Woke wish-list. You will see the Woke agenda imposed ever more severely because it's really the Cult agenda. Woke organisations and activist networks spawned by the Cult are funded to the extreme so long as they promote what the Cult wants to happen. Woke is funded to promote 'social justice' by billionaires who become billionaires by destroying social justice. The social justice mantra is only a cover for dismantling social justice and funded by billionaires that couldn't give a damn about social justice. Everything makes sense when you see that. One of Woke's premier funders is Cult billionaire financier George Soros who said: 'I am basically there to make money, I cannot and do not look at the social consequences of what I do.' This is the same Soros who has given more than \$32 billion to his Open Society Foundations global Woke network and funded Black Lives Matter, mass immigration into Europe and the United States, transgender activism, climate change activism, political correctness and groups targeting 'white supremacy' in the form of privileged white thugs that dominate Antifa. What a scam it all is and when you are dealing with the unquestioning fact-free zone of Woke scamming them is child's play. All you need to pull it off in all these organisations are a few in-the-know agents of the Cult and an army of naïve, reframed, uninformed, narcissistic, know-nothings convinced of their own self-righteousness, self-purity and virtue. Soros and fellow billionaires

and billionaire corporations have poured hundreds of millions into Black Lives Matter and connected groups and promoted them to a global audience. None of this is motivated by caring about black people. These are the billionaires that have controlled and exploited a system that leaves millions of black people in abject poverty and deprivation which they do absolutely nothing to address. The same Cult networks funding BLM were behind the slave trade! Black Lives Matter hijacked a phrase that few would challenge and they have turned this laudable concept into a political weapon to divide society. You know that BLM is a fraud when it claims that All Lives Matter, the most inclusive statement of all, is 'racist'. BLM and its Cult masters don't want to end racism. To them it's a means to an end to control all of humanity never mind the colour, creed, culture or background. What has destroying the nuclear family got to do with ending racism? Nothing – but that is one of the goals of BLM and also happens to be a goal of the Cult as I have been exposing in my books for decades. Stealing children from loving parents and giving schools ever more power to override parents is part of that same agenda. BLM is a Marxist organisation and why would that not be the case when the Cult created Marxism and BLM? Patrisse Cullors, a BLM co-founder, said in a 2015 video that she and her fellow organisers, including co-founder Alicia Garza, are 'trained Marxists'. The lady known after marriage as Patrisse Khan-Cullors bought a \$1.4 million home in 2021 in one of the whitest areas of California with a black population of just 1.6 per cent and has so far bought four high-end homes for a total of \$3.2 million. How very Marxist. There must be a bit of spare in the BLM coffers, however, when Cult corporations and billionaires have handed over the best part of \$100 million. Many black people can see that Black Lives Matter is not working for them, but against them, and this is still more confirmation. Black journalist Jason Whitlock, who had his account suspended by Twitter for simply linking to the story about the 'Marxists' home buying spree, said that BLM leaders are 'making millions of dollars off the backs of these dead black men who they wouldn't spit on if they were on fire and alive'. Black Lies Matter Cult assets and agencies came together to promote BLM in the wake of the death of career criminal George Floyd who had been jailed a number of times including for forcing

his way into the home of a black woman with others in a raid in which a gun was pointed at her stomach. Floyd was filmed being held in a Minneapolis street in 2020 with the knee of a police officer on his neck and he subsequently died. It was an appalling thing for the officer to do, but the same technique has been used by police on peaceful protestors of lockdown without any outcry from the Woke brigade. As unquestioning supporters of the Cult agenda Wokers have supported lockdown and all the 'Covid' claptrap while aĵacking anyone standing up to the tyranny imposed in its name. Court documents would later include details of an autopsy on Floyd by County Medical Examiner Dr Andrew Baker who concluded that Floyd had taken a fatal level of the drug fentanyl. None of this maĵered to fact-free, question-free, Woke. Floyd's death was followed by worldwide protests against police brutality amid calls to defund the police. Throwing babies out with the bathwater is a Woke speciality. In the wake of the murder of British woman Sarah Everard a Green Party member of the House of Lords, Baroness Jones of Moulsecoomb (Nincompoopia would have been beĵer), called for a 6pm curfew for all men. This would be in breach of the Geneva Conventions on war crimes which ban collective punishment, but that would never have crossed the black and white Woke mind of Baroness Nincompoopia who would have been far too convinced of her own self-righteousness to compute such details. Many American cities did defund the police in the face of Floyd riots and aĜer \$15 million was deleted from the police budget in Washington DC under useless Woke mayor Muriel Bowser car- jacking alone rose by 300 percent and within six months the US capital recorded its highest murder rate in 15 years. The same happened in Chicago and other cities in line with the Cult/Soros plan to bring fear to streets and neighbourhoods by reducing the police, releasing violent criminals and not prosecuting crime. This is the mob-rule agenda that I have warned in the books was coming for so long. Shootings in the area of Minneapolis where Floyd was arrested increased by 2,500 percent compared with the year before. Defunding the police over George Floyd has led to a big increase in dead people with many of them black. Police protection for politicians making these decisions stayed the same or increased as you would expect from professional

hypocrites. The Cult doesn't actually want to abolish the police. It wants to abolish local control over the police and hand it to federal government as the psychopaths advance the Hunger Games Society. Many George Floyd protests turned into violent riots with black stores and businesses destroyed by fire and looting across America fuelled by Black Lives Matter. Woke doesn't do irony. If you want civil rights you must loot the liquor store and the supermarket and make off with a smart TV. It's the only way. It's not a race war – it's a class war Black people are patronised by privileged blacks and whites alike and told they are victims of white supremacy. I find it extraordinary to watch privileged blacks supporting the very system and bloodline networks behind the slave trade and parroting the same Cult-serving manipulative crap of their privileged white, often billionaire, associates. It is indeed not a race war but a class war and colour is just a diversion. Black Senator Cory Booker and black Congresswoman Maxine Waters, more residents of Nincompoopia, personify this. Once you tell people they are victims of someone else you devalue both their own responsibility for their plight and the power they have to impact on their reality and experience. Instead we have: 'You are only in your situation because of whiteness – turn on them and everything will change.' It won't change. Nothing changes in our lives unless we change it. Crucial to that is never seeing yourself as a victim and always as the creator of your reality. Life is a simple sequence of choice and consequence. Make different choices and you create different consequences. You have to make those choices – not Black Lives Matter, the Woke Mafia and anyone else that seeks to dictate your life. Who are they these Wokers, an emotional and psychological road traffic accident, to tell you what to do? Personal empowerment is the last thing the Cult and its Black Lives Matter want black people or anyone else to have. They claim to be defending the underdog while creating and perpetuating the underdog. The Cult's worst nightmare is human unity and if they are going to keep blacks, whites and every other race under economic servitude and control then the focus must be diverted from what they have in common to what they can be manipulated to believe divides them. Blacks have to be told that their poverty and plight is the fault of the white bloke living on the street in the same poverty and

with the same plight they are experiencing. The difference is that your plight black people is due to him, a white supremacist with 'white privilege' living on the street. Don't unite as one human family against your mutual oppressors and suppressors – fight the oppressor with the white face who is as financially deprived as you are. The Cult knows that as its 'Covid' agenda moves into still new levels of extremism people are going to respond and it has been spreading the seeds of disunity everywhere to stop a united response to the evil that targets all of us. Racist attacks on 'whiteness' are getting ever more outrageous and especially through the American Democratic Party which has an appalling history for anti-black racism. Barack Obama, Joe Biden, Hillary Clinton and Nancy Pelosi all eulogised about Senator Robert Byrd at his funeral in 2010 after a nearly 60-year career in Congress. Byrd was a brutal Ku Klux Klan racist and a violent abuser of Cathy O'Brien in MKUltra. He said he would never fight in the military 'with a negro by my side' and 'rather I should die a thousand times, and see Old Glory trampled in the dirt never to rise again, than to see this beloved land of ours become degraded by race mongrels, a throwback to the blackest specimen from the wilds'. Biden called Byrd a 'very close friend and mentor'. These 'Woke' hypocrites are not anti-racist they are anti-poor and anti-people not of their perceived class. Here is an illustration of the scale of anti-white racism to which we have now descended. Seriously Woke and moronic New York Times contributor Damon Young described whiteness as a 'virus' that 'like other viruses will not die until there are no bodies left for it to infect'. He went on: '... the only way to stop it is to locate it, isolate it, extract it, and kill it.' Young can say that as a black man with no consequences when a white man saying the same in reverse would be facing a jail sentence. That's racism. We had super-Woke numbskull senators Tammy Duckworth and Mazie Hirono saying they would object to future Biden Cabinet appointments if he did not nominate more Asian Americans and Pacific Islanders. Never mind the ability of the candidate what do they look like? Duckworth said: 'I will vote for racial minorities and I will vote for LGBTQ, but anyone else I'm not voting for.' Appointing people on the grounds of race is illegal, but that was not a problem for this ludicrous pair. They were on-message and that's a free pass in any situation.

Critical race racism White children are told at school they are intrinsically racist as they are taught the divisive 'critical race theory'. This claims that the law and legal institutions are inherently racist and that race is a socially constructed concept used by white people to further their economic and political interests at the expense of people of colour. White is a 'virus' as we've seen. Racial inequality results from 'social, economic, and legal differences that white people create between races to maintain white interests which leads to poverty and criminality in minority communities'. I must tell that to the white guy sleeping on the street. The principal of East Side Community School in New York sent white parents a manifesto that called on them to become 'white traitors' and advocate for full 'white abolition'. These people are teaching your kids when they urgently need a psychiatrist. The 'school' included a chart with 'eight white identities' that ranged from 'white supremacist' to 'white abolition' and defined the behaviour white people must follow to end 'the regime of whiteness'. Woke blacks and their privileged white associates are acting exactly like the slave owners of old and Ku Klux Klan racists like Robert Byrd. They are too full of their own self- purity to see that, but it's true. Racism is not a body type; it's a state of mind that can manifest through any colour, creed or culture. Another racial fraud is 'equity'. Not equality of treatment and opportunity – equity. It's a term spun as equality when it means something very different. Equality in its true sense is a raising up while 'equity' is a race to the bottom. Everyone in the same level of poverty is 'equity'. Keep everyone down – that's equity. The Cult doesn't want anyone in the human family to be empowered and BLM leaders, like all these 'anti-racist' organisations, continue their privileged, pampered existence by perpetuating the perception of gathering racism. When is the last time you heard an 'anti-racist' or 'anti-Semitism' organisation say that acts of racism and discrimination have fallen? It's not in the interests of their fund- raising and power to influence and the same goes for the professional soccer anti-racism operation, Kick It Out. Two things confirmed that the Black Lives Matter riots in the summer of 2020 were Cult creations. One was that while anti-lockdown protests were condemned in this same period for 'transmitting 'Covid' the authorities supported mass gatherings of Black Lives Matter supporters.



I even saw self-deluding people claiming to be doctors say the two types of protest were not the same. No – the non-existent ‘Covid’ was in favour of lockdowns and attacked those that protested against them while ‘Covid’ supported Black Lives Matter and kept well away from its protests. The whole thing was a joke and as lockdown protestors were arrested, often brutally, by reframed Face-Nappies we had the grotesque sight of police officers taking the knee to Black Lives Matter, a Cult-funded Marxist organisation that supports violent riots and wants to destroy the nuclear family and white people. He’s not white? Shucks! Woke obsession with race was on display again when ten people were shot dead in Boulder, Colorado, in March, 2021. Cult-owned Woke TV channels like CNN said the shooter appeared to be a white man and Wokers were on Twitter condemning ‘violent white men’ with the usual mantras. Then the shooter’s name was released as Ahmad Al Aliwi Alissa, an anti-Trump Arab-American, and the sigh of disappointment could be heard five miles away. Never mind that ten people were dead and what that meant for their families. Race baiting was all that mattered to these sick Cult-serving people like Barack Obama who exploited the deaths to further divide America on racial grounds which is his job for the Cult. This is the man that ‘racist’ white Americans made the first black president of the United States and then gave him a second term. Not-very-bright Obama has become filthy rich on the back of that and today appears to have a big influence on the Biden administration. Even so he’s still a downtrodden black man and a victim of white supremacy. This disingenuous fraud reveals the contempt he has for black people when he puts on a Deep South Alabama accent whenever he talks to them, no, at them. Another BLM red flag was how the now fully-Woke (fully-Cult) and fully-virtue-signalled professional soccer authorities had their teams taking the knee before every match in support of Marxist Black Lives Matter. Soccer authorities and clubs displayed ‘Black Lives Matter’ on the players’ shirts and flashed the name on electronic billboards around the pitch. Any fans that condemned what is a Freemasonic taking-the-knee ritual were widely condemned as you would expect from the Woke virtue-signallers of professional sport and the now fully-Woke media. We have reverse racism in which you are banned from criticising any race or culture

except for white people for whom anything goes – say what you like, no problem. What has this got to do with racial harmony and equality? We've had black supremacists from Black Lives Matter telling white people to fall to their knees in the street and apologise for their white supremacy. Black supremacists acting like white supremacist slave owners of the past couldn't breach their self-obsessed, race-obsessed sense of self-purity. Joe Biden appointed a race-obsessed black supremacist Kristen Clarke to head the Justice Department Civil Rights Division. Clarke claimed that blacks are endowed with 'greater mental, physical and spiritual abilities' than whites. If anyone reversed that statement they would be vilified. Clarke is on-message so no problem. She's never seen a black-white situation in which the black figure is anything but a virtuous victim and she heads the Civil Rights Division which should treat everyone the same or it isn't civil rights. Another perception of the Renegade Mind: If something or someone is part of the Cult agenda they will be supported by Woke governments and media no matter what. If they're not, they will be condemned and censored. It really is that simple and so racist Clarke prospers despite (make that because of) The end of culture Biden's administration is full of such racial, cultural and economic bias as the Cult requires the human family to be divided into warring factions. We are now seeing racially-segregated graduations and everything, but everything, is defined through the lens of perceived 'racism. We have 'racist' mathematics, 'racist' food and even 'racist' plants. World famous Kew Gardens in London said it was changing labels on plants and flowers to tell its pre-'Covid' more than two million visitors a year how racist they are. Kew director Richard Deverell said this was part of an effort to 'move quickly to decolonise collections' after they were approached by one Ajay Chhabra 'an actor with an insight into how sugar cane was linked to slavery'. They are plants you idiots. 'Decolonisation' in the Woke manual really means colonisation of society with its mentality and by extension colonisation by the Cult. We are witnessing a new Chinese-style 'Cultural Revolution' so essential to the success of all Marxist takeovers. Our cultural past and traditions have to be swept away to allow a new culture to be built-back-better. Woke targeting of long-standing Western cultural pillars including historical

monuments and cancelling of historical figures is what happened in the Mao revolution in China which 'purged remnants of capitalist and traditional elements from Chinese society' and installed Maoism as the dominant ideology'. For China see the Western world today and for 'dominant ideology' see Woke. Beïer still see Marxism or Maoism. The 'Covid' hoax has specifically sought to destroy the arts and all elements of Western culture from people meeting in a pub or restaurant to closing theatres, music venues, sports stadiums, places of worship and even banning singing. Destruction of Western society is also why criticism of any religion is banned except for Christianity which again is the dominant religion as white is the numerically- dominant race. Christianity may be fading rapidly, but its history and traditions are weaved through the fabric of Western society. Delete the pillars and other structures will follow until the whole thing collapses. I am not a Christian defending that religion when I say that. I have no religion. It's just a fact. To this end Christianity has itself been turned Woke to usher its own downfall and its ranks are awash with 'change agents' – knowing and unknowing – at every level including Pope Francis (definitely knowing) and the clueless Archbishop of Canterbury Justin Welby (possibly not, but who can be sure?). Woke seeks to coordinate aïacks on Western culture, traditions, and ways of life through 'intersectionality' defined as 'the complex, cumulative way in which the effects of multiple forms of discrimination (such as racism, sexism, and classism) combine, overlap, or intersect especially in the experiences of marginalised individuals or groups'. Wade through the Orwellian Woke-speak and this means coordinating disparate groups in a common cause to overthrow freedom and liberal values. The entire structure of public institutions has been infested with Woke – government at all levels, political parties, police, military, schools, universities, advertising, media and trade unions. This abomination has been achieved through the Cult web by appointing Wokers to positions of power and baïering non-Wokers into line through intimidation, isolation and threats to their job. Many have been fired in the wake of the empathy-deleted, vicious hostility of 'social justice' Wokers and the desire of gutless, spineless employers to virtue-signal their Wokeness. Corporations are filled with Wokers today, most notably those in Silicon Valley.

Ironically at the top they are not Woke at all. They are only exploiting the mentality their Cult masters have created and funded to censor and enslave while the Wokers cheer them on until it's their turn. Thus the Woke 'liberal leĜ' is an inversion of the traditional liberal leĜ. Campaigning for justice on the grounds of power and wealth distribution has been replaced by campaigning for identity politics. The genuine traditional leĜ would never have taken money from today's billionaire abusers of fairness and justice and nor would the billionaires have wanted to fund that genuine leĜ. It would not have been in their interests to do so. The division of opinion in those days was between the haves and have nots. This all changed with Cult manipulated and funded identity politics. The division of opinion today is between Wokers and non-Wokers and not income brackets. Cult corporations and their billionaires may have taken wealth disparity to cataclysmic levels of injustice, but as long as they speak the language of Woke, hand out the dosh to the Woke network and censor the enemy they are 'one of us'. Billionaires who don't give a damn about injustice are laughing at them till their bellies hurt. Wokers are not even close to self-aware enough to see that. The transformed 'leĜ' dynamic means that Wokers who drone on about 'social justice' are funded by billionaires that have destroyed social justice the world over. It's why they are billionaires. The climate con Nothing encapsulates what I have said more comprehensively than the hoax of human-caused global warming. I have detailed in my books over the years how Cult operatives and organisations were the pump-primers from the start of the climate con. A purpose-built vehicle for this is the Club of Rome established by the Cult in 1968 with the Rockefellers and Rothschilds centrally involved all along. Their gofer frontman Maurice Strong, a Canadian oil millionaire, hosted the Earth Summit in Rio de Janeiro, Brazil, in 1992 where the global 'green movement' really expanded in earnest under the guiding hand of the Cult. The Earth Summit established Agenda 21 through the Cult-created-and-owned United Nations to use the illusion of human-caused climate change to justify the transformation of global society to save the world from climate disaster. It is a No-Problem-Reaction-Solution sold through governments, media, schools and universities as whole generations have been terrified into believing that the world

was going to end in their lifetimes unless what old people had inflicted upon them was stopped by a complete restructuring of how everything is done. Chill, kids, it's all a hoax. Such restructuring is precisely what the Cult agenda demands (purely by coincidence of course). Today this has been given the codename of the Great Reset which is only an updated term for Agenda 21 and its associated Agenda 2030. The laîcher, too, is administered through the UN and was voted into being by the General Assembly in 2015. Both 21 and 2030 seek centralised control of all resources and food right down to the raindrops falling on your own land. These are some of the demands of Agenda 21 established in 1992. See if you recognise this society emerging today: End national sovereignty State planning and management of all land resources, ecosystems, deserts, forests, mountains, oceans and fresh water; agriculture; rural development; biotechnology; and ensuring 'equity' The state to 'define the role' of business and financial resources Abolition of private property 'Restructuring' the family unit (see BLM) Children raised by the state People told what their job will be Major restrictions on movement Creation of 'human settlement zones' Mass resettlement as people are forced to vacate land where they Dumbing down education Mass global depopulation in pursuit of all the above The United Nations was created as a Trojan horse for world government. With the climate con of critical importance to promoting that outcome you would expect the UN to be involved. Oh, it's involved all right. The UN is promoting Agenda 21 and Agenda 2030 justified by 'climate change' while also driving the climate hoax through its Intergovernmental Panel on Climate Change (IPCC), one of the world's most corrupt organisations. The IPCC has been lying ferociously and constantly since the day it opened its doors with the global media hanging unquestioningly on its every mendacious word. The Green movement is entirely Woke and has long lost its original environmental focus since it was co-opted by the Cult. An obsession with 'global warming' has deleted its values and scrambled its head. I experienced a small example of what I mean on a beautiful country walk that I have enjoyed several times a week for many years. The path merged into the fields and forests and you felt at one with the natural world. Then a 'Green' organisation, the Hampshire and Isle of Wight Wildlife Trust, took over part of

the land and proceeded to cut down a large number of trees, including mature ones, to install a horrible big, bright steel 'this-is-ours-stay-out' fence that destroyed the whole atmosphere of this beautiful place. No one with a feel for nature would do that. Day after day I walked to the sound of chainsaws and a magnificent mature weeping willow tree that I so admired was cut down at the base of the trunk. When I challenged a Woke young girl in a green shirt (of course) about this vandalism she replied: 'It's a weeping willow – it will grow back.' This is what people are paying for when they donate to the Hampshire and Isle of Wight Wildlife Trust and many other 'green' organisations today. It is not the environmental movement that I knew and instead has become a support-system – as with Extinction Rebellion – for a very dark agenda.

Private jets for climate justice The Cult-owned, Gates-funded, World Economic Forum and its founder Klaus Schwab were behind the emergence of Greta Thunberg to harness the young behind the climate agenda and she was invited to speak to the world at ... the UN. Schwab published a book, Covid-19: The Great Reset in 2020 in which he used the 'Covid' hoax and the climate hoax to lay out a new society straight out of Agenda 21 and Agenda 2030. Bill Gates followed in early 2021 when he took time out from destroying the world to produce a book in his name about the way to save it. Gates flies across the world in private jets and admitted that 'I probably have one of the highest greenhouse gas footprints of anyone on the planet ... my personal flying alone is gigantic.' He has also bid for the planet's biggest private jet operator. Other climate change saviours who fly in private jets include John Kerry, the US Special Presidential Envoy for Climate, and actor Leonardo DiCaprio, a 'UN Messenger of Peace with special focus on climate change'. These people are so full of bullshit they could corner the market in manure. We mustn't be sceptical, though, because the Gates book, How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need, is a genuine attempt to protect the world and not an obvious pile of excrement attributed to a mega-psychopath aimed at selling his masters' plans for humanity. The Gates book and the other shite-pile by Klaus Schwab could have been written by the same person and may well have been. Both use 'climate change' and 'Covid' as the excuses for their new society and by coincidence the Cult's

World Economic Forum and Bill and Melinda Gates Foundation promote the climate hoax and hosted Event 201 which pre-empted with a 'simulation' the very 'coronavirus' hoax that would be simulated for real on humanity within weeks. The British 'royal' family is promoting the 'Reset' as you would expect through Prince 'climate change caused the war in Syria' Charles and his hapless son Prince William who said that we must 'reset our relationship with nature and our trajectory as a species' to avoid a climate disaster. Amazing how many promoters of the 'Covid' and 'climate change' control systems are connected to Gates and the World Economic Forum. A 'study' in early 2021 claimed that carbon dioxide emissions must fall by the equivalent of a global lockdown roughly every two years for the next decade to save the planet. The 'study' appeared in the same period that the Schwab mob claimed in a video that lockdowns destroying the lives of billions are good because they make the earth 'quieter' with less 'ambient noise'. They took down the video amid a public backlash for such arrogant, empathy-deleted stupidity. You see, however, where they are going with this. Corinne Le Quéré, a professor at the Tyndall Centre for Climate Change Research, University of East Anglia, was lead author of the climate lockdown study, and she writes for ... the World Economic Forum. Gates calls in 'his' book for changing 'every aspect of the economy' (long-time Cult agenda) and for humans to eat synthetic 'meat' (predicted in my books) while cows and other farm animals are eliminated. Australian TV host and commentator Alan Jones described what carbon emission targets would mean for farm animals in Australia alone if emissions were reduced as demanded by 35 percent by 2030 and zero by 2050: Well, let's take agriculture, the total emissions from agriculture are about 75 million tonnes of carbon dioxide, equivalent. Now reduce that by 35 percent and you have to come down to 50 million tonnes, I've done the maths. So if you take for example 1.5 million cows, you're going to have to reduce the herd by 525,000 [by] 2030, nine years, that's 58,000 cows a year. The beef herd's 30 million, reduce that by 35 percent, that's 10.5 million, which means 1.2 million cattle have to go every year between now and 2030. This is insanity! There are 75 million sheep. Reduce that by 35 percent, that's 26 million sheep, that's almost 3 million a year. So under the Paris

Agreement over 30 million beasts. dairy cows, cattle, pigs and sheep would go. More than 8,000 every minute of every hour for the next decade, do these people know what they're talking about? Clearly they don't at the level of campaigners, politicians and administrators. The Cult does know; that's the outcome it wants. We are faced with not just a war on humanity. Animals and the natural world are being targeted and I have been saying since the 'Covid' hoax began that the plan eventually was to claim that the 'deadly virus' is able to jump from animals, including farm animals and domestic pets, to humans. Just before this book went into production came this story: 'Russia registers world's first Covid-19 vaccine for cats & dogs as makers of Sputnik V warn pets & farm animals could spread virus'. The report said 'top scientists warned that the deadly pathogen could soon begin spreading through homes and farms' and 'the next stage is the infection of farm and domestic animals'. Know the outcome and you'll see the journey. Think what that would mean for animals and keep your eye on a term called zoonosis or zoonotic diseases which transmit between animals and humans. The Cult wants to break the connection between animals and people as it does between people and people. Farm animals fit with the Cult agenda to transform food from natural to synthetic. The gas of life is killing us There can be few greater examples of Cult inversion than the condemnation of carbon dioxide as a dangerous pollutant when it is the gas of life. Without it the natural world would be dead and so we would all be dead. We breathe in oxygen and breathe out carbon dioxide while plants produce oxygen and absorb carbon dioxide. It is a perfect symbiotic relationship that the Cult wants to dismantle for reasons I will come to in the final two chapters. Gates, Schwab, other Cult operatives and mindless repeaters, want the world to be 'carbon neutral' by at least 2050 and the earlier the better. 'Zero carbon' is the cry echoed by lunatics calling for 'Zero Covid' when we already have it. These carbon emission targets will deindustrialise the world in accordance with Cult plans – the post- industrial, post-democratic society – and with so-called renewables like solar and wind not coming even close to meeting human energy needs blackouts and cold are inevitable. Texans got the picture in the winter of 2021 when a snow storm stopped wind turbines and solar panels from



working and the lights went down along with water which relies on electricity for its supply system. Gates wants everything to be powered by electricity to ensure that his masters have the kill switch to stop all human activity, movement, cooking, water and warmth any time they like. The climate lie is so stupendously inverted that it claims we must urgently reduce carbon dioxide when we don't have enough. Co2 in the atmosphere is a little above 400 parts per million when the optimum for plant growth is 2,000 ppm and when it falls anywhere near 150 ppm the natural world starts to die and so do we. It fell to as low as 280 ppm in an 1880 measurement in Hawaii and rose to 413 ppm in 2019 with industrialisation which is why the planet has become greener in the industrial period. How insane then that psychopathic madman Gates is not satisfied only with blocking the rise of Co2. He's funding technology to suck it out of the atmosphere. The reason why will become clear. The industrial era is not destroying the world through Co2 and has instead turned around a potentially disastrous ongoing fall in Co2. Greenpeace co-founder and scientist Patrick Moore walked away from Greenpeace in 1986 and has exposed the green movement for fear-mongering and lies. He said that 500 million years ago there was 17 times more Co2 in the atmosphere than we have today and levels have been falling for hundreds of millions of years. In the last 150 million years Co2 levels in Earth's atmosphere had reduced by 90 percent. Moore said that by the time humanity began to unlock carbon dioxide from fossil fuels we were at '38 seconds to midnight' and in that sense: 'Humans are [the Earth's] salvation.' Moore made the point that only half the Co2 emitted by fossil fuels stays in the atmosphere and we should remember that all pollution pouring from chimneys that we are told is carbon dioxide is in fact nothing of the kind. It's pollution. Carbon dioxide is an invisible gas. William Happer, Professor of Physics at Princeton University and long-time government adviser on climate, has emphasised the Co2 deficiency for maximum growth and food production. Greenhouse growers don't add carbon dioxide for a bit of fun. He said that most of the warming in the last 100 years, after the earth emerged from the super-cold period of the 'Little Ice Age' into a natural warming cycle, was over by 1940. Happer said that a peak year for warming in 1988 can be explained by a 'monster El Nino'

which is a natural and cyclical warming of the Pacific that has nothing to do with 'climate change'. He said the effect of Co2 could be compared to painting a wall with red paint in that once two or three coats have been applied it didn't matter how much more you slapped on because the wall will not get much redder. Almost all the effect of the rise in Co2 has already happened, he said, and the volume in the atmosphere would now have to double to increase temperature by a single degree. Climate hoaxers know this and they have invented the most ridiculously complicated series of 'feedback' loops to try to overcome this rather devastating fact. You hear puppet Greta going on cluelessly about feedback loops and this is why. The Sun affects temperature? No you climate denier Some other nonsense to contemplate: Climate graphs show that rises in temperature do not follow rises in Co2 – it's the other way round with a lag between the two of some 800 years. If we go back 800 years from present time we hit the Medieval Warm Period when temperatures were higher than now without any industrialisation and this was followed by the Little Ice Age when temperatures plummeted. The world was still emerging from these centuries of serious cold when many climate records began which makes the ever-repeated line of the 'hottest year since records began' meaningless when you are not comparing like with like. The coldest period of the Little Ice Age corresponded with the lowest period of sunspot activity when the Sun was at its least active. Proper scientists will not be at all surprised by this when it confirms the obvious fact that earth temperature is affected by the scale of Sun activity and the energetic power that it subsequently emits; but when is the last time you heard a climate hoaxer talking about the Sun as a source of earth temperature?? Everything has to be focussed on Co2 which makes up just 0.117 percent of so-called greenhouse gases and only a fraction of even that is generated by human activity. The rest is natural. More than 90 percent of those greenhouse gases are water vapour and clouds (Fig 9). Ban moisture I say. Have you noticed that the climate hoaxers no longer use the polar bear as their promotion image? That's because far from becoming extinct polar bear communities are stable or thriving. Joe Bastardi, American meteorologist, weather forecaster and outspoken critic of the climate lie, documents in his book The Climate

Chronicles how weather patterns and events claimed to be evidence of climate change have been happening since long before industrialisation: 'What happened before naturally is happening again, as is to be expected given the cyclical nature of the climate due to the design of the planet.' If you read the detailed background to the climate hoax in my other books you will shake your head and wonder how anyone could believe the crap which has spawned a multi-trillion dollar industry based on absolute garbage (see HIV causes AIDs and Sars-Cov-2 causes 'Covid-19'). Climate and 'Covid' have much in common given they have the same source. They both have the contradictory everything factor in which everything is explained by reference to them. It's hot – 'it's climate change'. It's cold – 'it's climate change'. I got a sniffle – 'it's Covid'. I haven't got a sniffle – 'it's Covid'. Not having a sniffle has to be a symptom of 'Covid'. Everything is and not having a sniffle is especially dangerous if you are a slow walker. For sheer audacity I offer you a Cambridge University 'study' that actually linked 'Covid' to 'climate change'. It had to happen eventually. They concluded that climate change played a role in 'Covid-19' spreading from animals to humans because ... wait for it ... I kid you not ... the two groups were forced closer together as populations grow. Er, that's it. The whole foundation on which this depended was that 'Bats are the likely zoonotic origin of SARS-CoV-1 and SARS-CoV-2'. Well, they are not. They are nothing to do with it. Apart from bats not being the origin and therefore 'climate change' effects on bats being irrelevant I am in awe of their academic insight. Where would we be without them? Not where we are that's for sure. Figure 9: The idea that the gas of life is disastrously changing the climate is an insult to brain One other point about the weather is that climate modification is now well advanced and not every major weather event is natural – or earthquake come to that. I cover this subject at some length in other books. China is openly planning a rapid expansion of its weather modification programme which includes changing the climate in an area more than one and a half times the size of India. China used weather manipulation to ensure clear skies during the 2008 Olympics in Beijing. I have quoted from US military documents detailing how to employ weather manipulation as a weapon of war and they did that in the 1960s and 70s during the

conflict in Vietnam with Operation Popeye manipulating monsoon rains for military purposes. Why would there be international treaties on weather modification if it wasn't possible? Of course it is. Weather is energetic information and it can be changed. How was the climate hoax pulled off? See 'Covid' If you can get billions to believe in a 'virus' that doesn't exist you can get them to believe in human-caused climate change that doesn't exist. Both are being used by the Cult to transform global society in the way it has long planned. Both hoaxes have been achieved in preŕy much the same way. First you declare a lie is a fact. There's a 'virus' you call SARS-Cov-2 or humans are warming the planet with their behaviour. Next this becomes, via Cult networks, the foundation of government, academic and science policy and belief. Those who parrot the mantra are given big grants to produce research that confirms the narrative is true and ever more 'symptoms' are added to make the 'virus'/'climate change' sound even more scary. Scientists and researchers who challenge the narrative have their grants withdrawn and their careers destroyed. The media promote the lie as the unquestionable truth and censor those with an alternative view or evidence. A great percentage of the population believe what they are told as the lie becomes an everybody-knows-that and the believing-masses turn on those with a mind of their own. The technique has been used endlessly throughout human history. Wokers are the biggest promoters of the climate lie and 'Covid' fascism because their minds are owned by the Cult; their sense of self-righteous self-purity knows no bounds; and they exist in a bubble of reality in which facts are irrelevant and only get in the way of looking without seeing. Running through all of this like veins in a blue cheese is control of information, which means control of perception, which means control of behaviour, which collectively means control of human society. The Cult owns the global media and Silicon Valley fascists for the simple reason that it has to. Without control of information it can't control perception and through that human society. Examine every facet of the Cult agenda and you will see that anything supporting its introduction is never censored while anything pushing back is always censored. I say again: Psychopaths that know that follow their orders must trot along behind them into the same

dock. 'I was just following orders' didn't work the first time and it must not work now. Nuremberg trials must be held all over the world before public juries for politicians, government officials, police, compliant doctors, scientists and virologists, and all Cult operatives such as Gates, Tedros, Fauci, Vallance, Whîjy, Ferguson, Zuckerberg, Wojcicki, Brin, Page, Dorsey, the whole damn lot of them – including, no especially, the psychopath psychologists. Without them and the brainless, gutless excuses for journalists that have repeated their lies, none of this could be happening. Nobody can be allowed to escape justice for the psychological and economic Armageddon they are all responsible for visiting upon the human As for the compliant, unquestioning, swathes of humanity, and the self-obsessed, all-knowing ignorance of the Wokers ... don't start me. God help their kids. God help their grandkids. God help them. We must have it? So what is it? Well I won't back down. No, I won't back down. You can stand me up at the Gates of Hell. But I won't back down will now focus on the genetically-manipulating 'Covid vaccines' which do not meet this official definition of a vaccine by the US Centers for Disease Control (CDC): 'A product that stimulates a person's immune system to produce immunity to a specific disease, protecting the person from that disease.' On that basis 'Covid vaccines' are not a vaccine in that the makers don't even claim they stop infection or transmission. They are instead part of a multi-levelled conspiracy to change the nature of the human body and what it means to be 'human' and to depopulate an enormous swathe of humanity. What I shall call Human 1.0 is on the cusp of becoming Human 2.0 and for very sinister reasons. Before I get to the 'Covid vaccine' in detail here's some background to vaccines in general. Government regulators do not test vaccines – the makers do – and the makers control which data is revealed and which isn't. Children in America are given 50 vaccine doses by age six and 69 by age 19 and the effect of the whole combined schedule has never been tested. Autoimmune diseases when the immune system aĴacks its own body have soared in the mass vaccine era and so has disease in general in children and the young. Why wouldn't this be the case when vaccines target the immune system? The US government gave Big Pharma drug companies immunity from prosecution for vaccine death

and injury in the 1986 National Childhood Vaccine Injury Act (NCVIA) and since then the government (taxpayer) has been funding compensation for the consequences of Big Pharma vaccines. The criminal and satanic drug giants can't lose and the vaccine schedule has increased dramatically since 1986 for this reason. There is no incentive to make vaccines safe and a big incentive to make money by introducing ever more. Even against a ridiculously high bar to prove vaccine liability, and with the government controlling the hearing in which it is being challenged for compensation, the vaccine court has so far paid out more than \$4 billion. These are the vaccines we are told are safe and psychopaths like Zuckerberg censor posts saying otherwise. The immunity law was even justified by a ruling that vaccines by their nature were 'unavoidably unsafe'. Check out the ingredients of vaccines and you will be shocked if you are new to this. They put that in children's bodies?? What?? Try aluminium, a brain toxin connected to dementia, aborted foetal tissue and formaldehyde which is used to embalm corpses. World- renowned aluminium expert Christopher Exley had his research into the health effect of aluminium in vaccines shut down by Keele University in the UK when it began taking funding from the Bill and Melinda Gates Foundation. Research when diseases 'eradicated' by vaccines began to decline and you will find the fall began long before the vaccine was introduced. Sometimes the fall even plateaued after the vaccine. Diseases like scarlet fever for which there was no vaccine declined in the same way because of environmental and other factors. A perfect case in point is the polio vaccine. Polio began when lead arsenate was first sprayed as an insecticide and residues remained in food products. Spraying started in 1892 and the first US polio epidemic came in Vermont in 1894. The simple answer was to stop spraying, but Rockefeller-created Big Pharma had a better idea. Polio was decreed to be caused by the poliovirus which 'spreads from person to person and can infect a person's spinal cord'. Lead arsenate was replaced by the lethal DDT which had the same effect of causing paralysis by damaging the brain and central nervous system. Polio plummeted when DDT was reduced and then banned, but the vaccine is still given the credit for something it didn't do. Today by far the biggest cause of polio is the vaccines promoted by Bill

Gates. Vaccine justice campaigner Robert Kennedy Jr, son of assassinated (by the Cult) US Attorney General Robert Kennedy, In 2017, the World Health Organization (WHO) reluctantly admitted that the global explosion in polio is predominantly vaccine strain. The most frightening epidemics in Congo, Afghanistan, and the Philippines, are all linked to vaccines. In fact, by 2018, 70% of global polio cases were vaccine strain. Vaccines make fortunes for Cult-owned Gates and Big Pharma while undermining the health and immune systems of the population. We had a glimpse of the mentality behind the Big Pharma cartel with a report on WION (World is One News), an international English language TV station based in India, which exposed the extraordinary behaviour of US drug company Pfizer over its 'Covid vaccine'. The WION report told how Pfizer had made fantastic demands of Argentina, Brazil and other countries in return for its 'vaccine'. These included immunity from prosecution, even for Pfizer negligence, government insurance to protect Pfizer from law suits and handing over as collateral sovereign assets of the country to include Argentina's bank reserves, military bases and embassy buildings. Pfizer demanded the same of Brazil in the form of waiving sovereignty of its assets abroad; exempting Pfizer from Brazilian laws; and giving Pfizer immunity from all civil liability. This is a 'vaccine' developed with government funding. Big Pharma is evil incarnate as a creation of the Cult and all must be handed tickets to Nuremberg. Phantom 'vaccine' for a phantom 'disease' I'll expose the 'Covid vaccine' fraud and then go on to the wider background of why the Cult has set out to 'vaccinate' every man, woman and child on the planet for an alleged 'new disease' with a survival rate of 99.77 percent (or more) even by the grotesquely- manipulated figures of the World Health Organization and Johns Hopkins University. The 'infection' to 'death' ratio is 0.23 to 0.15 percent according to Stanford epidemiologist Dr John Ioannidis and while estimates vary the danger remains tiny. I say that if the truth be told the fake infection to fake death ratio is zero. Never mind all the evidence I have presented here and in The Answer that there is no 'virus' let us just focus for a moment on that death-rate figure of say 0.23 percent. The figure includes all those worldwide who have tested positive with a test not testing for the 'virus' and then died within 28 days or even

longer of any other cause – any other cause. Now subtract all those illusory 'Covid' deaths on the global data sheets from the 0.23 percent. What do you think you would be left with? Zero. A vaccination has never been successfully developed for a so-called coronavirus. They have all failed at the animal testing stage when they caused hypersensitivity to what they were claiming to protect against and made the impact of a disease far worse. Cult- owned vaccine corporations got around that problem this time by bypassing animal trials, going straight to humans and making the length of the 'trials' before the public rollout as short as they could get away with. Normally it takes five to ten years or more to develop vaccines that still cause demonstrable harm to many people and that's without including the long-term effects that are never officially connected to the vaccination. 'Covid' non-vaccines have been officially produced and approved in a matter of months from a standing start and part of the reason is that (a) they were developed before the 'Covid' hoax began and (b) they are based on computer programs and not natural sources. Official non-trials were so short that government agencies gave emergency, not full, approval. 'Trials' were not even completed and full approval cannot be secured until they are. Public 'Covid vaccination' is actually a continuation of the trial. Drug company 'trials' are not scheduled to end until 2023 by which time a lot of people are going to be dead. Data on which government agencies gave this emergency approval was supplied by the Big Pharma corporations themselves in the form of Pfizer/BioNTech, AstraZeneca, Moderna, Johnson & Johnson, and others, and this is the case with all vaccines. By its very nature emergency approval means drug companies do not have to prove that the 'vaccine' is 'safe and effective'. How could they with trials way short of complete? Government regulators only have to believe that they could be safe and effective. It is criminal manipulation to get products in circulation with no testing worth the name. Agencies giving that approval are infested with Big Pharma-connected people and they act in the interests of Big Pharma (the Cult) and not the public about whom they do not give a damn. More human lab rats 'Covid vaccines' produced in record time by Pfizer/BioNTech and Moderna employ a technique never approved before for use on humans. They are known as



mRNA 'vaccines' and inject a synthetic version of 'viral' mRNA or 'messenger RNA'. The key is in the term 'messenger'. The body works, or doesn't, on the basis of information messaging. Communications are constantly passing between and within the genetic system and the brain. Change those messages and you change the state of the body and even its very nature and you can change psychology and behaviour by the way the brain processes information. I think you are going to see significant changes in personality and perception of many people who have had the 'Covid vaccine' synthetic potions. Insider Aldous Huxley predicted the following in 1961 and mRNA 'vaccines' can be included in the term 'pharmacological methods': There will be, in the next generation or so, a pharmacological method of making people love their servitude, and producing dictatorship without tears, so to speak, producing a kind of painless concentration camp for entire societies, so that people will in fact have their own liberties taken away from them, but rather enjoy it, because they will be distracted from any desire to rebel by propaganda or brainwashing, or brainwashing enhanced by pharmacological methods. And this seems to be the final revolution. Apologists claim that mRNA synthetic 'vaccines' don't change the DNA genetic blueprint because RNA does not affect DNA only the other way round. This is so disingenuous. A process called 'reverse transcription' can convert RNA into DNA and be integrated into DNA in the cell nucleus. This was highlighted in December, 2020, by scientists at Harvard and Massachusetts Institute of Technology (MIT). Geneticists report that more than 40 percent of mammalian genomes results from reverse transcription. On the most basic level if messaging changes then that sequence must lead to changes in DNA which is receiving and transmitting those communications. How can introducing synthetic material into cells not change the cells where DNA is located? The process is known as transfection which is defined as 'a technique to insert foreign nucleic acid (DNA or RNA) into a cell, typically with the intention of altering the properties of the cell'. Researchers at the Sloan Kettering Institute in New York found that changes in messenger RNA can deactivate tumour-suppressing proteins and thereby promote cancer. This is what happens when you mess with messaging. 'Covid vaccine' maker Moderna was founded in 2010

by Canadian stem cell biologist Derrick J. Rossi after his breakthrough discovery in the field of transforming and reprogramming stem cells. These are neutral cells that can be programmed to become any cell including sperm cells. Moderna was therefore founded on the principle of genetic manipulation and has never produced any vaccine or drug before its genetically-manipulating synthetic 'Covid' shot. Look at the name – Mode-RNA or Modify-RNA. Another important point is that the US Supreme Court has ruled that genetically-modified DNA, or complementary DNA (cDNA) synthesized in the laboratory from messenger RNA, can be patented and owned. These psychopaths are Cells replicate synthetic mRNA in the 'Covid vaccines' and in theory the body is tricked into making antigens which trigger antibodies to target the 'virus spike proteins' which as Dr Tom Cowan said have never been seen. Cut the crap and these 'vaccines' deliver self-replicating synthetic material to the cells with the effect of changing human DNA. The more of them you have the more that process is compounded while synthetic material is all the time self-replicating. 'Vaccine'-maker Moderna describes mRNA as 'like software for the cell' and so they are messing with the body's software. What happens when you change the software in a computer? Everything changes. For this reason the Cult is preparing a production line of mRNA 'Covid vaccines' and a long list of excuses to use them as with all the 'variants' of a 'virus' never shown to exist. The plan is further to transfer the mRNA technique to other vaccines mostly given to children and young people. The cumulative consequences will be a transformation of human DNA through a constant infusion of synthetic genetic material which will kill many and change the rest. Now consider that governments that have given emergency approval for a vaccine that's not a vaccine; never been approved for humans before; had no testing worth the name; and the makers have been given immunity from prosecution for any deaths or adverse effects suffered by the public. The UK government awarded permanent legal indemnity to itself and its employees for harm done when a patient is being treated for 'Covid-19' or 'suspected Covid-19'. That is quite a thought when these are possible 'side-effects' from the 'vaccine' (they are not 'side', they are effects) listed by the US Food and Drug Administration: Guillain-Barre syndrome; acute

disseminated encephalomyelitis; transverse myelitis; encephalitis; myelitis; encephalomyelitis; meningoencephalitis; meningitis; encephalopathy; convulsions; seizures; stroke; narcolepsy; cataplexy; anaphylaxis; acute myocardial infarction (heart attack); myocarditis; pericarditis; autoimmune disease; death; implications for pregnancy, and birth outcomes; other acute demyelinating diseases; non anaphylactic allergy reactions; thrombocytopenia ; disseminated intravascular coagulation; venous thromboembolism; arthritis; arthralgia; joint pain; Kawasaki disease; multisystem inflammatory syndrome in children; vaccine enhanced disease. The latter is the way the 'vaccine' has the potential to make diseases far worse than they would otherwise be. UK doctor and freedom campaigner Vernon Coleman described the conditions in this list as 'all unpleasant, most of them very serious, and you can't get more serious than death'. The thought that anyone at all has had the 'vaccine' in these circumstances is testament to the potential that humanity has for clueless, unquestioning, stupidity and for many that programmed stupidity has already been terminal. An insider speaks Dr Michael Yeadon is a former Vice President, head of research and Chief Scientific Adviser at vaccine giant Pfizer. Yeadon worked on the inside of Big Pharma, but that did not stop him becoming a vocal critic of 'Covid vaccines' and their potential for multiple harms, including infertility in women. By the spring of 2021 he went much further and even used the no, no, term 'conspiracy'. When you begin to see what is going on it is impossible not to do so. Yeadon spoke out in an interview with freedom campaigner James Delingpole and I mentioned earlier how he said that no one had samples of 'the virus'. He explained that the mRNA technique originated in the anti- cancer field and ways to turn on and off certain genes which could be advantageous if you wanted to stop cancer growing out of control. 'That's the origin of them. They are a very unusual application, really.' Yeadon said that treating a cancer patient with an aggressive procedure might be understandable if the alternative was dying, but it was quite another thing to use the same technique as a public health measure. Most people involved wouldn't catch the infectious agent you were vaccinating against and if they did they probably wouldn't die: If you are really using it as a public health measure you really want to as close as

you can get to zero side-effects ... I find it odd that they chose techniques that were really cutting their teeth in the field of oncology and I'm worried that in using gene-based vaccines that have to be injected in the body and spread around the body, get taken up into some cells, and the regulators haven't quite told us which cells they get taken up into ... you are going to be generating a wide range of responses ... with multiple steps each of which could go well or I doubt the Cult intends it to go well. Yeadon said that you can put any gene you like into the body through the 'vaccine'. 'You can certainly give them a gene that would do them some harm if you wanted.' I was intrigued when he said that when used in the cancer field the technique could turn genes on and off. I explore this process in The Answer and with different genes having different functions you could create mayhem – physically and psychologically – if you turned the wrong ones on and the right ones off. I read reports of an experiment by researchers at the University of Washington's school of computer science and engineering in which they encoded DNA to infect computers. The body is itself a biological computer and if human DNA can inflict damage on a computer why can't the computer via synthetic material mess with the human body? It can. The Washington research team said it was possible to insert malicious malware into 'physical DNA strands' and corrupt the computer system of a gene sequencing machine as it 'reads gene letters and stores them as binary digits 0 and 1'. They concluded that hackers could one day use blood or spit samples to access computer systems and obtain sensitive data from police forensics labs or infect genome files. It is at this level of digital interaction that synthetic 'vaccines' need to be seen to get the full picture and that will become very clear later on. Michael Yeadon said it made no sense to give the 'vaccine' to younger people who were in no danger from the 'virus'. What was the benefit? It was all downside with potential effects: The fact that my government in what I thought was a civilised, rational country, is raining [the 'vaccine'] on people in their 30s and 40s, even my children in their 20s, they're getting letters and phone calls, I know this is not right and any of you doctors who are vaccinating you know it's not right, too. They are not at risk. They are not at risk from the disease, so you are now hoping that the side-effects are so rare that you get away with it.

You don't give new technology ... that you don't understand to 100 percent of the population. Blood clot problems with the AstraZeneca 'vaccine' have been affecting younger people to emphasise the downside risks with no benefit. AstraZeneca's version, produced with Oxford University, does not use mRNA, but still gets its toxic cocktail inside cells where it targets DNA. The Johnson & Johnson 'vaccine' which uses a similar technique has also produced blood clot effects to such an extent that the United States paused its use at one point. They are all 'gene therapy' (cell modification) procedures and not 'vaccines'. The truth is that once the content of these injections enter cells we have no idea what the effect will be. People can speculate and some can give very educated opinions and that's good. In the end, though, only the makers know what their potions are designed to do and even they won't know every last consequence. Michael Yeadon was 'Everyone's mute', he said. Doctors in the NHS must know this was not right, coming into work and injecting people. 'I don't know how they sleep at night. I know I couldn't do it. I know that if I were in that position I'd have to quit.' He said he knew enough about toxicology to know this was not a good risk-benefit. Yeadon had spoken to seven or eight university professors and all except two would not speak out publicly. Their universities had a policy that no one said anything that countered the government and its medical advisors. They were afraid of losing their government grants. This is how intimidation has been used to silence the truth at every level of the system. I say silence, but these people could still speak out if they made that choice. Yeadon called them 'moral cowards' - 'This is about your children and grandchildren's lives and you have just buggered off and left it.' Some of his most powerful comments related to the alleged 'variants' being used to instil more fear, justify more lockdowns, and introduce more 'vaccines'. He said government claims about 'variants' were nonsense. He had checked the alleged variant 'codes' and they were 99.7 percent identical to the 'original'. This was the human identity difference equivalent to putting a baseball cap on and off or wearing it the other way round. A 0.3 percent difference would make it impossible for that 'variant' to escape immunity from the 'original'. This made no sense of having new 'vaccines' for 'variants'. He said there would have to be at least a 30 percent

difference for that to be justified and even then he believed the immune system would still recognise what it was. Gates-funded 'variant modeller' and 'vaccine'-pusher John Edmunds might care to comment. Yeadon said drug companies were making new versions of the 'vaccine' as a 'top up' for 'variants'. Worse than that, he said, the 'regulators' around the world like the MHRA in the UK had got together and agreed that because 'vaccines' for 'variants' were so similar to the first 'vaccines' they did not have to do safety studies. How transparently sinister that is. This is when Yeadon said: 'There is a conspiracy here.' There was no need for another vaccine for 'variants' and yet we were told that there was and the country had shut its borders because of them. 'They are going into hundreds of millions of arms without passing 'go' or any regulator. Why did they do that? Why did they pick this method of making the vaccine?' The reason had to be something bigger than that it seemed and 'it's not protection against the virus'. It's was a far bigger project that meant politicians and advisers were willing to do things and not do things that knowingly resulted in avoidable deaths – 'that's already happened when you think about lockdown and deprivation of health care for a year.' He spoke of people prepared to do something that results in the avoidable death of their fellow human beings and it not bother them. This is the penny-drop I have been working to get across for more than 30 years – the level of pure evil we are dealing with. Yeadon said his friends and associates could not believe there could be that much evil, but he reminded them of Stalin, Pol Pot and Hitler and of what Stalin had said: 'One death is a tragedy. A million? A statistic.' He could not think of a benign explanation for why you need top-up vaccines 'which I'm sure you don't' and for the regulators 'to just get out of the way and wave them through'. Why would the regulators do that when they were still wrestling with the dangers of the 'parent' vaccine? He was clearly shocked by what he had seen since the 'Covid' hoax began and now he was thinking the previously unthinkable: If you wanted to depopulate a significant proportion of the world and to do it in a way that doesn't involve destruction of the environment with nuclear weapons, poisoning everyone with anthrax or something like that, and you wanted plausible deniability while you had a multi-year infectious disease crisis, I actually don't think

you could come up with a better plan of work than seems to be in front of me. I can't say that's what they are going to do, but I can't. He said he never thought that they would get rid of 99 percent of humans, but now he wondered. 'If you wanted to that this would be a hell of a way to do it – it would be unstoppable folks.' Yeadon had concluded that those who submitted to the 'vaccine' would be allowed to have some kind of normal life (but for how long?) while screws were tightened to coerce and mandate the last few percent. 'I think they'll put the rest of them in a prison camp. I wish I was wrong, but I don't think I am.' Other points he made included: There were no coronavirus vaccines then suddenly they all come along at the same time; we have no idea of the long term affect with trials so short; coercing or forcing people to have medical procedures is against the Nuremberg Code instigated when the Nazis did just that; people should at least delay having the 'vaccine'; a quick Internet search confirms that masks don't reduce respiratory viral transmission and 'the government knows that'; they have smashed civil society and they know that, too; two dozen peer-reviewed studies show no connection between lockdown and reducing deaths; he knew from personal friends the elite were still flying around and going on holiday while the public were locked down; the elite were not having the 'vaccines'. He was also asked if 'vaccines' could be made to target difference races. He said he didn't know, but the document by the Project for the New American Century in September, 2000, said developing 'advanced forms of biological warfare that can target specific genotypes may transform biological warfare from the realm of terror to a politically useful tool.' Oh, they're evil all right. Of that we can be absolutely sure. Another cull of old people We have seen from the CDC definition that the mRNA 'Covid vaccine' is not a vaccine and nor are the others that claim to reduce 'severity of symptoms' in some people, but not protect from infection or transmission. What about all the lies about returning to 'normal' if people were 'vaccinated'? If they are not claimed to stop infection and transmission of the alleged 'virus', how does anything change? This was all lies to manipulate people to take the jabs and we are seeing that now with masks and distancing still required for the 'vaccinated'. How did they think that elderly people with fragile health and immune responses were going

to be affected by infusing their cells with synthetic material and other toxic substances? They knew that in the short and long term it would be devastating and fatal as the culling of the old that began with the first lockdowns was continued with the 'vaccine'. Death rates in care homes soared immediately residents began to be 'vaccinated' – infused with synthetic material. Brave and committed whistleblower nurses put their careers at risk by exposing this truth while the rest kept their heads down and their mouths shut to put their careers before those they are supposed to care for. A long-time American Certified Nursing Assistant who gave his name as James posted a video in which he described emotionally what happened in his care home when vaccination began. He said that during 2020 very few residents were sick with 'Covid' and no one died during the entire year; but shortly after the Pfizer mRNA injections 14 people died within two weeks and many others were near death. 'They're dropping like flies', he said. Residents who walked on their own before the shot could no longer and they had lost their ability to conduct an intelligent conversation. The home's management said the sudden deaths were caused by a 'super-spreader' of 'Covid-19'. Then how come, James asked, that residents who refused to take the injections were not sick? It was a case of inject the elderly with mRNA synthetic potions and blame their illness and death that followed on the 'virus'. James described what was happening in care homes as 'the greatest crime of genocide this country has ever seen'. Remember the NHS staff nurse from earlier who used the same word 'genocide' for what was happening with the 'vaccines' and that it was an 'act of human annihilation'. A UK care home whistleblower told a similar story to James about the effect of the 'vaccine' in deaths and 'outbreaks' of illness dubbed 'Covid' after getting the jab. She told how her care home management and staff had zealously imposed government regulations and no one was allowed to even question the official narrative let alone speak out against it. She said the NHS was even worse. Again we see the results of reframing. A worker at a local care home where I live said they had not had a single case of 'Covid' there for almost a year and when the residents were 'vaccinated' they had 19 positive cases in two weeks with eight dying. It's not the 'vaccine' – honest The obvious cause and



effect was being ignored by the media and most of the public. Australia's health minister Greg Hunt (a former head of strategy at the World Economic Forum) was admitted to hospital after he had the 'vaccine'. He was suffering according to reports from the skin infection 'cellulitis' and it must have been a severe case to have warranted days in hospital. Immediately the authorities said this was nothing to do with the 'vaccine' when an effect of some vaccines is a 'cellulitis-like reaction'. We had families of perfectly healthy old people who died after the 'vaccine' saying that if only they had been given the 'vaccine' earlier they would still be alive. As a numbskull rating that is off the chart. A father of four 'died of Covid' at aged 48 when he was taken ill two days after having the 'vaccine'. The man, a health administrator, had been 'shielding during the pandemic' and had 'not really left the house' until he went for the 'vaccine'. Having the 'vaccine' and then falling ill and dying does not seem to have qualified as a possible cause and effect and 'Covid-19' went on his death certificate. His family said they had no idea how he 'caught the virus'. A family member said: 'Tragically, it could be that going for a vaccination ultimately led to him catching Covid ...The sad truth is that they are never going to know where it came from.' The family warned people to remember that the virus still existed and was 'very real'. So was their stupidity. Nurses and doctors who had the first round of the 'vaccine' were collapsing, dying and ending up in a hospital bed while they or their grieving relatives were saying they'd still have the 'vaccine' again despite what happened. I kid you not. You mean if your husband returned from the dead he'd have the same 'vaccine' again that killed Doctors at the VCU Medical Center in Richmond, Virginia, said the Johnson & Johnson 'vaccine' was to blame for a man's skin peeling off. Patient Richard Terrell said: 'It all just happened so fast. My skin peeled off. It's still coming off on my hands now.' He said it was stinging, burning and itching and when he bent his arms and legs it was very painful with 'the skin swollen and rubbing against itself'. Pfizer/BioNTech and Moderna vaccines use mRNA to change the cell while the Johnson & Johnson version uses DNA in a process similar to AstraZeneca's technique. Johnson & Johnson and AstraZeneca have both had their 'vaccines' paused by many countries after causing serious blood problems. Terrell's doctor Fnu Nutan

said he could have died if he hadn't got medical attention. It sounds terrible so what did Nutan and Terrell say about the 'vaccine' now? Oh, they still recommend that people have it. A nurse in a hospital bed 40 minutes after the vaccination and unable to swallow due to throat swelling was told by a doctor that he lost mobility in his arm for 36 hours following the vaccination. What did he say to the ailing nurse? 'Good for you for getting the vaccination.' We are dealing with a serious form of cognitive dissonance madness in both public and medical staff. There is a remarkable correlation between those having the 'vaccine' and trumpeting the fact and suffering bad happenings shortly afterwards. Witold Rogiewicz, a Polish doctor, made a video of his 'vaccination' and ridiculed those who were questioning its safety and the intentions of Bill Gates: 'Vaccinate yourself to protect yourself, your loved ones, friends and also patients. And to mention quickly I have info for anti-vaxxers and anti-Covidors if you want to contact Bill Gates you can do this through me.' He further ridiculed the dangers of 5G. Days later he was dead, but naturally the vaccination wasn't mentioned in the verdict of 'heart attack'. Lies, lies and more lies So many members of the human race have slipped into extreme states of insanity and unfortunately they include reframed doctors and nursing staff. Having a 'vaccine' and dying within minutes or hours is not considered a valid connection while death from any cause within 28 days or longer of a positive test with a test not testing for the 'virus' means 'Covid-19' goes on the death certificate. How could that 'vaccine'-death connection not have been made except by calculated deceit? US figures in the initial rollout period to February 12th, 2020, revealed that a third of the deaths reported to the CDC after 'Covid vaccines' happened within 48 hours. Five men in the UK suffered an 'extremely rare' blood clot problem after having the AstraZeneca 'vaccine', but no causal link was established said the Gates-funded Medicines and Healthcare products Regulatory Agency (MHRA) which had given the 'vaccine' emergency approval to be used. Former Pfizer executive Dr Michael Yeadon explained in his interview how the procedures could cause blood coagulation and clots. People who should have been at no risk were dying from blood clots in the brain and he said he had heard from medical doctor friends that people were suffering from skin bleeding and

massive headaches. The AstraZeneca 'shot' was stopped by some 20 countries over the blood clotting issue and still the corrupt MHRA, the European Medicines Agency (EMA) and the World Health Organization said that it should continue to be given even though the EMA admitted that it 'still cannot rule out definitively' a link between blood clotting and the 'vaccine'. Later Marco Cavaleri, head of EMA vaccine strategy, said there was indeed a clear link between the 'vaccine' and thrombosis, but they didn't know why. So much for the trials showing the 'vaccine' is safe. Blood clots were affecting younger people who would be under virtually no danger from 'Covid' even if it existed which makes it all the more stupid and sinister. The British government responded to public alarm by wheeling out June Raine, the terrifyingly weak infant school headmistress sound-alike who heads the UK MHRA drug 'regulator'. The idea that she would stand up to Big Pharma and government pressure is laughable and she told us that all was well in the same way that she did when allowing untested, never-used-on-humans-before, genetically-manipulating 'vaccines' to be exposed to the public in the first place. Mass lying is the new normal of the 'Covid' era. The MHRA later said 30 cases of rare blood clots had by then been connected with the AstraZeneca 'vaccine' (that means a lot more in reality) while stressing that the benefits of the jab in preventing 'Covid-19' outweighed any risks. A more ridiculous and disingenuous statement with callous disregard for human health it is hard to contemplate. Immediately after the mendacious 'all-clears' two hospital workers in Denmark experienced blood clots and cerebral haemorrhaging following the AstraZeneca jab and one died. Top Norwegian health official Pål Andre Holme said the 'vaccine' was the only common factor: 'There is nothing in the patient history of these individuals that can give such a powerful immune response ... I am confident that the antibodies that we have found are the cause, and I see no other explanation than it being the vaccine which triggers it.' Strokes, a clot or bleed in the brain, were clearly associated with the 'vaccine' from word of mouth and whistleblower reports. Similar consequences followed with all these 'vaccines' that we were told were so safe and as the numbers grew by the day it was clear we were witnessing human carnage. Learning the hard way A woman interviewed by

UKColumn told how her husband suffered dramatic health effects after the vaccine when he'd been in good health all his life. He went from being a little unwell to losing all feeling in his legs and experiencing 'excruciating pain'. Misdiagnosis followed twice at Accident and Emergency (an 'allergy' and 'sciatica') before he was admitted to a neurology ward where doctors said his serious condition had been caused by the 'vaccine'. Another seven 'vaccinated' people were apparently being treated on the same ward for similar symptoms. The woman said he had the 'vaccine' because they believed media claims that it was safe. 'I didn't think the government would give out a vaccine that does this to somebody; I believed they would be bringing out a vaccination that would be safe.' What a tragic way to learn that lesson. Another woman posted that her husband was transporting stroke patients to hospital on almost every shift and when he asked them if they had been 'vaccinated' for 'Covid' they all replied 'yes'. One had a 'massive brain bleed' the day after his second dose. She said her husband reported the 'just been vaccinated' information every time to doctors in A and E only for them to ignore it, make no notes and appear annoyed that it was even mentioned. This particular report cannot be verified, but it expresses a common theme that confirms the monumental underreporting of 'vaccine' consequences. Interestingly as the 'vaccines' and their brain blood clot/stroke consequences began to emerge the UK National Health Service began a publicity campaign telling the public what to do in the event of a stroke. A Scottish NHS staff nurse who quit in disgust in March, 2021, said: I have seen traumatic injuries from the vaccine, they're not getting reported to the yellow card [adverse reaction] scheme, they're treating the symptoms, not asking why, why it's happening. It's just treating the symptoms and when you speak about it you're dismissed like you're crazy, I'm not crazy, I'm not crazy because every other colleague I've spoken to is terrified to speak out, they've had enough. Videos appeared on the Internet of people uncontrollably shaking after the 'vaccine' with no control over muscles, limbs and even their face. A Scottish mother broke out in a severe rash all over her body almost immediately after she was given the AstraZeneca 'vaccine'. The pictures were horrific. Leigh King, a 41-year-old hairdresser from Lanarkshire said: 'Never in my life was I prepared for what I was

about to experience ... My skin was so sore and constantly hot ... I have never felt pain like this ...' But don't you worry, the 'vaccine' is perfectly safe. Then there has been the effect on medical staff who have been pressured to have the 'vaccine' by psychopathic 'health' authorities and government. A London hospital consultant who gave the name K. Polyakova wrote this to the British Medical Journal or BMJ: I am currently struggling with ... the failure to report the reality of the morbidity caused by our current vaccination program within the health service and staff population. The levels of sickness after vaccination is unprecedented and staff are getting very sick and some with neurological symptoms which is having a huge impact on the health service function. Even the young and healthy are off for days, some for weeks, and some requiring medical treatment. Whole teams are being taken out as they went to get vaccinated together. Mandatory vaccination in this instance is stupid, unethical and irresponsible when it comes to protecting our staff and public health. We are in the voluntary phase of vaccination, and encouraging staff to take an unlicensed product that is impacting on their immediate health ... it is clearly stated that these vaccine products do not offer immunity or stop transmission. In Not to protect health that's for sure. Medical workers are lauded by governments for agenda reasons when they couldn't give a toss about them any more than they can for the population in general. Schools across America faced the same situation as they closed due to the high number of teachers and other staff with bad reactions to the Pfizer/BioNTech, Moderna, and Johnson & Johnson 'Covid vaccines' all of which were linked to death and serious adverse effects. The BMJ took down the consultant's comments pretty quickly on the grounds that they were being used to spread 'disinformation'. They were exposing the truth about the 'vaccine' was the real reason. The cover-up is breathtaking. Hiding the evidence The scale of the 'vaccine' death cover-up worldwide can be confirmed by comparing official figures with the personal experience of the public. I heard of many people in my community who died immediately or soon after the vaccine that would never appear in the media or even likely on the official totals of 'vaccine' fatalities and adverse reactions when only about ten percent are estimated to be reported and I have seen some estimates as low as

one percent in a Harvard study. In the UK alone by April 29th, 2021, some 757,654 adverse reactions had been officially reported from the Pfizer/BioNTech, Oxford/AstraZeneca and Moderna 'vaccines' with more than a thousand deaths linked to jabs and that means an estimated ten times this number in reality from a ten percent reporting rate percentage. That's seven million adverse reactions and 10,000 potential deaths and a one percent reporting rate would be ten times those figures. In 1976 the US government pulled the swine flu vaccine after 53 deaths. The UK data included a combined 10,000 eye disorders from the 'Covid vaccines' with more than 750 suffering visual impairment or blindness and again multiply by the estimated reporting percentages. As 'Covid cases' officially fell hospitals virtually empty during the 'Covid crisis' began to fill up with a range of other problems in the wake of the 'vaccine' rollout. The numbers across America have also been catastrophic. Deaths linked to all types of vaccine increased by 6,000 percent in the first quarter of 2021 compared with 2020. A 39-year-old woman from Ogden, Utah, died four days after receiving a second dose of Moderna's 'Covid vaccine' when her liver, heart and kidneys all failed despite the fact that she had no known medical issues or conditions. Her family sought an autopsy, but Dr Erik Christensen, Utah's chief medical examiner, said proving vaccine injury as a cause of death almost never happened. He could think of only one instance where an autopsy would name a vaccine as the official cause of death and that would be anaphylaxis where someone received a vaccine and died almost instantaneously. 'Short of that, it would be difficult for us to definitively say this is the vaccine,' Christensen said. If that is true this must be added to the estimated ten percent (or far less) reporting rate of vaccine deaths and serious reactions and the conclusion can only be that vaccine deaths and serious reactions – including these 'Covid' potions' – are phenomenally understated in official figures. The same story can be found everywhere. Endless accounts of deaths and serious reactions among the public, medical and care home staff while official figures did not even begin to. Professional script-reader Dr David Williams, a 'top public-health official' in Ontario, Canada, insulted our intelligence by claiming only four serious adverse reactions and no deaths from the more than 380,000 vaccine doses

then given. This bore no resemblance to what people knew had happened in their own circles and we had Dirk Huyer in charge of getting millions vaccinated in Ontario while at the same time he was Chief Coroner for the province investigating causes of death including possible death from the vaccine. An aide said he had stepped back from investigating deaths, but evidence indicated otherwise. Rosemary Frei, who secured a Master of Science degree in molecular biology at the Faculty of Medicine at Canada's University of Calgary before turning to investigative journalism, was one who could see that official figures for 'vaccine' deaths and reactions made no sense. She said that doctors seldom reported adverse events and when people got really sick or died after getting a vaccination they would attribute that to anything except the vaccines. It had been that way for years and anyone who wondered aloud whether the 'Covid vaccines' or other shots cause harm is immediately branded as 'anti-vax' and 'anti-science'. This was 'career-threatening' for health professionals. Then there was the huge pressure to support the push to 'vaccinate' billions in the quickest time possible. Frei said: So that's where we're at today. More than half a million vaccine doses have been given to people in Ontario alone. The rush is on to vaccinate all 15 million of us in the province by September. And the mainstream media are screaming for this to be sped up even more. That all adds up to only a very slim likelihood that we're going to be told the truth by officials about how many people are getting sick or dying from the vaccines. What is true of Ontario is true of everywhere. They KNEW – and still did it The authorities knew what was going to happen with multiple deaths and adverse reactions. The UK government's Gates-funded and Big Pharma-dominated Medicines and Healthcare products Regulatory Agency (MHRA) hired a company to employ AI in compiling the projected reactions to the 'vaccine' that would otherwise be uncountable. The request for applications said: 'The MHRA urgently seeks an Artificial Intelligence (AI) software tool to process the expected high volume of Covid-19 vaccine Adverse Drug Reaction ...' This was from the agency, headed by the disingenuous June Raine, that gave the 'vaccines' emergency approval and the company was hired before the first shot was given. 'We are going to kill and maim you – is that okay?' 'Oh, yes, perfectly fine – I'm

very grateful, thank you, doctor.' The range of 'Covid vaccine' adverse reactions goes on for page after page in the MHRA criminally underreported 'Yellow Card' system and includes affects to eyes, ears, skin, digestion, blood and so on. Raine's MHRA amazingly claimed that the 'overall safety experience ... is so far as expected from the clinical trials'. The death, serious adverse effects, deafness and blindness were expected? When did they ever mention that? If these human tragedies were expected then those that gave approval for the use of these 'vaccines' must be guilty of crimes against humanity including murder – a definition of which is 'killing a person with malice aforethought or with recklessness manifesting extreme indifference to the value of human life.' People involved at the MHRA, the CDC in America and their equivalent around the world must go before Nuremberg trials to answer for their callous inhumanity. We are only talking here about the immediate effects of the 'vaccine'. The longer-term impact of the DNA synthetic manipulation is the main reason they are so hysterically desperate to inoculate the entire global population in the shortest possible time. Africa and the developing world are a major focus for the 'vaccine' depopulation agenda and a mass vaccination sales-pitch is underway thanks to caring people like the Rockefellers and other Cult assets. The Rockefeller Foundation, which pre-empted the 'Covid pandemic' in a document published in 2010 that 'predicted' what happened a decade later, announced an initial \$34.95 million grant in February, 2021, 'to ensure more equitable access to Covid-19 testing and vaccines' among other things in Africa in collaboration with '24 organizations, businesses, and government agencies'. The pan-Africa initiative would focus on 10 countries: Burkina Faso, Ethiopia, Ghana, Kenya, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Zambia'. Rajiv Shah, President of the Rockefeller Foundation and former administrator of CIA-controlled USAID, said that if Africa was not mass-vaccinated (to change the DNA of its people) it was a 'threat to all of humanity' and not fair on Africans. When someone from the Rockefeller Foundation says they want to do something to help poor and deprived people and countries it is their 'heart' because 'vaccinating' the entire global population is what the 'Covid' hoax set out to achieve. Official 'decolonisation' of Africa by the Cult was merely a prelude to



financial colonisation on the road to a return to physical colonisation. The 'vaccine' is vital to that and the sudden and convenient death of the 'Covid' sceptic president of Tanzania can be seen in its true light. A lot of people in Africa are aware that this is another form of colonisation and exploitation and they need to stand their ground. The 'vaccine is working' scam A potential problem for the Cult was that the 'vaccine' is meant to change human DNA and body messaging and not to protect anyone from a 'virus' never shown to exist. The vaccine couldn't work because it was not designed to work and how could they make it appear to be working so that more people would have it? This was overcome by lowering the amplification rate of the PCR test to produce fewer 'cases' and therefore fewer 'deaths'. Some of us had been pointing out since March, 2020, that the amplification rate of the test not testing for the 'virus' had been made artificially high to generate positive tests which they could call 'cases' to justify lockdowns. The World Health Organization recommended an absurdly high 45 amplification cycles to ensure the high positives required by the Cult and then remained silent on the issue until January 20th, 2021 – Biden's Inauguration Day. This was when the 'vaccinations' were seriously underway and on that day the WHO recommended after discussions with America's CDC that laboratories lowered their testing amplification. Dr David Samadi, a certified urologist and health writer, said the WHO was encouraging all labs to reduce their cycle count for PCR tests. He said the current cycle was much too high and was 'resulting in any particle being declared a positive case'. Even one mainstream news report I saw said this meant the number of 'Covid' infections may have been 'dramatically inflated'. Oh, just a little bit. The CDC in America issued new guidance to laboratories in April, 2021, to use 28 cycles but only for 'vaccinated' people. The timing of the CDC/WHO interventions were cynically designed to make it appear the 'vaccines' were responsible for falling cases and deaths when the real reason can be seen in the following examples. New York's state lab, the Wadsworth Center, identified 872 positive tests in July, 2020, based on a threshold of 40 cycles. When the figure was lowered to 35 cycles 43 percent of the 872 were no longer 'positives'. At 30 cycles the figure was 63 percent. A Massachusetts lab found that between 85 to 90 percent

of people who tested positive in July with a cycle threshold of 40 would be negative at 30 cycles, Ashish Jha, MD, director of the Harvard Global Health Institute, said: 'I'm really shocked that it could be that high ... Boy, does it really change the way we need to be thinking about testing.' I'm shocked that I could see the obvious in the spring of 2020, with no medical background, and most medical professionals still haven't worked it out. No, that's not shocking – it's terrifying. Three weeks after the WHO directive to lower PCR cycles the London Daily Mail ran this headline: 'Why ARE Covid cases plummeting? New infections have fallen 45% in the US and 30% globally in the past 3 weeks but experts say vaccine is NOT the main driver because only 8% of Americans and 13% of people worldwide have received their first dose.' They acknowledged that the drop could not be attributed to the 'vaccine', but soon this morphed throughout the media into the 'vaccine' has caused cases and deaths to fall when it was the PCR threshold. In December, 2020, there was chaos at English Channel ports with truck drivers needing negative 'Covid' tests before they could board a ferry home for Christmas. The government wanted to remove the backlog as fast as possible and they brought in troops to do the 'testing'. Out of 1,600 drivers just 36 tested positive and the rest were given the all clear to cross the Channel. I guess the authorities thought that 36 was the least they could get away with without the unquestioning catching on. The amplification trick which most people believed in the absence of information in the mainstream applied more pressure on those refusing the 'vaccine' to succumb when it 'obviously worked'. The truth was the exact opposite with deaths in care homes soaring with the 'vaccine' and in Israel the term used was 'skyrocket'. A re-analysis of published data from the Israeli Health Ministry led by Dr Hervé Seligmann at the Medicine Emerging Infectious and Tropical Diseases at Aix-Marseille University found that Pfizer's 'Covid vaccine' killed 'about 40 times more [elderly] people than the disease itself would have killed' during a five-week vaccination period and 260 times more younger people than would have died from the 'virus' even according to the manipulated 'virus' figures. Dr Seligmann and his co-study author, Haim Yativ, declared after reviewing the Israeli 'vaccine' death data: 'This is a new Holocaust.' Then, in mid-April, 2021, after vast

numbers of people worldwide had been 'vaccinated', the story changed with clear coordination. The UK government began to prepare the ground for more future lockdowns when Nuremberg-destined Boris Johnson told yet another whopper. He said that cases had fallen because of lockdowns not 'vaccines'. Lockdowns are irrelevant when there is no 'virus' and the test and fraudulent death certificates are deciding the number of 'cases' and 'deaths'. Study after study has shown that lockdowns don't work and instead kill and psychologically destroy people. Meanwhile in the United States Anthony Fauci and Rochelle Walensky, the ultra-Zionist head of the CDC, peddled the same line. More lockdown was the answer and not the 'vaccine', a line repeated on cue by the moron that is Canadian Prime Minister Justin Trudeau. Why all the hysteria to get everyone 'vaccinated' if lockdowns and not 'vaccines' made the difference? None of it makes sense on the face of it. Oh, but it does. The Cult wants lockdowns and the 'vaccine' and if the 'vaccine' is allowed to be seen as the total answer lockdowns would no longer be justified when there are still livelihoods to destroy. 'Variants' and renewed upward manipulation of PCR amplification are planned to instigate never-ending lockdown and more 'vaccines'. You must have it – we're desperate Israel, where the Jewish and Arab population are ruled by the Sabbatian Cult, was the front-runner in imposing the DNA-manipulating 'vaccine' on its people to such an extent that Jewish refusers began to liken what was happening to the early years of Nazi Germany. This would seem to be a fantastic claim. Why would a government of Jewish people be acting like the Nazis did? If you realise that the Sabbatian Cult was behind the Nazis and that Sabbatians hate Jews the pieces start to fit and the question of why a 'Jewish' government would treat Jews with such callous disregard for their lives and freedom finds an answer. Those controlling the government of Israel aren't Jewish – they're Sabbatian. Israeli lawyer Tamir Turgal was one who made the Nazi comparison in comments to German lawyer Reiner Fuellmich who is leading a class action lawsuit against the psychopaths for crimes against humanity. Turgal described how the Israeli government was vaccinating children and pregnant women on the basis that there was no evidence that this was dangerous when they had no evidence that it wasn't dangerous either.

They just had no evidence. This was medical experimentation and Turgal said this breached the Nuremberg Code about medical experimentation and procedures requiring informed consent and choice. Think about that. A Nuremberg Code developed because of Nazi experimentation on Jews and others in concentration camps by people like the evil-beyond-belief Josef Mengele is being breached by the Israeli government; but when you know that it's a Sabbatian government along with its intelligence and military agencies like Mossad, Shin Bet and the Israeli Defense Forces, and that Sabbatians were the force behind the Nazis, the kaleidoscope comes into focus. What have we come to when Israeli Jews are suing their government for violating the Nuremberg Code by essentially making Israelis subject to a medical experiment using the controversial 'vaccines'? It's a shocker that this has to be done in the light of what happened in Nazi Germany. The Anshe Ha-Emet, or 'People of the Truth', made up of Israeli doctors, lawyers, campaigners and public, have launched a lawsuit with the International Criminal Court. It says: When the heads of the Ministry of Health as well as the prime minister presented the vaccine in Israel and began the vaccination of Israeli residents, the vaccinated were not advised, that, in practice, they are taking part in a medical experiment and that their consent is required for this under the Nuremberg Code. The irony is unbelievable, but easily explained in one word: Sabbatians. The foundation of Israeli 'Covid' apartheid is the 'green pass' or 'green passport' which allows Jews and Arabs who have had the DNA-manipulating 'vaccine' to go about their lives – to work, fly, travel in general, go to shopping malls, bars, restaurants, hotels, concerts, gyms, swimming pools, theatres and sports venues, while non-'vaccinated' are banned from all those places and activities. Israelis have likened the 'green pass' to the yellow stars that Jews in Nazi Germany were forced to wear – the same as the yellow stickers that a branch of UK supermarket chain Morrisons told exempt mask-wearers they had to display when shopping. How very sensitive. The Israeli system is blatant South African-style apartheid on the basis of compliance or non-compliance to fascism rather than colour of the skin. How appropriate that the Sabbatian Israeli government was so close to the pre-Mandela apartheid regime in Pretoria. The

Sabbatian-instigated 'vaccine passport' in Israel is planned for everywhere. Sabbatians struck a deal with Pfizer that allowed them to lead the way in the percentage of a national population infused with synthetic material and the result was catastrophic. Israeli freedom activist Shai Dannon told me how chairs were appearing on beaches that said 'vaccinated only'. Health Minister Yuli Edelstein said that anyone unwilling or unable to get the jabs that 'confer immunity' will be 'left behind'. The man's a liar. Not even the makers claim the 'vaccines' confer immunity. When you see those figures of 'vaccine' deaths these psychopaths were saying that you must take the chance the 'vaccine' will kill you or maim you while knowing it will change your DNA or lockdown for you will be permanent. That's fascism. The Israeli parliament passed a law to allow personal information of the non-vaccinated to be shared with local and national authorities for three months. This was claimed by its supporters to be a way to 'encourage' people to be vaccinated. Hadas Ziv from Physicians for Human Rights described this as a 'draconian law which crushed medical ethics and the patient rights'. But that's the idea, the Sabbatians would reply. Your papers, please Sabbatian Israel was leading what has been planned all along to be a global 'vaccine pass' called a 'green passport' without which you would remain in permanent lockdown restriction and unable to do anything. This is how badly – desperately – the Cult is to get everyone 'vaccinated'. The term and colour 'green' was not by chance and related to the psychology of fusing the perception of the green climate hoax with the 'Covid' hoax and how the 'solution' to both is the same Great Reset. Lying politicians, health officials and psychologists denied there were any plans for mandatory vaccinations or restrictions based on vaccinations, but they knew that was exactly what was meant to happen with governments of all countries reaching agreements to enforce a global system. 'Free' Denmark and 'free' Sweden unveiled digital vaccine certification. Cyprus, Czech Republic, Estonia, Greece, Hungary, Iceland, Italy, Poland, Portugal, Slovakia, and Spain have all committed to a vaccine passport system and the rest including the whole of the EU would follow. The satanic UK government will certainly go this way despite mendacious denials and at the time of writing it is trying to manipulate the public into having the 'vaccine' so they

could go abroad on a summer holiday. How would that work without something to prove you had the synthetic toxicity injected into you? Documents show that the EU's European Commission was moving towards 'vaccine certificates' in 2018 and 2019 before the 'Covid' hoax began. They knew what was coming. Abracadabra – Ursula von der Leyen, the German President of the Commission, announced in March, 2021, an EU 'Digital Green Certificate' – green again – to track the public's 'Covid status'. The passport sting is worldwide and the Far East followed the same pattern with South Korea ruling that only those with 'vaccination' passports – again the green pass – would be able to 'return to their daily lives'. Bill Gates has been preparing for this 'passport' with other Cult operatives for years and beyond the paper version is a Gates-funded 'digital tattoo' to identify who has been vaccinated and who hasn't. The 'tattoo' is reported to include a substance which is externally readable to confirm who has been vaccinated. This is a bio-luminous light-generating enzyme (think fireflies) called ... Luciferase. Yes, named after the Cult 'god' Lucifer the 'light bringer' of whom more to come. Gates said he funded the readable tattoo to ensure children in the developing world were vaccinated and no one was missed out. He cares so much about poor kids as we know. This was just the cover story to develop a vaccine tagging system for everyone on the planet. Gates has been funding the ID2020 'alliance' to do just that in league with other lovely people at Microsoft, GAVI, the Rockefeller Foundation, Accenture and IDEO.org. He said in interviews in March, 2020, before any 'vaccine' publicly existed, that the world must have a globalised digital certificate to track the 'virus' and who had been vaccinated. Gates knew from the start that the mRNA vaccines were coming and when they would come and that the plan was to tag the 'vaccinated' to marginalise the intelligent and stop was exposed for offering a \$10 million bribe to the Nigerian House of Representatives to invoke compulsory 'Covid' vaccination of all Nigerians. Sara Cunial, a member of the Italian Parliament, called Gates a 'vaccine criminal'. She urged the Italian President to hand him over to the International Criminal Court for crimes against humanity and condemned his plans to 'chip the human race' You know it's a long-planned agenda when war criminal and Cult gofer Tony Blair is on the case. With the

scale of arrogance only someone as dark as Blair can muster he said: 'Vaccination in the end is going to be your route to liberty.' Blair is a disgusting piece of work and he confirms that again. The media has given a lot of coverage to a bloke called Charlie Mullins, founder of London's biggest independent plumbing company, Pimlico Plumbers, who has said he won't employ anyone who has not been vaccinated or have them go to any home where people are not vaccinated. He said that if he had his way no one would be allowed to walk the streets if they have not been vaccinated. Gates was cheering at the time while I was alerting the white coats. The plan is that people will qualify for 'passports' for having the first two doses and then to keep it they will have to have all the follow ups and new ones for invented 'variants' until human genetics is transformed and many are dead who can't adjust to the changes. Hollywood celebrities – the usual propaganda stunt – are promoting something called the WELL Health-Safety Rating to verify that a building or space has 'taken the necessary steps to prioritize the health and safety of their staff, visitors and other stakeholders'. They included Lady Gaga, Jennifer Lopez, Michael B. Jordan, Robert DeNiro, Venus Williams, Wolfgang Puck, Deepak Chopra and 17th Surgeon General Richard Carmona. Yawn. WELL Health-Safety has big connections with China. Parent company Delos is headed by former Goldman Sachs partner Paul Scialla. This is another example – and we will see so many others – of using the excuse of 'health' to dictate the lives and activities of the population. I guess one confirmation of the 'safety' of buildings is that only 'vaccinated' people can go in, right? Electronic concentration camps I wrote decades ago about the plans to restrict travel and here we are for those who refuse to bow to tyranny. This can be achieved in one go with air travel if the aviation industry makes a blanket decree. The 'vaccine' and guaranteed income are designed to be part of a global version of China's social credit system which tracks behaviour 24/7 and awards or deletes 'credits' based on whether your behaviour is supported by the state or not. I mean your entire lifestyle – what you do, eat, say, everything. Once your credit score falls below a certain level consequences kick in. In China tens of millions have been denied travel by air and train because of this. All the locations and activities denied to refusers by the

'vaccine' anything for those that don't bow their head to government. It's beyond fascist and a new term is required to describe its extremes – I guess fascist technocracy will have to do. The way the Chinese system of technological – technocratic – control is sweeping the West can be seen in the Los Angeles school system and is planned to be expanded worldwide. Every child is required to have a 'Covid'- tracking app scanned daily before they can enter the classroom. The so-called Daily Pass tracking system is produced by Gates' MicrosoĎ which I'm sure will shock you rigid. The pass will be scanned using a barcode (one step from an inside-the-body barcode) and the information will include health checks, 'Covid' tests and vaccinations. Entry codes are for one specific building only and access will only be allowed if a student or teacher has a negative test with a test not testing for the 'virus', has no symptoms of anything alleged to be related to 'Covid' (symptoms from a range of other illness), and has a temperature under 100 degrees. No barcode, no entry, is planned to be the case for everywhere and not only schools. Kids are being psychologically prepared to accept this as 'normal' their whole life which is why what they can impose in schools is so important to the Cult and its gofers. Long-time American freedom campaigner John Whitehead of the Rutherford Institute was not exaggerating when he said: 'Databit by databit, we are building our own electronic concentration camps.' Canada under its Cult gofer prime minister Justin Trudeau has taken a major step towards the real thing with people interned against their will if they test positive with a test not testing for the 'virus' when they arrive at a Canadian airport. They are jailed in internment hotels oĎgen without food or water for long periods and with many doors failing to lock there have been sexual assaults. The interned are being charged sometimes \$2,000 for the privilege of being abused in this way. Trudeau is fully on board with the Cult and says the 'Covid pandemic' has provided an opportunity for a global 'reset' to permanently change Western civilisation. His number two, Deputy Prime Minister Chrystia Freeland, is a trustee of the World Economic Forum and a Rhodes Scholar. The Trudeau family have long been servants of the Cult. See The Biggest Secret and Cathy O'Brien's book Trance-Formation of America for the horrific background to Trudeau's father Pierre Trudeau another Canadian



prime minister. Hide your fascism behind the façade of a heart-on-the-sleeve liberal. It's a well-honed Cult technique. What can the 'vaccine' really do? We have a 'virus' never shown to exist and 'variants' of the 'virus' that have also never been shown to exist except, like the 'original', as computer-generated fictions. Even if you believe there's a 'virus' the 'case' to 'death' rate is in the region of 0.23 to 0.15 percent and those 'deaths' are concentrated among the very old around the same average age that people die anyway. In response to this lack of threat (in truth none) psychopaths and idiots, knowingly and unknowingly answering to Gates and the Cult, are seeking to 'vaccinate' every man, woman and child on Planet Earth. Clearly the 'vaccine' is not about 'Covid' – none of this ever has been. So what is it all about really? Why the desperation to infuse genetically-manipulating synthetic material into everyone through mRNA fraudulent excuses of 'variants' and other 'virus' inventions? Dr Sherri Tenpenny, an osteopathic medical doctor in the United States, has made herself an expert on vaccines and their effects as a vehement campaigner against their use. Tenpenny was board certified in emergency medicine, the director of a level two trauma centre for 12 years, and moved to Cleveland in 1996 to start an integrative medicine practice which has treated patients from all 50 states and some 17 other countries. Weaning people off pharmaceutical drugs is She became interested in the consequences of vaccines after attending a meeting at the National Vaccine Information Center in Washington DC in 2000 where she 'sat through four days of listening to medical doctors and scientists and lawyers and parents of vaccine injured kids' and asked: 'What's going on?' She had never been vaccinated and never got ill while her father was given a list of vaccines to be in the military and was 'sick his entire life'. The experience added to her questions and she began to examine vaccine documents from the Centers for Disease Control (CDC). After reading the first one, the 1998 version of The General Recommendations of Vaccination, she thought: 'This is it?' The document was poorly written and bad science and Tenpenny began 20 years of research into vaccines that continues to this day. She began her research into 'Covid vaccines' in March, 2020, and she describes them as 'deadly'. For many, as we have seen, they already have been. Tenpenny said that in the first 30 days of the 'vaccine'

rollout in the United States there had been more than 40,000 adverse events reported to the vaccine adverse event database. A document had been delivered to her the day before that was 172 pages long. 'We have over 40,000 adverse events; we have over 3,100 cases of [potentially deadly] anaphylactic shock; we have over 5,000 neurological reactions.' Effects ranged from headaches to numbness, dizziness and vertigo, to losing feeling in hands or feet and paraesthesia which is when limbs 'fall asleep' and people have the sensation of insects crawling underneath their skin. All this happened in the first 30 days and remember that only about ten percent (or far less) of adverse reactions and vaccine-related deaths are estimated to be officially reported. So can you think of one single product in any industry, any industry, for as long as products have been made on the planet that within 30 days we have 40,000 people complaining of side effects that not only is still on the market but ... we've got paid actors telling us how great they are for getting their vaccine. We're offering people \$500 if they will just get their vaccine and we've got nurses and doctors going; 'I got the vaccine, I got the vaccine'. Tenpenny said they were not going to be 'happy dancing folks' when they began to suffer Bell's palsy (facial paralysis), neuropathies, cardiac arrhythmias and autoimmune reactions that kill through a blood disorder. 'They're not going to be so happy, happy then, but we're never going to see pictures of those people' she said. Tenpenny described the 'vaccine' as 'a well-designed killing machine' as the initial consequences had been Tenpenny said it would be maybe 14 months before we began to see the 'full ravage' of what is going to happen to the 'Covid vaccinated' with full-out consequences taking anything between two years and 20 years to show. You can understand why when you consider that variations of the 'Covid vaccine' use mRNA (messenger RNA) to in theory activate the immune system to produce protective antibodies without using the actual 'virus'. How can they when it's a computer program and they've never isolated what they claim is the 'real thing'? Instead they use synthetic mRNA. They are inoculating synthetic material into the body which through a technique known as the Trojan horse is absorbed into cells to change the nature of DNA. Human DNA is changed by an infusion of messenger RNA and with each new 'vaccine' of this type it is changed even more.

Say so and you are banned by Cult Internet platforms. The contempt the contemptuous Mark Zuckerberg has for the truth and human health can be seen in an internal Facebook video leaked to the Project Veritas investigative team in which he said of the 'Covid vaccines': '... I share some caution on this because we just don't know the long term side-effects of basically modifying people's DNA and RNA.' At the same time this disgusting man's Facebook was censoring and banning anyone saying exactly the same. He must go before a Nuremberg trial for crimes against humanity when he knows that he is censoring legitimate concerns and denying the right of informed consent on behalf of the Cult that owns him. People have been killed and damaged by the very 'vaccination' technique he cast doubt on himself when they may not have had the 'vaccine' with access to information that he denied them. The plan is to have at least annual 'Covid vaccinations', add others to deal with invented 'variants', and change all other vaccines into the mRNA system. Pfizer executives told shareholders at a virtual Barclays Global Healthcare Conference in March, 2021, that the public may need a third dose of 'Covid vaccine', plus regular yearly boosters and the company planned to hike prices to milk the profits in a 'significant opportunity for our vaccine'. These are the professional liars, cheats and opportunists who are telling you their 'vaccine' is safe. Given this volume of mRNA planned to be infused into the human body and its ability to then replicate we will have a transformation of human genetics from biological to synthetic biological – exactly the long-time Cult plan for reasons we'll see – and many will die. Sherri Tenpenny said of this It's like having an on-button but no off-button and that whole mechanism ... they actually give it a name and they call it the Trojan horse mechanism, because it allows that [synthetic] virus and that piece of that [synthetic] virus to get inside of your cells, start to replicate and even get inserted into other parts of your DNA as a Trojan-horse. Ask the overwhelming majority of people who have the 'vaccine' what they know about the contents and what they do and they would reply: 'The government says it will stop me geġing the virus.' Governments give that false impression on purpose to increase take- up. You can read Sherri Tenpenny's detailed analysis of the health consequences in her blog at Vaxxter.com, but in summary these are

some of them. She highlights the statement by Bill Gates about how human beings can become their own 'vaccine manufacturing machine'. The man is insane. ['Vaccine'-generated] 'antibodies' carry synthetic messenger RNA into the cells and the damage starts, Tenpenny contends, and she says that lungs can be adversely affected through varying degrees of pus and bleeding which obviously affects breathing and would be dubbed 'Covid-19'. Even more sinister was the impact of 'antibodies' on macrophages, a white blood cell of the immune system. They consist of Type 1 and Type 2 which have very different functions. She said Type 1 are 'hyper- vigilant' white blood cells which 'gobble up' bacteria etc. However, circumstances be fatal. She says these affects are mitigated by Type 2 macrophages which kick in to calm down the system and stop it going rogue. They clear up dead tissue debris and reduce inflammation that the Type 1 'fire crews' have caused. Type 1 kills the infection and Type 2 heals the damage, she says. This is her punchline with regard to 'Covid vaccinations': She says that mRNA 'antibodies' block Type 2 macrophages by attaching to them and deactivating them. This meant that when the Type 1 response was triggered by infection there was nothing to stop that getting out of hand by calming everything down. There's an on-switch, but no off-switch, she says. What follows can be 'over and out, see you when I Tenpenny also highlights the potential for autoimmune disease – the body attacking itself – which has been associated with vaccines since they first appeared. Infusing a synthetic foreign substance into cells could cause the immune system to react in a panic believing that the body is being overwhelmed by an invader (it is) and the consequences can again be fatal. There is an autoimmune response known as a 'cytokine storm' which I have likened to a homeowner panicked by an intruder and picking up a gun to shoot randomly in all directions before turning the fire on himself. The immune system unleashes a storm of inflammatory response called cytokines to a threat and the body commits hara-kiri. The lesson is that you mess with the body's immune response at your peril and these 'vaccines' seriously – fundamentally – mess with immune response. Tenpenny refers to a consequence called anaphylactic shock which is a severe and highly dangerous allergic reaction when the immune system floods the body with chemicals. She

gives the example of having a bee sting which primes the immune system and makes it sensitive to those chemicals. When people are stung again maybe years later the immune response can be so powerful that it leads to anaphylactic shock. Tenpenny relates this 'shock' with regard to the 'Covid vaccine' to something called polyethylene glycol or PEG. Enormous numbers of people have become sensitive to this over decades of use in a whole range of products and processes including food, drink, skin creams and 'medicine'. Studies have claimed that some 72 percent of people have antibodies triggered by PEG compared with two percent in the 1960s and allergic hypersensitive reactions to this become a gathering cause for concern. Tenpenny points out that the 'mRNA vaccine' is coated in a 'bubble' of polyethylene glycol which has the potential to cause anaphylactic shock through immune sensitivity. Many reports have appeared of people reacting this way after having the 'Covid vaccine'. What do we think is going to happen as humanity has more and more of these 'vaccines'? Tenpenny said: 'All these pictures we have seen with people with these rashes ... these weepy rashes, big reactions on their arms and things like that - it's an acute allergic reaction most likely to the polyethylene glycol that you've been previously primed and Those who have not studied the conspiracy and its perpetrators at length might think that making the population sensitive to PEG and then putting it in these 'vaccines' is just a coincidence. It is not. It is instead testament to how carefully and coldly-planned current events have been and the scale of the conspiracy we are dealing with. Tenpenny further explains that the 'vaccine' mRNA procedure can breach the blood-brain barrier which protects the brain from toxins and other crap that will cause malfunction. In this case they could make two proteins corrupt brain function to cause Amyotrophic lateral sclerosis (ALS) , a progressive nervous system disease leading to loss of muscle control, and frontal lobe degeneration - Alzheimer's and dementia. Immunologist J. Bart Classon published a paper connecting mRNA 'vaccines' to prion disease which can lead to Alzheimer's and other forms of neurodegenerative disease while others have pointed out the potential to affect the placenta in ways that make women infertile. This will become highly significant in the next chapter when I will discuss other aspects of this

non-vaccine that relate to its nanotechnology and transmission from the injected to the uninjected. Qualified in idiocy Tenpenny describes how research has confirmed that these 'vaccine'- generated antibodies can interact with a range of other tissues in the body and aâJack many other organs including the lungs. 'This means that if you have a hundred people standing in front of you that all got this shot they could have a hundred different symptoms.' Anyone really think that Cult gofers like the Queen, Tony Blair, Christopher Whiĵy, Anthony Fauci, and all the other psychopaths have really had this 'vaccine' in the pictures we've seen? Not a bloody chance. Why don't doctors all tell us about all these dangers and consequences of the 'Covid vaccine'? Why instead do they encourage and pressure patients to have the shot? Don't let's think for a moment that doctors and medical staff can't be stupid, lazy, and psychopathic and that's without the financial incentives to give the jab. Tenpenny again: Some people are going to die from the vaccine directly but a large number of people are going to start to get horribly sick and get all kinds of autoimmune diseases 42 days to maybe a year out. What are they going to do, these stupid doctors who say; 'Good for you for getting that vaccine.' What are they going to say; 'Oh, it must be a mutant, we need to give an extra dose of that vaccine.' Because now the vaccine, instead of one dose or two doses we need three or four because the stupid physicians aren't taking the time to learn anything about it. If I can learn this sitting in my living room reading a 19 page paper and several others so can they. There's nothing special about me, I just take the time to do it. Remember how Sara Kayat, the NHS and TV doctor, said that the 'Covid vaccine' would '100 percent prevent hospitalisation and death'. Doctors can be idiots like every other profession and they should not be worshipped as infallible. They are not and far from it. Behind many medical and scientific 'experts' lies an uninformed prat trying to hide themselves from you although in the 'Covid' era many have failed to do so as with UK narrative-repeating 'TV doctor' Hilary Jones. Pushing back against the minority of proper doctors and scientists speaking out against the 'vaccine' has been the entire edifice of the Cult global state in the form of governments, medical systems, corporations, mainstream media, Silicon Valley, and an army of compliant doctors, medical

staff and scientists willing to say anything for money and to enhance their careers by promoting the party line. If you do that you are an 'expert' and if you won't you are an 'anti-vaxxer' and 'Covidiot'. The pressure to be 'vaccinated' is incessant. We have even had reports claiming that the 'vaccine' can help cure cancer and Alzheimer's and make the lame walk. I am waiting for the announcement that it can bring you coffee in the morning and cook your tea. Just as the symptoms of 'Covid' seem to increase by the week so have the miracles of the 'vaccine'. American supermarket giant Kroger Co. offered nearly 500,000 employees in 35 states a \$100 bonus for having the 'vaccine' while donut chain Krispy Kreme promised 'vaccinated' customers a free glazed donut every day for the rest of 2021. Have your DNA changed and you will get a doughnut although we might not have to give you them for long. Such offers and incentives confirm the desperation. Perhaps the worse vaccine-stunt of them all was UK 'Health' Secretary MaĴ-the-prat Hancock on live TV aĴer watching a clip of someone being 'vaccinated' when the roll-out began. Hancock faked tears so badly it was embarrassing. Brain-of-Britain Piers Morgan, the lockdown-supporting, 'vaccine' supporting, 'vaccine' passport- supporting, TV host played along with Hancock – 'You're quite emotional about that' he said in response to acting so atrocious it would have been called out at a school nativity which will presumably today include Mary and Jesus in masks, wise men keeping their camels six feet apart, and shepherds under tent arrest. System-serving Morgan tweeted this: 'Love the idea of covid vaccine passports for everywhere: flights, restaurants, clubs, football, gyms, shops etc. It's time covid-denying, anti-vaxxer loonies had their bullsh\*t bluff called & bar themselves from going anywhere that responsible citizens go.' If only I could aspire to his genius. To think that Morgan, who specialises in shouting over anyone he disagrees with, was lauded as a free speech hero when he lost his job aĴer storming off the set of his live show like a child throwing his dolly out of the pram. If he is a free speech hero we are in real trouble. I have no idea what 'bullsh\*t' means, by the way, the \* throws me The Cult is desperate to infuse its synthetic DNA-changing concoction into everyone and has been using every lie, trick and intimidation to do so. The question of 'Why?' we shall now address. I believe

that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted – Alan Turing (1912-1954), the ‘Father of artificial intelligence’ have been exposing for decades the plan to transform the human body from a biological to a synthetic-biological state. The new human that I will call Human 2.0 is planned to be connected to artificial intelligence and a global AI ‘Smart Grid’ that would operate as one global system in which AI would control everything from your fridge to your heating system to your car to your mind. Humans would no longer be ‘human’, but post-human and sub-human, with their thinking and emotional processes replaced by AI. What I said sounded crazy and beyond science fiction and I could understand that. To any balanced, rational, mind it is crazy. Today, however, that world is becoming reality and it puts the ‘Covid vaccine’ into its true context. Ray Kurzweil is the ultra-Zionist ‘computer scientist, inventor and futurist’ and co-founder of the Singularity University. Singularity refers to the merging of humans with machines or ‘transhumanism’. Kurzweil has said humanity would be connected to the cyber ‘cloud’ in the period of the ever-recurring year of 2030: Our thinking ... will be a hybrid of biological and non-biological thinking ... humans will be able to extend their limitations and ‘think in the cloud’ ... We’re going to put gateways to the cloud in our brains ... We’re going to gradually merge and enhance ourselves ... In my view, that’s the nature of being human – we transcend our limitations. As the technology becomes vastly superior to what we are then the small proportion that is still human gets smaller and smaller and smaller until it’s just utterly negligible. They are trying to sell this end-of-humanity-as-we-know-it as the next stage of ‘evolution’ when we become super-human and ‘like the gods’. They are lying to you. Shocked, eh? The population, and again especially the young, have been manipulated into addiction to technologies designed to enslave them for life. First they induced an addiction to smartphones (holdables); next they moved to technology on the body (wearables); and then began the invasion of the body (implantables). I warned way back about the plan for microchipped people and we are now entering that era. We should not be diverted into thinking that this



refers only to chips we can see. Most important are the nanochips known as smart dust, neural dust and nanobots which are far too small to be seen by the human eye. Nanotechnology is everywhere, increasingly in food products, and released into the atmosphere by the geoengineering of the skies funded by Bill Gates to 'shut out the Sun' and 'save the planet from global warming'. Gates has been funding a project to spray millions of tonnes of chalk (calcium carbonate) into the stratosphere over Sweden to 'dim the Sun' and cool the Earth. Scientists warned the move could be disastrous for weather systems in ways no one can predict and opposition led to the Swedish space agency announcing that the 'experiment' would not be happening as planned in the summer of 2021; but it shows where the Cult is going with dimming the impact of the Sun and there's an associated plan to change the planet's atmosphere. Who gives psychopath Gates the right to dictate to the entire human race and dismantle planetary systems? The world will not be safe while this man is at large. The global warming hoax has made the Sun, like the gas of life, something to fear when both are essential to good health and human survival (more inversion). The body transforms sunlight into vital vitamin D through a process involving ... cholesterol. This is the cholesterol we are also told to fear. We are urged to take Big Pharma statin drugs to reduce cholesterol and it's all systematic. Reducing cholesterol means reducing vitamin D uptake with all the multiple health problems that will cause. At least if you take statins long term it saves the government from having to pay you a pension. The delivery system to block sunlight is widely referred to as chemtrails although these have a much deeper agenda, too. They appear at first to be contrails or condensation trails streaming from aircraft into cold air at high altitudes. Contrails disperse very quickly while chemtrails do not and spread out across the sky before eventually their content falls to earth. Many times I have watched aircraft cross- cross a clear blue sky releasing chemtrails until it looks like a cloudy day. Chemtrails contain many things harmful to humans and the natural world including toxic heavy metals, aluminium (see Alzheimer's) and nanotechnology. Ray Kurzweil reveals the reason without actually saying so: 'Nanobots will infuse all the matter around us with information. Rocks, trees, everything will

become these intelligent creatures.' How do you deliver that? From the sky. Self-replicating nanobots would connect everything to the Smart Grid. The phenomenon of Morgellons disease began in the chemtrail era and the correlation has led to it being dubbed the 'chemtrail disease'. Self-replicating fibres appear in the body that can be pulled out through the skin. Morgellons fibres continue to grow outside the body and have a form of artificial intelligence. I cover this at greater length in Phantom Self. 'Vaccine' operating system 'Covid vaccines' with their self-replicating synthetic material are also designed to make the connection between humanity and Kurzweil's 'cloud'. American doctor and dedicated campaigner for truth, Carrie Madej, an Internal Medicine Specialist in Georgia with more than 20 years medical experience, has highlighted the nanotechnology aspect of the fake 'vaccines'. She explains how one of the components in at least the Moderna and Pfizer synthetic potions are 'lipid nanoparticles' which are 'like little tiny computer bits' – a 'sci-fi substance' known as nanobots and hydrogel which can be 'triggered at any moment to deliver its payload' and act as 'biosensors'. The synthetic substance had 'the ability to accumulate data from your body like your breathing, your respiration, thoughts and emotions, all kind of things' and each syringe could carry a million nanobots: This substance because it's like little bits of computers in your body, crazy, but it's true, it can do that, [and] obviously has the ability to act through Wi-Fi. It can receive and transmit energy, messages, frequencies or impulses. That issue has never been addressed by these companies. What does that do to the human? Just imagine getting this substance in you and it can react to things all around you, the 5G, your smart device, your phones, what is happening with that? What if something is triggering it, too, like an impulse, a frequency? We have something completely foreign in the human Madej said her research revealed that electromagnetic (EMF) frequencies emitted by phones and other devices had increased dramatically in the same period of the 'vaccine' rollout and she was seeing more people with radiation problems as 5G and other electromagnetic technology was expanded and introduced to schools and hospitals. She said she was 'floored with the EMF coming off the devices she checked. All this makes total sense and syncs with my own work of decades

when you think that Moderna refers in documents to its mRNA ‘vaccine’ as an ‘operating system’: Recognizing the broad potential of mRNA science, we set out to create an mRNA technology platform that functions very much like an operating system on a computer. It is designed so that it can plug and play interchangeably with different programs. In our case, the ‘program’ or ‘app’ is our mRNA drug – the unique mRNA sequence that codes for a protein ... .. Our MRNA Medicines – ‘The ‘Software Of Life’: When we have a concept for a new mRNA medicine and begin research, fundamental components are already in place. Generally, the only thing that changes from one potential mRNA medicine to another is the coding region – the actual genetic code that instructs ribosomes to make protein. Utilizing these instruction sets gives our investigational mRNA medicines a software-like quality. We also have the ability to combine different mRNA sequences encoding for different proteins in a single mRNA investigational medicine. Who needs a real ‘virus’ when you can create a computer version to justify infusing your operating system into the entire human race on the road to making living, breathing people into cyborgs? What is missed with the ‘vaccines’ is the digital connection between synthetic material and the body that I highlighted earlier with the study that hacked a computer with human DNA. On one level the body is digital, based on mathematical codes, and I’ll have more about that in the next chapter. Those who ridiculously claim that mRNA ‘vaccines’ are not designed to change human genetics should explain the words of Dr Tal Zaks, chief medical officer at Moderna, in a 2017 TED talk. He said that over the last 30 years ‘we’ve been living this phenomenal digital scientific revolution, and I’m here today to tell you, that we are actually hacking the software of life, and that it’s changing the way we think about prevention and treatment of In every cell there’s this thing called messenger RNA, or mRNA for short, that transmits the critical information from the DNA in our genes to the protein, which is really the stuff we’re all made out of. This is the critical information that determines what the cell will do. So we think about it as an operating system. So if you could change that, if you could introduce a line of code, or change a line of code, it turns out, that has profound implications for everything, from the flu to cancer. Zaks should more accurately have said that

this has profound implications for the human genetic code and the nature of DNA. Communications within the body go both ways and not only one. But, hey, no, the 'Covid vaccine' will not affect your genetics. Cult fact-checkers say so even though the man who helped to develop the mRNA technique says that it does. Zaks said in 2017: If you think about what it is we're trying to do. We've taken information and our understanding of that information and how that information is transmitted in a cell, and we've taken our understanding of medicine and how to make drugs, and we're fusing the two. We think of it as information therapy. I have been writing for decades that the body is an information field communicating with itself and the wider world. This is why radiation which is information can change the information field of body and mind through phenomena like 5G and change their nature and function. 'Information therapy' means to change the body's information field and change the way it operates. DNA is a receiver- transmitter of information and can be mutated by information like mRNA synthetic messaging. Technology to do this has been ready and waiting in the underground bases and other secret projects to be rolled out when the 'Covid' hoax was played. 'Trials' of such short and irrelevant duration were only for public consumption. When they say the 'vaccine' is 'experimental' that is not true. It may appear to be 'experimental' to those who don't know what's going on, but the trials have already been done to ensure the Cult gets the result it desires. Zaks said that it took decades to sequence the human genome, completed in 2003, but now they could do it in a week. By 'they' he means scientists operating in the public domain. In the secret projects they were sequencing the genome in a week long before even 2003. Deluge of mRNA Highly significantly the Moderna document says the guiding premise is that if using mRNA as a medicine works for one disease then it should work for many diseases. They were leveraging the flexibility afforded by their platform and the fundamental role mRNA plays in protein synthesis to pursue mRNA medicines for a broad spectrum of diseases. Moderna is confirming what I was saying through 2020 that multiple 'vaccines' were planned for 'Covid' (and later invented 'variants') and that previous vaccines would be converted to the mRNA system to infuse the body with massive

amounts of genetically-manipulating synthetic material to secure a transformation to a synthetic-biological state. The 'vaccines' are designed to kill stunning numbers as part of the long-exposed Cult depopulation agenda and transform the rest. Given this is the goal you can appreciate why there is such hysterical demand for every human to be 'vaccinated' for an alleged 'disease' that has an estimated 'infection' to 'death' ratio of 0.23-0.15 percent. As I write children are being given the 'vaccine' in trials (their parents are a disgrace) and ever-younger people are being offered the vaccine for a 'virus' that even if you believe it exists has virtually zero chance of harming them. Horrific effects of the 'trials' on a 12-year-old girl were revealed by a family member to be serious brain and gastric problems that included a bowel obstruction and the inability to swallow liquids or solids. She was unable to eat or drink without throwing up, had extreme pain in her back, neck and abdomen, and was paralysed from the waist down which stopped her urinating unaided. When the girl was first taken to hospital doctors said it was all in her mind. She was signed up for the 'trial' by her parents for whom no words suffice. None of this 'Covid vaccine' insanity makes any sense unless you see what the 'vaccine' really is – a body- changer. Synthetic biology or 'SynBio' is a fast-emerging and expanding scientific discipline which includes everything from genetic and molecular engineering to electrical and computer engineering. Synthetic biology is defined in these ways: A multidisciplinary area of research that seeks to create new biological parts, devices, and systems, or to redesign systems that are already found in nature. The use of a mixture of physical engineering and genetic engineering to create new (and therefore synthetic) life forms. An emerging field of research that aims to combine the knowledge and methods of biology, engineering and related disciplines in the design of chemically-synthesized DNA to create organisms with novel or enhanced characteristics and traits (synthetic organisms including humans). We now have synthetic blood, skin, organs and limbs being developed along with synthetic body parts produced by 3D printers. These are all elements of the synthetic human programme and this comment by Kurzweil's co-founder of the Singularity University, Peter Diamandis, can be seen in a whole new light with the 'Covid' hoax and the

sanctions against those that refuse the 'vaccine': Anybody who is going to be resisting the progress forward [to transhumanism] is going to be resisting evolution and, fundamentally, they will die out. It's not a matter of whether it's good or bad. It's going to happen. 'Resisting evolution'? What absolute bollocks. The arrogance of these people is without limit. His 'it's going to happen' mantra is another way of saying 'resistance is futile' to break the spirit of those pushing back and we must not fall for it. Geïjing this genetically- transforming 'vaccine' into everyone is crucial to the Cult plan for total control and the desperation to achieve that is clear for anyone to see. Vaccine passports are a major factor in this and they, too, are a form of resistance is futile. It's NOT. The paper funded by the Rockefeller Foundation for the 2013 'health conference' in China We will interact more with artificial intelligence. The use of robotics, bio-engineering to augment human functioning is already well underway and will advance. Re-engineering of humans into potentially separate and unequal forms through genetic engineering or mixed human-robots raises debates on ethics and equality. A new demography is projected to emerge after 2030 [that year again] of technologies (robotics, genetic engineering, nanotechnology) producing robots, engineered organisms, 'nanobots' and artificial intelligence (AI) that can self-replicate. Debates will grow on the implications of an impending reality of human designed life. What is happening today is so long planned. The world army enforcing the will of the world government is intended to be a robot army, not a human one. Today's military and its technologically 'enhanced' troops, pilotless planes and driverless vehicles are just stepping stones to that end. Human soldiers are used as Cult fodder and its time they woke up to that and worked for the freedom of the population instead of their own destruction and their family's destruction – the same with the police. Join us and let's sort this out. The phenomenon of enforce my own destruction is widespread in the 'Covid' era with Woker 'luvvies' in the acting and entertainment industries supporting 'Covid' rules which have destroyed their profession and the same with those among the public who put signs on the doors of their businesses 'closed due to Covid – stay safe' when many will never reopen. It's a form of masochism and most Transgender = transhumanism When

something explodes out of nowhere and is suddenly everywhere it is always the Cult agenda and so it is with the tidal wave of claims and demands that have infiltrated every aspect of society under the heading of 'transgenderism'. The term 'trans' is so 'in' and this is the dictionary definition: A prefix meaning 'across', 'through', occurring ... in loanwords from Latin, used in particular for denoting movement or conveyance from place to place (transfer; transmit; transplant) or complete change (transform; transmute), or to form adjectives meaning 'crossing', 'on the other side of', or 'going beyond' the place named (transmontane; transnational; trans- Transgender means to go beyond gender and transhuman means to go beyond human. Both are aspects of the Cult plan to transform the human body to a synthetic state with no gender. Human 2.0 is not designed to procreate and would be produced technologically with no need for parents. The new human would mean the end of parents and so men, and increasingly women, are being targeted for the deletion of their rights and status. Parental rights are disappearing at an ever-quickenning speed for the same reason. The new human would have no need for men or women when there is no procreation and no gender. Perhaps the transgender movement that appears to be in a permanent state of frenzy might now contemplate on how it is being used. This was never about transgender rights which are only the interim excuse for confusing gender, particularly in the young, on the road to fusing gender. Transgender activism is not an end; it is a means to an end. We see again the technique of creative destruction in which you destroy the status quo to 'build back bejêr' in the form that you want. The gender status quo had to be destroyed by persuading the Cult-created Woke mentality to believe that you can have 100 genders or more. A programme for 9 to 12 year olds produced by the Cult-owned BBC promoted the 100 genders narrative. The very idea may be the most monumental nonsense, but it is not what is true that counts, only what you can make people believe is true. Once the gender of  $2 + 2 = 4$  has been dismantled through indoctrination, intimidation and  $2 + 2 = 5$  then the new no-gender normal can take its place with Human 2.0. Aldous Huxley revealed the plan in his prophetic Brave New World in Natural reproduction has been done away with and children are created, decanted',

and raised in 'hatcheries and conditioning centres'. From birth, people are genetically designed to fit into one of five castes, which are further split into 'Plus' and 'Minus' members and designed to fulfil predetermined positions within the social and economic strata of the World State. How could Huxley know this in 1932? For the same reason George Orwell knew about the Big Brother state in 1948, Cult insiders I have quoted knew about it in 1969, and I have known about it since the early 1990s. If you are connected to the Cult or you work your balls off to uncover the plan you can predict the future. The process is simple. If there is a plan for the world and nothing intervenes to stop it then it will happen. Thus if you communicate the plan ahead of time you are perceived to have predicted the future, but you haven't. You have revealed the plan which without intervention will become the human future. The whole reason I have done what I have is to alert enough people to inspire an intervention and maybe at last that time has come with the Cult and its intentions now so obvious to anyone with a brain in working order. The future is here Technological wombs that Huxley described to replace parent procreation are already being developed and they are only the projects we know about in the public arena. Israeli scientists told The Times of Israel in March, 2021, that they have grown 250-cell embryos into mouse fetuses with fully formed organs using artificial wombs in a development they say could pave the way for gestating humans outside the womb. Professor Jacob Hanna of the Weizmann Institute of Science said: We took mouse embryos from the mother at day five of development, when they are just of 250 cells, and had them in the incubator from day five until day 11, by which point they had grown all their organs. By day 11 they make their own blood and have a beating heart, a fully developed brain. Anybody would look at them and say, 'this is clearly a mouse fetus with all the characteristics of a mouse.' It's gone from being a ball of cells to being an advanced fetus. A special liquid is used to nourish embryo cells in a laboratory dish and they float on the liquid to duplicate the first stage of embryonic development. The incubator creates all the right conditions for its development, Hanna said. The liquid gives the embryo 'all the nutrients, hormones and sugars they need' along with a custom-made electronic incubator which



controls gas concentration, pressure and temperature. The cutting-edge in the underground bases and other secret locations will be light years ahead of that, however, and this was reported by the London Guardian in 2017: We are approaching a biotechnological breakthrough. Ectogenesis, the invention of a complete external womb, could completely change the nature of human reproduction. In April this year, researchers at the Children's Hospital of Philadelphia announced their development of an artificial womb. The article was headed 'Artificial wombs could soon be a reality. What will this mean for women?' What would it mean for children is an even bigger question. No mother to bond with only a machine in preparation for a life of soulless interaction and control in a world governed by machines (see the Matrix movies). Now observe the calculated manipulations of the 'Covid' hoax as human interaction and warmth has been curtailed by distancing, isolation and fear with people communicating via machines on a scale never seen before. These are all dots in the same picture as are all the personal assistants, gadgets and children's toys through which kids and adults communicate with AI as if it is human. The AI 'voice' on Sat-Nav should be included. All these things are psychological preparation for the Cult endgame. Before you can make a physical connection with AI you have to make a psychological connection and that is what people are being conditioned to do with this ever gathering human-AI interaction. Movies and TV programmes depicting the transhuman, robot dystopia relate to a phenomenon known as 'pre-emptive programming' in which the world that is planned is portrayed everywhere in movies, TV and advertising. This is conditioning the conscious and subconscious mind to become familiar with the planned reality to dilute resistance when it happens for real. What would have been a shock such is the change is made less so. We have young children put on the road to transgender transition surgery with puberty blocking drugs at an age when they could never be able to make those life-changing decisions. Rachel Levine, a professor of paediatrics and psychiatry who believes in treating children this way, became America's highest-ranked openly-transgender official when she was confirmed as US Assistant Secretary at the Department of Health and Human Services after being nominated by Joe Biden (the Cult).

Activists and governments press for laws to deny parents a say in their children's transition process so the kids can be isolated and manipulated into agreeing to irreversible medical procedures. A Canadian father Robert Hoogland was denied bail by the Vancouver Supreme Court in 2021 and remained in jail for breaching a court order that he stay silent over his young teenage daughter, a minor, who was being offered life-changing hormone therapy without parental consent. At the age of 12 the girl's 'school counsellor' said she may be transgender, referred her to a doctor and told the school to treat her like a boy. This is another example of state-serving schools imposing ever more control over children's lives while parents have ever less. Contemptible and extreme child abuse is happening all over the world as the Cult gender-fusion operation goes into warp-speed. Why the war on men – and now women? The question about what artificial wombs mean for women should rightly be asked. The answer can be seen in the deletion of women's rights involving sport, changing rooms, toilets and status in favour of people in male bodies claiming to identify as women. I can identify as a mountain climber, but it doesn't mean I can climb a mountain any more than a biological man can be a biological woman. To believe so is a triumph of belief over factual reality which is the very perceptual basis of everything Woke. Women's sport is being destroyed by allowing those with male bodies who say they identify as female to 'compete' with girls and women. Male body 'women' dominate 'women's' competition with their greater muscle mass, bone density, strength and speed. With that disadvantage sport for women loses all meaning. To put this in perspective nearly 300 American high school boys can run faster than the quickest woman sprinter in the world. Women are seeing their previously protected spaces invaded by male bodies simply because they claim to identify as women. That's all they need to do to access all women's spaces and activities under the Biden 'Equality Act' that destroys equality for women with the usual Orwellian Woke inversion. Male sex offenders have already commiŕed rapes in women's prisons aŕer claiming to identify as women to get them transferred. Does this not maŕer to the Woke 'equality' hypocrites? Not in the least. What maŕers to Cult manipulators and funders behind transgender activists is to

advance gender fusion on the way to the no-gender 'human'. When you are seeking to impose transparent nonsense like this, or the 'Covid' hoax, the only way the nonsense can prevail is through censorship and intimidation of dissenters, deletion of factual information, and programming of the unquestioning, bewildered and naive. You don't have to scan the world for long to see that all these things are happening. Many women's rights organisations have realised that rights and status which took such a long time to secure are being eroded and that it is systematic. Kara Dansky of the global Women's Human Rights Campaign said that Biden's transgender executive order immediately he took office, subsequent orders, and Equality Act legislation that followed 'seek to erase women and girls in the law as a category'. Exactly. I said during the long ago-started war on men (in which many women play a crucial part) that this was going to turn into a war on them. The Cult is phasing out both male and female genders. To get away with that they are brought into conflict so they are busy fighting each other while the Cult completes the job with no unity of response. Unity, people, unity. We need unity everywhere. Transgender is the only show in town as the big step towards the no-gender human. It's not about rights for transgender people and never has been. Woke political correctness is deleting words relating to genders to the same end. Wokers believe this is to be 'inclusive' when the opposite is true. They are deleting words describing gender because gender itself is being deleted by Human 2.0. Terms like 'man', 'woman', 'mother' and 'father' are being deleted in the universities and other institutions to be replaced by the no-gender, not trans-gender, 'individuals' and 'guardians'. Women's rights campaigner Maria Keffler of Partners for Ethical Care said: 'Children are being taught from kindergarten upward that some boys have a vagina, some girls have a penis, and that kids can be any gender they want to be.' Do we really believe that suddenly countries all over the world at the same time had the idea of having drag queens go into schools or read transgender stories to very young children in the local library? It's coldly-calculated confusion of gender on the way to the fusion of gender. Suzanne Vierling, a psychologist from Southern California, made another important Yesterday's slave woman who endured gynecological medical experiments is today's girl- child

being butchered in a booming gender-transitioning sector. Ovaries removed, pushing her into menopause and osteoporosis, uncharted territory, and parents' rights and authority. The erosion of parental rights is a common theme in line with the Cult plans to erase the very concept of parents and 'ovaries removed, pushing her into menopause' means what? Those born female lose the ability to have children – another way to discontinue humanity as we know it. Eliminating Human 1.0 (before our very eyes) To pave the way for Human 2.0 you must phase out Human 1.0. This is happening through plummeting sperm counts and making women infertile through an onslaught of chemicals, radiation (including smartphones in pockets of men) and mRNA 'vaccines'. Common agriculture pesticides are also having a devastating impact on human fertility. I have been tracking collapsing sperm counts in the books for a long time and in 2021 came a book by fertility scientist and reproductive epidemiologist Shanna Swan, *Count Down: How Our Modern World Is Threatening Sperm Counts, Altering Male and Female Reproductive Development and Imperiling the Future of the Human Race*. She reports how the global fertility rate dropped by half between 1960 and 2016 with America's birth rate 16 percent below where it needs to be to sustain the population. Women are experiencing declining egg quality, more miscarriages, and more couples suffer from infertility. Other findings were an increase in erectile dysfunction, infant boys developing more genital abnormalities, male problems with conception, and plunging levels of the male hormone testosterone which would explain why so many men have lost their backbone and masculinity. This has been very evident during the 'Covid' hoax when women have been prominent among the Pushbackers and big strapping blokes have bowed their heads, covered their faces with a nappy and quietly submitted. Mind control expert Cathy O'Brien also points to how global education introduced the concept of 'we're all winners' in sport and classrooms: 'Competition was defused, and it in turn defused a sense of fighting back.' This is another version of the 'equity' doctrine in which you drive down rather than raise up. What a contrast in Cult-controlled China with its global ambitions where the government published plans in January, 2021, to 'cultivate masculinity' in boys from kindergarten through to high school in

the face of a 'masculinity crisis'. A government adviser said boys would be soon become 'delicate, timid and effeminate' unless action was taken. Don't expect any similar policy in the targeted West. A 2006 study showed that a 65-year-old man in 2002 had testosterone levels 15 percent lower than a 65-year-old man in 1987 while a 2020 study found a similar story with young adults and adolescents. Men are getting prescriptions for testosterone replacement therapy which causes an even greater drop in sperm count with up to 99 percent seeing sperm counts drop to zero during the treatment. More sperm is defective and malfunctioning with some having two heads or not pursuing an egg. A class of synthetic chemicals known as phthalates are being blamed for the decline. These are found everywhere in plastics, shampoos, cosmetics, furniture, flame retardants, personal care products, pesticides, canned foods and even receipts. Why till receipts? Everyone touches them. Let no one delude themselves that all this is not systematic to advance the long-time agenda for human body transformation. Phthalates mimic hormones and disrupt the hormone balance causing testosterone to fall and genital birth defects in male infants. Animals and fish have been affected in the same way due to phthalates and other toxins in rivers. When fish turn gay or change sex through chemicals in rivers and streams it is a pointer to why there has been such an increase in gay people and the sexually confused. It doesn't matter to me what sexuality people choose to be, but if it's being affected by chemical pollution and consumption then we need to know. Does anyone really think that this is not connected to the transgender agenda, the war on men and the condemnation of male 'toxic masculinity'? You watch this being followed by 'toxic femininity'. It's already happening. When breastfeeding becomes 'chest-feeding', pregnant women become pregnant people along with all the other Woke claptrap you know that the world is going insane and there's a Cult scam in progress. Transgender activists are promoting the Cult agenda while Cult billionaires support and fund the insanity as they laugh themselves to sleep at the sheer stupidity for which humans must be infamous in galaxies far, far away. 'Covid vaccines' and female infertility We can now see why the 'vaccine' has been connected to potential infertility in women. Dr Michael Yeadon,

former Vice President and Chief Scientific Advisor at Pfizer, and Dr Wolfgang Wodarg in Germany, filed a petition with the European Medicines Agency in December, 2020, urging them to stop trials for the Pfizer/BioNTech shot and all other mRNA trials until further studies had been done. They were particularly concerned about possible effects on fertility with 'vaccine'-produced antibodies attacking the protein Syncytin-1 which is responsible for developing the placenta. The result would be infertility 'of indefinite duration' in women who have the 'vaccine' with the placenta failing to form. Section 10.4.2 of the Pfizer/BioNTech trial protocol says that pregnant women or those who might become so should not have mRNA shots. Section 10.4 warns men taking mRNA shots to 'be abstinent from heterosexual intercourse' and not to donate sperm. The UK government said that it did not know if the mRNA procedure had an effect on fertility. Did not know? These people have to go to jail. UK government advice did not recommend at the start that pregnant women had the shot and said they should avoid pregnancy for at least two months after 'vaccination'. The 'advice' was later updated to pregnant women should only have the 'vaccine' if the benefits outweighed the risks to mother and foetus. What the hell is that supposed to mean? Then 'spontaneous abortions' began to appear and rapidly increase on the adverse reaction reporting schemes which include only a fraction of adverse reactions. Thousands and ever-growing numbers of 'vaccinated' women are describing changes to their menstrual cycle with heavier blood flow, irregular periods and menstruating again after going through the menopause – all links to reproduction effects. Women are passing blood clots and the lining of their uterus while men report erectile dysfunction and blood effects. Most significantly of all unvaccinated women began to report similar menstrual changes after interaction with 'vaccinated' people and men and children were also affected with bleeding noses, blood clots and other conditions. 'Shedding' is when vaccinated people can emit the content of a vaccine to affect the unvaccinated, but this is different. 'Vaccinated' people were not shedding a 'live virus' allegedly in 'vaccines' as before because the fake 'Covid vaccines' involve synthetic material and other toxicity. Doctors exposing what is happening prefer the term 'transmission' to shedding.

Somehow those that have had the shots are transmiŕing effects to those that haven't. Dr Carrie Madej said the nano-content of the 'vaccines' can 'act like an antenna' to others around them which fits perfectly with my own conclusions. This 'vaccine' transmission phenomenon was becoming known as the book went into production and I deal with this further in the Postscript. Vaccine effects on sterility are well known. The World Health Organization was accused in 2014 of sterilising millions of women in Kenya with the evidence confirmed by the content of the vaccines involved. The same WHO behind the 'Covid' hoax admiŕed its involvement for more than ten years with the vaccine programme. Other countries made similar claims. Charges were lodged by Tanzania, Nicaragua, Mexico, and the Philippines. The Gardasil vaccine claimed to protect against a genital 'virus' known as HPV has also been linked to infertility. Big Pharma and the WHO (same thing) are criminal and satanic entities. Then there's the Bill Gates Foundation which is connected through funding and shared interests with 20 pharmaceutical giants and laboratories. He stands accused of directing the policy of United Nations Children's Fund (UNICEF), vaccine alliance GAVI, and other groupings, to advance the vaccine agenda and silence opposition at great cost to women and children. At the same time Gates wants to reduce the global Great Reset = Smart Grid = new human The Cult agenda I have been exposing for 30 years is now being openly promoted by Cult assets like Gates and Klaus Schwab of the World Economic Forum under code-terms like the 'Great Reset', 'Build Back Beŕer' and 'a rare but narrow window of opportunity to reflect, reimagine, and reset our world'. What provided this 'rare but narrow window of opportunity'? The 'Covid' hoax did. Who created that? They did. My books from not that long ago warned about the planned 'Internet of Things' (IoT) and its implications for human freedom. This was the plan to connect all technology to the Internet and artificial intelligence and today we are way down that road with an estimated 36 billion devices connected to the World Wide Web and that figure is projected to be 76 billion by 2025. I further warned that the Cult planned to go beyond that to the Internet of Everything when the human brain was connected via AI to the Internet and Kurzweil's 'cloud'. Now we have Cult operatives like Schwab calling for precisely

that under the term 'Internet of Bodies', a fusion of the physical, digital and biological into one centrally-controlled Smart Grid system which the Cult refers to as the 'Fourth Industrial Revolution'. They talk about the 'biological', but they really mean the synthetic-biological which is required to fully integrate the human body and brain into the Smart Grid and artificial intelligence planned to replace the human mind. We have everything being synthetically manipulated including the natural world through GMO and smart dust, the food we eat and the human body itself with synthetic 'vaccines'. I said in The Answer that we would see the Cult push for synthetic meat to replace animals and in February, 2021, the so predictable psychopath Bill Gates called for the introduction of synthetic meat to save us all from 'climate change'. The climate hoax just keeps on giving like the 'Covid' hoax. The war on meat by vegan activists is a carbon (oops, sorry) copy of the manipulation of transgender activists. They have no idea (except their inner core) that they are being used to promote and impose the agenda of the Cult or that they are only the vehicle and not the reason. This is not to say those who choose not to eat meat shouldn't be respected and supported in that right, but there are ulterior motives for those in power. A Forbes article in December, 2019, highlighted the plan so beloved of Schwab and the Cult under the heading: 'What Is The Internet of Bodies? And How Is It Changing Our World?' The article said the human body is the latest data platform (remember 'our vaccine is an operating system'). Forbes described the plan very accurately and the words could have come straight out of my books from long before: The Internet of Bodies (IoB) is an extension of the IoT and basically connects the human body to a network through devices that are ingested, implanted, or connected to the body in some way. Once connected, data can be exchanged, and the body and device can be remotely monitored and controlled. They were really describing a human hive mind with human perception centrally-dictated via an AI connection as well as allowing people to be 'remotely monitored and controlled'. Everything from a fridge to a human mind could be directed from a central point by these insane psychopaths and 'Covid vaccines' are crucial to this. Forbes explained the process I mentioned earlier of holdable and wearable technology followed by implantable.



The article said there were three generations of the Internet of Bodies that Body external: These are wearable devices such as Apple Watches or Fitbits that can monitor our health. Body internal: These include pacemakers, cochlear implants, and digital pills that go inside our bodies to monitor or control various aspects of health. Body embedded: The third generation of the Internet of Bodies is embedded technology where technology and the human body are melded together and have a real-time connection to a remote Forbes noted the development of the Brain Computer Interface (BCI) which merges the brain with an external device for monitoring and controlling in real-time. 'The ultimate goal is to help restore function to individuals with disabilities by using brain signals rather than conventional neuromuscular pathways.' Oh, do fuck off. The goal of brain interface technology is controlling human thought and emotion from the central point in a hive mind serving its masters wishes. Many people are now agreeing to be chipped to open doors without a key. You can recognise them because they'll be wearing a mask, social distancing and lining up for the 'vaccine'. The Cult plans a Great Reset money system aŕer they have completed the demolition of the global economy in which 'money' will be exchanged through communication with body operating systems. Rand Corporation, a Cult-owned think tank, said of the Internet of Bodies or IoB: Internet of Bodies technologies fall under the broader IoT umbrella. But as the name suggests, IoB devices introduce an even more intimate interplay between humans and gadgets. IoB devices monitor the human body, collect health metrics and other personal information, and transmit those data over the Internet. Many devices, such as fitness trackers, are already in use ... IoB devices ... and those in development can track, record, and store users' whereabouts, bodily functions, and what they see, hear, and even think. Schwab's World Economic Forum, a long-winded way of saying 'fascism' or 'the Cult', has gone full-on with the Internet of Bodies in the 'Covid' era. 'We're entering the era of the Internet of Bodies', it declared, 'collecting our physical data via a range of devices that can be implanted, swallowed or worn'. The result would be a huge amount of health-related data that could improve human wellbeing around the world, and prove crucial in fighting the 'Covid-19 pandemic'. Does

anyone think these clowns care about 'human wellbeing' after the death and devastation their pandemic hoax has purposely caused? Schwab and co say we should move forward with the Internet of Bodies because 'Keeping track of symptoms could help us stop the spread of infection, and quickly detect new cases'. How wonderful, but keeping track is all they are really bothered about. Researchers were investigating if data gathered from smartwatches and similar devices could be used as viral infection alerts by tracking the user's heart rate and breathing. Schwab said in his 2018 book *Shaping the Future of the Fourth Industrial Revolution*: The lines between technologies and beings are becoming blurred and not just by the ability to create lifelike robots or synthetics. Instead it is about the ability of new technologies to literally become part of us. Technologies already influence how we understand ourselves, how we think about each other, and how we determine our realities. As the technologies ... give us deeper access to parts of ourselves, we may begin to integrate digital technologies into our You can see what the game is. Twenty-four hour control and people – if you could still call them that – would never know when something would go ping and take them out of circulation. It's the most obvious rush to a global fascist dictatorship and the complete submission of humanity and yet still so many are locked away in their Cult-induced perceptual coma and can't see it. Smart Grid control centres The human body is being transformed by the 'vaccines' and in other ways into a synthetic cyborg that can be attached to the global Smart Grid which would be controlled from a central point and other sub- locations of Grid manipulation. Where are these planned to be? Well, China for a start which is one of the Cult's biggest centres of operation. The technological control system and technocratic rule was incubated here to be unleashed across the world after the 'Covid' hoax came out of China in 2020. Another Smart Grid location that will surprise people new to this is Israel. I have exposed in *The Trigger* how Sabbatian technocrats, intelligence and military operatives were behind the horrors of 9/11 and not '19 Arab hijackers' who somehow manifested the ability to pilot big passenger airliners when instructors at puddle-jumping flying schools described some of them as a joke. The 9/11 attacks were made possible through

control of civilian and military air computer systems and those of the White House, Pentagon and connected agencies. See The Trigger – it will blow your mind. The controlling and coordinating force were the Sabbatian networks in Israel and the United States which by then had infiltrated the entire US government, military and intelligence system. The real name of the American Deep State is 'Sabbatian State'. Israel is a tiny country of only nine million people, but it is one of the global centres of cyber operations and fast catching Silicon Valley in importance to the Cult. Israel is known as the 'start-up nation' for all the cyber companies spawned there with the Sabbatian specialisation of 'cyber security' that I mentioned earlier which gives those companies access to computer systems of their clients in real time through 'backdoors' written into the coding when security software is downloaded. The Sabbatian centre of cyber operations outside Silicon Valley is the Israeli military Cyber Intelligence Unit, the biggest infrastructure project in Israel's history, headquartered in the desert-city of Beersheba and involving some 20,000 'cyber soldiers'. Here are located a literal army of Internet trolls scanning social media, forums and comment lists for anyone challenging the Cult agenda. The UK military has something similar with its 77th Brigade and associated operations. The Beersheba complex includes research and development centres for other Cult Packard, Cisco Systems, Facebook and Motorola. Techcrunch.com ran an article about the Beersheba global Internet technology centre headlined 'Israel's desert city of Beersheba is turning into a cybertech'. The military's massive relocation of its prestigious technology units, the presence of multinational and local companies, a close proximity to Ben Gurion University and generous government subsidies are turning Beersheba into a major global cybertech hub. Beersheba has all of the ingredients of a vibrant security technology ecosystem, including Ben Gurion University with its graduate program in cybersecurity and Cyber Security Research Center, and Lockheed Martin. It's also the future home of the INCB (Israeli National Cyber Bureau); offers a special income tax incentive for cyber security companies, and was the site for the relocation of the army's intelligence corps units. Sabbatians have taken over the cyber world through the following process: They scan the schools for likely cyber talent and

develop them at Ben Gurion University and their period of conscription in the Israeli Defense Forces when they are stationed at the Beersheba complex. When the cyber talented officially leave the army they are funded to start cyber companies with technology developed by themselves or given to them by the state. Much of this is stolen through backdoors of computer systems around the world with America top of the list. Others are sent off to Silicon Valley to start companies or join the major ones and so we have many major positions filled by apparently 'Jewish' but really Sabbatian operatives. Google, YouTube and Facebook are all run by 'Jewish' CEOs while Twiŕer is all but run by ultra-Zionist hedge-fund shark Paul Singer. At the centre of the Sabbatian global cyber web is the Israeli army's Unit 8200 which specialises in hacking into computer systems of other countries, inserting viruses, gathering information, instigating malfunction, and even taking control of them from a distance. A long list of Sabbatians involved with 9/11, Silicon Valley and Israeli cyber security companies are operatives of Unit 8200. This is not about Israel. It's about the Cult. Israel is planned to be a Smart Grid hub as with China and what is happening at Beersheba is not for the benefit of Jewish people who are treated disgustingly by the Sabbatian elite that control the country. A glance at the Nuremberg Codes will tell you that. The story is much bigger than 'Covid', important as that is to where we are being taken. Now, though, it's time to really strap in. There's more ... much more ... Who controls the Cult? Awake, arise or be forever fall'n John Milton, Paradise Lost have exposed this far the level of the Cult conspiracy that operates in the world of the seen and within the global secret society and satanic network which operates in the shadows one step back from the seen. The story, however, goes much deeper than that. The 'Covid' hoax is major part of the Cult agenda, but only part, and to grasp the biggest picture we have to expand our aŕtention beyond the realm of human sight and into the infinity of possibility that we cannot see. It is from here, ultimately, that humanity is being manipulated into a state of total control by the force which dictates the actions of the Cult. How much of reality can we see? Next to damn all is the answer. We may appear to see all there is to see in the 'space' our eyes survey and observe, but liŕle could be further from the

truth. The human 'world' is only a tiny band of frequency that the body's visual and perceptual systems can decode into perception of a 'world'. According to mainstream science the electromagnetic spectrum is 0.005 percent of what exists in the Universe (Fig 10). The maximum estimate I have seen is 0.5 percent and either way it's miniscule. I say it is far, far, smaller even than 0.005 percent when you compare reality we see with the totality of reality that we don't. Now get this if you are new to such information: Visible light, the only band of frequency that we can see, is a fraction of the 0.005 percent (Fig 11 overleaf). Take this further and realise that our universe is one of infinite universes and that universes are only a fragment of overall reality – infinite reality. Then compare that with the almost infinitesimal frequency band of visible light or human sight. You see that humans are as near blind as it is possible to be without actually being so. Artist and filmmaker, Sergio Toporek, Figure 10: Humans can perceive such a tiny band of visual reality it's laughable. Figure 11: We can see a smear of the 0.005 percent electromagnetic spectrum, but we still know it all. Yep, makes sense. Consider that you can see less than 1% of the electromagnetic spectrum and hear less than 1% of the acoustic spectrum. 90% of the cells in your body carry their own microbial DNA and are not 'you'. The atoms in your body are 99.999999999999999% empty space and none of them are the ones you were born with ... Human beings have 46 chromosomes, two less than a potato. The existence of the rainbow depends on the conical photoreceptors in your eyes; to animals without cones, the rainbow does not exist. So you don't just look at a rainbow, you create it. This is pretty amazing, especially considering that all the beautiful colours you see represent less than 1% of the electromagnetic spectrum. Suddenly the 'world' of humans looks a very different place. Take into account, too, that Planet Earth when compared with the projected size of this single universe is the equivalent of a billionth of a pinhead. Imagine the ratio that would be when compared to infinite reality. To think that Christianity once insisted that Earth and humanity were the centre of everything. This background is vital if we are going to appreciate the nature of 'human' and how we can be manipulated by an unseen force. To human visual reality virtually everything is unseen and yet the prevailing perception

within the institutions and so much of the public is that if we can't see it, touch it, hear it, taste it and smell it then it cannot exist. Such perception is indoctrinated and encouraged by the Cult and its agents because it isolates believers in the strictly limited, village-idiot, realm of the five senses where perceptions can be firewalled and information controlled. Most of those perpetuating the 'this-world-is-all-there-is' insanity are themselves indoctrinated into believing the same delusion. While major players and influencers know that official reality is laughable most of those in science, academia and medicine really believe the nonsense they peddle and teach succeeding generations. Those who challenge the orthodoxy are dismissed as nujers and freaks to protect the manufactured illusion from exposure. Observe the dynamic of the 'Covid' hoax and you will see how that takes the same form. The inner-circle psychopaths knows it's a gigantic scam, but almost the entirety of those imposing their fascist rules believe that 'Covid' is all that they're told it is. Ask people who they are and they will give you their name, place of birth, location, job, family background and life story. Yet that is not who they are – it is what they are experiencing. The difference is absolutely crucial. The true 'I', the eternal, infinite 'I', is consciousness, a state of being aware. Forget 'form'. That is a vehicle for a brief experience. Consciousness does not come from the brain, but through the brain and even that is more symbolic than literal. We are awareness, pure awareness, and this is what withdraws from the body at what we call 'death' to continue our eternal beingness, isness, in other realms of reality within the limitlessness of infinity or the Biblical 'many mansions in my father's house'. Labels of a human life, man, woman, transgender, black, white, brown, nationality, circumstances and income are not who we are. They are what we are – awareness – is experiencing in a brief connection with a band of frequency we call 'human'. The labels are not the self; they are, to use the title of one of my books, a Phantom Self. I am not David Icke born in Leicester, England, on April 29th, 1952. I am the consciousness having that experience. The Cult and its non-human masters seek to convince us through the institutions of 'education', science, medicine, media and government that what we are experiencing is who we are. It's so easy to control and direct perception locked away in the bewildered illusions of

the five senses humanity aware of its true self and its true power to consciously create its reality and experience. How is it possible to do this? We do it all day every day. If you perceive yourself as 'little me' with no power to impact upon your life and the world then your life experience will reflect that. You will hand the power you don't think you have to authority in all its forms which will use it to control your experience. This, in turn, will appear to confirm your perception of 'little me' in a self-fulfilling feedback loop. But that is what 'little me' really is – a perception. We are all 'big-me', infinite me, and the Cult has to make us forget that if its will is to prevail. We are therefore manipulated and pressured into self-identifying with human labels and not the consciousness/awareness experiencing those human. The phenomenon of identity politics is a Cult-instigated manipulation technique to sub-divide previous labels into even smaller ones. A United States university employs this list of letters to describe student identity: LGBTQFAGPBDSM or lesbian, gay, bisexual, transgender, transsexual, queer, questioning, flexual, asexual, gender-fuck, polyamorous, bondage/discipline, dominance/submission and sadism/masochism. I'm sure other lists are even longer by now as people feel the need to self-identity the 'I' with the minutiae of race and sexual preference. Workers programmed by the Cult for generations believe this is about 'inclusivity' when it's really the Cult locking them away into smaller and smaller versions of Phantom Self while firewalling them from the influence of their true self, the infinite, eternal 'I'. You may notice that my philosophy which contends that we are all unique points of attention/awareness within the same infinite whole or Oneness is the ultimate non-racism. The very sense of Oneness makes the judgement of people by their body-type, colour or sexuality utterly ridiculous and confirms that racism has no understanding of reality (including anti-white racism). Yet despite my perception of life Cult agents and fast-asleep Workers label me racist to discredit my information while they are themselves phenomenally racist and sexist. All they see is race and sexuality and they judge people as good or bad, demons or untouchables, by their race and sexuality. All they see is Phantom Self and perceive themselves in terms of Phantom Self. They are pawns and puppets of the Cult agenda to focus attention and self-identity in the five senses

and play those identities against each other to divide and rule. Columbia University has introduced segregated graduations in another version of social distancing designed to drive people apart and teach them that different racial and cultural groups have nothing in common with each other. The last thing the Cult wants is unity. Again the pump-primers of this will be Cult operatives in the knowledge of what they Phantom Self blind. We do have something in common – we are all the same consciousness having different temporary experiences. What is this ‘human’? Yes, what is ‘human’? That is what we are supposed to be, right? I mean ‘human’? True, but ‘human’ is the experience not the ‘I’. Break it down to basics and ‘human’ is the way that information is processed. If we are to experience and interact with this band of frequency we call the ‘world’ we must have a vehicle that operates within that band of frequency. Our consciousness in its prime form cannot do that; it is way beyond the frequency of the human realm. My consciousness or awareness could not tap these keys and pick up the cup in front of me in the same way that radio station A cannot interact with radio station B when they are on different frequencies. The human body is the means through which we have that interaction. I have long described the body as a biological computer which processes information in a way that allows consciousness to experience this reality. The body is a receiver, transmitter and processor of information in a particular way that we call human. We visually perceive only the world of the five senses in a wakened state – that is the limit of the body’s visual decoding system. In truth it’s not even visual in the way we experience ‘visual reality’ as I will come to in a moment. We are ‘human’ because the body processes the information sources of human into a reality and behaviour system that we perceive as human. Why does an elephant act like an elephant and not like a human or a duck? The elephant’s biological computer is a different information field and processes information according to that program into a visual and behaviour type we call an elephant. The same applies to everything in our reality. These body information fields are perpetuated through procreation (like making a copy of a software program). The Cult wants to break that cycle and intervene technologically to transform the human information field into one that will change what we



call humanity. If it can change the human information field it will change the way that field processes information and change humanity both 'physically' and psychologically. Hence the messenger (information) RNA 'vaccines' and so much more that is targeting human genetics by changing the body's information – messaging – construct through food, drink, radiation, toxicity and other means. Reality that we experience is nothing like reality as it really is in the same way that the reality people experience in virtual reality games is not the reality they are really living in. The game is only a decoded source of information that appears to be a reality. Our world is also an information construct – a simulation (more later). In its base form our reality is a wavefield of information much the same in theme as Wi-Fi. The five senses decode wavefield information into electrical information which they communicate to the brain to decode into holographic (illusory 'physical') information. Different parts of the brain specialise in decoding different senses and the information is fused into a reality that appears to be outside of us but is really inside the brain and the genetic structure in general (Fig 12 overleaf). DNA is a receiver-transmitter of information and a vital part of this decoding process and the body's connection to other realities. Change DNA and you change the way we decode and connect with reality – see 'Covid vaccines'. Think of computers decoding Wi-Fi. You have information encoded in a radiation field and the computer decodes that information into a very different form on the screen. You can't see the Wi-Fi until its information is made manifest on the screen and the information on the screen is inside the computer and not outside. I have just described how we decode the 'human world'. All five senses decode the waveform 'Wi- Fi' field into electrical signals and the brain (computer) constructs reality inside the brain and not outside – 'You don't just look at a rainbow, you create it'. Sound is a simple example. We don't hear sound until the brain decodes it. Waveform sound waves are picked up by the hearing sense and communicated to the brain in an electrical form to be decoded into the sounds that we hear. Everything we hear is inside the brain along with everything we see, feel, smell and taste. Words and language are waveform fields generated by our vocal chords which pass through this process until they are decoded by the brain into words that we

hear. Different languages are different frequency fields or sound waves generated by vocal chords. Late British philosopher Alan Watts said: Figure 12: The brain receives information from the five senses and constructs from that our [Without the brain] the world is devoid of light, heat, weight, solidity, motion, space, time or any other imaginable feature. All these phenomena are interactions, or transactions, of vibrations with a certain arrangement of neurons. That's exactly what they are and scientist Robert Lanza describes in his book, Biocentrism, how we decode electromagnetic waves and energy into visual and 'physical' experience. He uses the example of a flame emitting photons, electromagnetic energy, each pulsing electrically and magnetically: ... these ... invisible electromagnetic waves strike a human retina, and if (and only if) the waves happen to measure between 400 and 700 nanometers in length from crest to crest, then their energy is just right to deliver a stimulus to the 8 million cone-shaped cells in the retina. Each in turn send an electrical pulse to a neighbour neuron, and on up the line this goes, at 250 mph, until it reaches the ... occipital lobe of the brain, in the back of the head. There, a cascading complex of neurons fire from the incoming stimuli, and we subjectively perceive this experience as a yellow brightness occurring in a place we have been conditioned to call the 'external world'. You hear what you decode. If a tree falls or a building collapses they make no noise unless someone is there to decode the energetic waves generated by the disturbance into what we call sound. Does a falling tree make a noise? Only if you hear it – decode it. Everything in our reality is a frequency field of information operating within the overall 'Wi-Fi' field that I call The Field. A vibrational disturbance is generated in The Field by the fields of the falling tree or building. These disturbance waves are what we decode into the sound of them falling. If no one is there to do that then neither will make any noise. Reality is created by the observer – decoder – and the perceptions of the observer affect the decoding process. For this reason different people – different perceptions – will perceive the same reality or situation in a different way. What one may perceive as a nightmare another will see as an opportunity. The question of why the Cult is so focused on controlling human perception now answers itself. All experienced reality is the act of decoding and we don't

experience Wi-Fi until it is decoded on the computer screen. The sight and sound of an Internet video is encoded in the Wi-Fi all around us, but we don't see or hear it until the computer decodes that information. Taste, smell and touch are all phenomena of the brain as a result of the same process. We don't taste, smell or feel anything except in the brain and there are pain relief techniques that seek to block the signal from the site of discomfort to the brain because if the brain doesn't decode that signal we don't feel pain. Pain is in the brain and only appears to be at the point of impact thanks to the feedback loop between them. We don't see anything until electrical information from the sight senses is decoded in an area at the back of the brain. If that area is damaged we can go blind when our eyes are perfectly okay. So why do we go blind if we damage an eye? We damage the information processing between the waveform visual information and the visual decoding area of the brain. If information doesn't reach the brain in a form it can decode then we can't see the visual reality that it represents. What's more the brain is decoding only a fraction of the information it receives and the rest is absorbed by the sub-conscious mind. This explanation is from the science magazine, Every second, 11 million sensations crackle along these [brain] pathways ... The brain is confronted with an alarming array of images, sounds and smells which it rigorously filters down until it is left with a manageable list of around 40. Thus 40 sensations per second make up what we perceive as reality. The 'world' is not what people are told to believe that is it and the inner circles of the Cult know that. Illusory 'physical' reality We can only see a smear of 0.005 percent of the Universe which is only one of a vast array of universes – 'mansions' – within infinite reality. Even then the brain decodes only 40 pieces of information ('sensations') from a potential 11 million that we receive every second. Two points strike you from this immediately: The sheer breathtaking stupidity of believing we know anything so rigidly that there's nothing more to know; and the potential for these processes to be manipulated by a malevolent force to control the reality of the population. One thing I can say for sure with no risk of contradiction is that when you can perceive an almost indescribable fraction of infinite reality there is always more to know as in tidal waves of it. Ancient Greek

philosopher Socrates was so right when he said that wisdom is to know how little we know. How obviously true that is when you think that we are experiencing a physical world of solidity that is neither physical nor solid and a world of apartness when everything is connected. Cult-controlled 'science' dismisses the so-called 'paranormal' and all phenomena related to that when the 'para'-normal is perfectly normal and explains the alleged 'great mysteries' which dumbfound scientific minds. There is a reason for this. A 'scientific mind' in terms of the mainstream is a material mind, a five-sense mind imprisoned in see it, touch it, hear it, smell it and taste it. Phenomena and happenings that can't be explained that way leave the 'scientific mind' bewildered and the rule is that if they can't account for why something is happening then it can't, by definition, be happening. I beg to differ. Telepathy is thought waves passing through The Field (think wave disturbance again) to be decoded by someone able to connect with that wavelength (information). For example: You can pick up the thought waves of a friend at any distance and at the very least that will bring them to mind. A few minutes later the friend calls you. 'My god', you say, 'that's incredible – I was just thinking of you.' Ah, but they were thinking of you before they made the call and that's what you decoded. Native peoples not entrapped in five-sense reality do this so well it became known as the 'bush telegraph'. Those known as across dimensions of reality. 'Mind over matter' comes from the fact that matter and mind are the same. The state of one influences the state of the other. Indeed one and the other are illusions. They are aspects of the same field. Paranormal phenomena are all explainable so why are they still considered 'mysteries' or not happening? Once you go down this road of understanding you begin to expand awareness beyond the five senses and that's the nightmare for the

Figure 13: Holograms are not solid, but the best ones appear to be. Figure 14: How holograms are created by capturing a waveform version of the subject image. Our reality is not solid, it is holographic. We are now well aware of holograms which are widely used today. Two-dimensional information is decoded into a three-dimensional reality that is not solid although can very much appear to be (Fig 13). Holograms are created with a laser divided into two parts. One goes directly onto a

holographic photographic print ('reference beam') and the other takes a waveform image of the subject ('working beam') before being directed onto the print where it 'collides' with the other half of the laser (Fig 14). This creates a waveform interference pattern which contains the wavefield information of whatever is being photographed (Fig 15 overleaf). The process can be likened to dropping pebbles in a pond. Waves generated by each one spread out across the water to collide with the others and create a wave representation of where the stones fell and at what speed, weight and distance. A waveform interference pattern of a hologram is akin to the waveform information in The Field which the five senses decode into electrical signals to be decoded by the brain into a holographic illusory 'physical' reality. In the same way when a laser (think human attention) is directed at the waveform interference pattern a three-dimensional version of the subject is projected into apparently 'solid' reality (Fig 16). An amazing trait of holograms reveals more 'paranormal mysteries'. Information of the whole hologram is encoded in waveform in every part of the interference pattern by the way they are created. This means that every part of a hologram is a smaller version of the whole. Cut the interference wave-pattern into four and you won't get four parts of the image. You get quarter-sized versions of the whole image. The body is a hologram and the same applies. Here we have the basis of acupuncture, reflexology and other forms of healing which identify representations of the whole body in all of the parts, hands, feet, ears, everywhere. Skilled palm readers can do what they do because the information of whole body is encoded in the hand. The concept of as above, so below, comes from this. Figure 15: A waveform interference pattern that holds the information that transforms into a Figure 16: Holographic people including 'Elvis' holographically inserted to sing a duet with The question will be asked of why, if solidity is illusory, we can't just walk through walls and each other. The resistance is not solid against solid; it is electromagnetic field against electromagnetic field and we decode this into the experience of solid against solid. We should also not underestimate the power of belief to dictate reality. What you believe is impossible will be. Your belief impacts on your decoding processes and they won't decode what you think is impossible. What we believe we perceive

and what we perceive we experience. 'Can't dos' and 'impossibles' are like a firewall in a computer system that won't put on the screen what the firewall blocks. How vital that is to understanding how human experience has been hijacked. I explain in *The Answer, Everything You Need To Know But Have Never Been Told* and other books a long list of 'mysteries' and 'paranormal' phenomena that are not mysterious and perfectly normal once you realise what reality is and how it works. 'Ghosts' can be seen to pass through 'solid' walls because the walls are not solid and the ghost is a discarnate entity operating on a frequency so different to that of the wall that it's like two radio stations sharing the same space while never interfering with each other. I have seen ghosts do this myself. The apartness of people and objects is also an illusion. Everything is connected by the Field like all sea life is connected by the sea. It's just that within the limits of our visual reality we only 'see' holographic information and not the field of information that connects everything and from which the holographic world is made manifest. If you can only see holographic 'objects' and not the field that connects them they will appear to you as unconnected to each other in the same way that we see the computer while not seeing the Wi-Fi. What you don't know can hurt you Okay, we return to those 'two worlds' of human society and the Cult with its global network of interconnecting secret societies and satanic groups which manipulate through governments, corporations, media, religions, etc. The fundamental difference between them is knowledge. The idea has been to keep humanity ignorant of the plan for its total enslavement underpinned by a crucial ignorance of reality – who we are and where we are – and how we interact with it. 'Human' should be the interaction between our expanded eternal consciousness and the five-sense body experience. We are meant to be in this world in terms of the five senses but not of this world in relation to our greater consciousness and perspective. In that state we experience the small picture of the five senses within the wider context of the big picture of awareness beyond the five senses. Put another way the five senses see the dots and expanded awareness connects them into pictures and patterns that give context to the apparently random and unconnected. Without the context of expanded awareness the five senses see only apartness

and randomness with apparently no meaning. The Cult and its other-dimensional controllers seek to intervene in the frequency realm where five-sense reality is supposed to connect with expanded reality and to keep the two apart (more on this in the final chapter). When that happens five-sense mental and emotional processes are no longer influenced by expanded awareness, or the True 'I', and instead are driven by the isolated perceptions of the body's decoding systems. They are in the world and of it. Here we have the human plight and why humanity with its potential for infinite awareness can be so easily manipulatable and descend into such extremes of stupidity. Once the Cult isolates five-sense mind from expanded awareness it can then program the mind with perceptions and beliefs by controlling information that the mind receives through the 'education' system of the formative years and the media perceptual bombardment and censorship of an entire lifetime. Limit perception and a sense of the possible through limiting knowledge by limiting and skewing information while censoring and discrediting that which could set people free. As the title of another of my books says ... And The Truth Shall Set You Free. For this reason the last thing the Cult wants in circulation is the truth about anything – especially the reality of the eternal 'I' – and that's why it is desperate to control information. The Cult knows that information becomes perception which becomes behaviour which, collectively, becomes human society. Cult-controlled and funded mainstream 'science' denies the existence of an eternal 'I' and seeks to dismiss and trash all evidence to the contrary. Cult-controlled mainstream religion has a version of 'God' that is little more than a system of control and dictatorship that employs threats of damnation in an afterlife to control perceptions and behaviour in the here and now through fear and guilt. Neither is true and it's the 'neither' that the Cult wishes to suppress. This 'neither' is that everything is an expression, a point of attention, within an infinite state of consciousness which is the real meaning of the term 'God'. Perceptual obsession with the 'physical body' and five-senses means that 'God' becomes personified as a bearded bloke sitting among the clouds or a raging bully who loves us if we do what 'he' wants and condemns us to the fires of hell if we don't. These are no more than a 'spiritual' fairy tales to control and dictate events and

behaviour through fear of this 'God' which has bizarrely made 'God-fearing' in religious circles a state to be desired. I would suggest that fearing anything is not to be encouraged and celebrated, but rather deleted. You can see why 'God fearing' is so beneficial to the Cult and its religions when they decide what 'God' wants and what 'God' demands (the Cult demands) that everyone do. As the great American comedian Bill Hicks said satirising a Christian zealot: 'I think what God meant to say.' How much of this infinite awareness ('God') that we access is decided by how far we choose to expand our perceptions, self-identity and sense of the possible. The scale of self-identity reflects itself in the scale of awareness that we can connect with and are influenced by – how much knowing and insight we have instead of programmed perception. You cannot expand your awareness into the infinity of possibility when you believe that you are like me Peter the postman or Mary in marketing and nothing more. I'll deal with this in the concluding chapter because it's crucial to how we turnaround current events.

Where the Cult came from When I realised in the early 1990s there was a Cult network behind global events I asked the obvious question: When did it start? I took it back to ancient Rome and Egypt and on to Babylon and Sumer in Mesopotamia, the 'Land Between Two Rivers', in what we now call Iraq. The two rivers are the Tigris and Euphrates and this region is of immense historical and other importance to the Cult, as is the land called Israel only 550 miles away by air. There is much more going with deep esoteric meaning across this whole region. It's not only about 'wars for oil'. Priceless artefacts from Mesopotamia were stolen or destroyed after the American and British invasion of Iraq in 2003 justified by the lies of George Bush and Tony Blair (their Cult masters) about non-existent 'weapons of mass destruction'. Mesopotamia was the location of Sumer (about 5,400BC to 1,750BC), and Babylon (about 2,350BC to 539BC). Sabbatians may have become immensely influential in the Cult in modern times but they are part of a network that goes back into the mists of history. Sumer is said by historians to be the 'cradle of civilisation'. I disagree. I say it was the re-start of what we call human civilisation after cataclysmic events symbolised in part as the 'Great Flood' destroyed the world that existed before. These fantastic upheavals that I have been describing in detail



in the books since the early 1990s appear in accounts and legends of ancient cultures across the world and they are supported by geological and biological evidence. Stone tablets found in Iraq detailing the Sumer period say the cataclysms were caused by non-human 'gods' they call the Anunnaki. These are described in terms of extraterrestrial visitations in which knowledge supplied by the Anunnaki is said to have been the source of at least one of the world's oldest writing systems and developments in astronomy, mathematics and architecture that were way ahead of their time. I have covered this subject at length in *The Biggest Secret* and *Children of the Matrix* and the same basic 'Anunnaki' story can be found in Zulu accounts in South Africa where the late and very great Zulu high shaman Credo Mutwa told me that the Sumerian Anunnaki were known by Zulus as the Chitauri or 'children of the serpent'. See my six-hour video interview with Credo on this subject entitled *The Reptilian Agenda* recorded at his then home near Johannesburg in 1999 which you can watch on the Ickonic media platform. The Cult emerged out of Sumer, Babylon and Egypt (and elsewhere) and established the Roman Empire before expanding with the Romans into northern Europe from where many empires were savagely imposed in the form of Cult-controlled societies all over the world. Mass death and destruction was their calling card. The Cult established its centre of operations in Europe and European Empires were Cult empires which allowed it to expand into a global force. Spanish and Portuguese colonialists headed for Central and South America while the British and French targeted North America. Africa was colonised by Britain, France, Belgium, the Netherlands, Portugal, Spain, Italy, and Germany. Some like Britain and France moved in on the Middle East. The British Empire was by far the biggest for a simple reason. By now Britain was the headquarters of the Cult from which it expanded to form Canada, the United States, Australia and New Zealand. The Sun never set on the British Empire such was the scale of its occupation. London remains a global centre for the Cult along with Rome and the Vatican although others have emerged in Israel and China. It is no accident that the 'virus' is alleged to have come out of China while Italy was chosen as the means to terrify the Western population into compliance with 'Covid' fascism. Nor that Israel has led the world in 'Covid' fascism and

mass 'vaccination'. You would think that I would mention the United States here, but while it has been an important means of imposing the Cult's will it is less significant than would appear and is currently in the process of having what power it does have deleted. The Cult in Europe has mostly loaded the guns for the US to fire. America has been controlled from Europe from the start through Cult operatives in Britain and Europe. The American Revolution was an illusion to make it appear that America was governing itself while very different forces were pulling the strings in the form of Cult families such as the Rothschilds through the Rockefellers and other subordinates. The Rockefellers are extremely close to Bill Gates and established both scalpel and drug 'medicine' and the World Health Organization. They play a major role in the development and circulation of vaccines through the Rockefeller Foundation on which Bill Gates said his Foundation is based. Why wouldn't this be the case when the Rockefellers and Gates are on the same team? Cult infiltration of human society goes way back into what we call history and has been constantly expanding and centralising power with the goal of establishing a global structure to dictate everything. Look how this has been advanced in great leaps with the 'Covid' hoax. The non-human dimension I researched and observed the comings and goings of Cult operatives through the centuries and even thousands of years as they were born, worked to promote the agenda within the secret society and satanic networks, and then died for others to replace them. Clearly there had to be a coordinating force that spanned this entire period while operatives who would not have seen the end goal in their lifetimes came and went advancing the plan over millennia. I went in search of that coordinating force with the usual support from the extraordinary synchronicity of my life which has been an almost daily experience since 1990. I saw common themes in religious texts and ancient cultures about a non-human force manipulating human society from the hidden. Christianity calls this force Satan, the Devil and demons; Islam refers to the Jinn or Djinn; Zulus have their Chitauri (spelt in other ways in different parts of Africa); and the Gnostic people in Egypt in the period around and before 400AD referred to this phenomena as the 'Archons', a word meaning rulers in Greek. Central American cultures speak

of the 'Predators' among other names and the same theme is everywhere. I will use 'Archons' as a collective name for all of them. When you see how their nature and behaviour is described all these different sources are clearly talking about the same force. Gnostics described the Archons in terms of 'luminous fire' while Islam relates the Jinn to 'smokeless fire'. Some refer to beings in form that could occasionally be seen, but the most common of common theme is that they operate from unseen realms which means almost all existence to the visual processes of humans. I had concluded that this was indeed the foundation of human control and that the Cult was operating within the human frequency band on behalf of this hidden force when I came across the writings of Gnostics which supported my conclusions in the most extraordinary way. A sealed earthen jar was found in 1945 near the town of Nag Hammadi about 75-80 miles north of Luxor on the banks of the River Nile in Egypt. Inside was a treasure trove of manuscripts and texts left by the Gnostic people some 1,600 years earlier. They included 13 leather-bound papyrus codices (manuscripts) and more than 50 texts written in Coptic Egyptian estimated to have been hidden in the jar in the period of 400AD although the source of the information goes back much further. Gnostics oversaw the Great or Royal Library of Alexandria, the fantastic depository of ancient texts detailing advanced knowledge and accounts of human history. The Library was dismantled and destroyed in stages over a long period with the death-blow delivered by the Cult-established Roman Church in the period around 415AD. The Church of Rome was the Church of Babylon relocated as I said earlier. Gnostics were not a race. They were a way of perceiving reality. Whenever they established themselves and their information circulated the terrorists of the Church of Rome would target them for destruction. This happened with the Great Library and with the Gnostic Cathars who were burned to death by the psychopaths after a long period of oppression at the siege of the Castle of Monségur in southern France in 1244. The Church has always been terrified of Gnostic information which demolishes the official Christian narrative although there is much in the Bible that supports the Gnostic view if you read it in another way. To anyone studying the texts of what became known as the Nag Hammadi Library it is clear that great swathes of

Christian and Biblical belief has its origin with Gnostics sources going back to Sumer. Gnostic themes have been twisted to manipulate the perceived reality of Bible believers. Biblical texts have been in the open for centuries where they could be changed while Gnostic documents found at Nag Hammadi were sealed away and untouched for 1,600 years. What you see is what they wrote. Use your pneuma not your nous Gnosticism and Gnostic come from 'gnosis' which means knowledge, or rather secret knowledge, in the sense of spiritual awareness – knowledge about reality and life itself. The desperation of the Cult's Church of Rome to destroy the Gnostics can be understood when the knowledge they were circulating was the last thing the Cult wanted the population to know. Sixteen hundred years later the same Cult is working hard to undermine and silence me for the same reason. The dynamic between knowledge and ignorance is a constant. 'Time' appears to move on, but essential themes remain the same. We are told to 'use your nous', a Gnostic word for head/brain/intelligence. They said, however, that spiritual awakening or 'salvation' could only be secured by expanding awareness beyond what they called nous and into pneuma or Infinite Self. Obviously as I read these texts the parallels with what I have been saying since 1990 were fascinating to me. There is a universal truth that spans human history and in that case why wouldn't we be talking the same language 16 centuries apart? When you free yourself from the perception program of the five senses and explore expanded realms of consciousness you are going to connect with the same information no matter what the perceived 'era' within a manufactured timeline of a single and tiny range of manipulated frequency. Humans working with 'smart' technology or knocking rocks together in caves is only a timeline appearing to operate within the human frequency band. Expanded awareness and the knowledge it holds have always been there whether the era be Stone Age or computer age. We can only access that knowledge by opening ourselves to its frequency which the five-sense prison cell is. Zuckerberg, Brin, Page, Wojcicki, Bezos, and all the others behind the 'Covid' hoax clearly have a long wait before their range of frequency can make that connection given that an open heart is crucial to that as we shall see. Instead of accessing knowledge directly through

expanded awareness it is given to Cult operatives by the secret society networks of the Cult where it has been passed on over thousands of years outside the public arena. Expanded realms of consciousness is where great artists, composers and writers find their inspiration and where truth awaits anyone open enough to connect with it. We need to go there fast. A fiġh of the Nag Hammadi texts describe the existence and manipulation of the Archons led by a 'Chief Archon' they call 'Yaldabaoth', or the 'Demiurge', and this is the Christian 'Devil', 'Satan', 'Lucifer', and his demons. Archons in Biblical symbolism are the 'fallen ones' which are also referred to as fallen angels aġer the angels expelled from heaven according to the Abrahamic religions of Judaism, Christianity and Islam. These angels are claimed to tempt humans to 'sin' ongoing and you will see how accurate that symbolism is during the rest of the book. The theme of 'original sin' is related to the 'Fall' when Adam and Eve were 'tempted by the serpent' and fell from a state of innocence and 'obedience' (connection) with God into a state of disobedience (disconnection). The Fall is said to have brought sin into the world and corrupted everything including human nature. Yaldabaoth, the 'Lord Archon', is described by Gnostics as a 'counterfeit spirit', 'The Blind One', 'The Blind God', and 'The Foolish One'. The Jewish name for Yaldabaoth in Talmudic writings is Samael which translates as 'Poison of God', or 'Blindness of God'. You see the parallels. Yaldabaoth in Islamic belief is the Muslim Jinn devil known as Shaytan – Shaytan is Satan as the same themes are found all over the world in every religion and culture. The 'Lord God' of the Old Testament is the 'Lord Archon' of Gnostic manuscripts and that's why he's such a bloodthirsty bastard. Satan is known by Christians as 'the Demon of Demons' and Gnostics called Yaldabaoth the 'Archon of Archons'. Both are known as 'The Deceiver'. We are talking about the same 'bloke' for sure and these common themes using different names, storylines and symbolism tell a common tale of the human plight. Archons are referred to in Nag Hammadi documents as mind parasites, inverters, guards, gatekeepers, detainers, judges, pitiless ones and deceivers. The 'Covid' hoax alone is a glaring example of all these things. The Biblical 'God' is so different in the Old and New Testaments because they are not describing the same phenomenon. The vindictive, angry, hate-filled, 'God' of the Old

Testament, known as Yahweh, is Yaldabaoth who is depicted in Cult-dictated popular culture as the 'Dark Lord', 'Lord of Time', Lord (Darth) Vader and Dormammu, the evil ruler of the 'Dark Dimension' trying to take over the 'Earth Dimension' in the Marvel comic movie, Dr Strange. Yaldabaoth is both the Old Testament 'god' and the Biblical 'Satan'. Gnostics referred to Yaldabaoth as the 'Great Architect of the Universe' and the Cult-controlled Freemason network calls their god 'the 'Great Architect of the Universe' (also Grand Architect). The 'Great Architect' Yaldabaoth is symbolised by the Cult as the all-seeing eye at the top of the pyramid on the Great Seal of the United States and the dollar bill. Archon is encoded in arch-itect as it is in arch-angels and arch-bishops. All religions have the theme of a force for good and force for evil in some sort of spiritual war and there is a reason for that – the theme is true. The Cult and its non-human masters are quite happy for this to circulate. They present themselves as the force for good fighting evil when they are really the force of evil (absence of love). The whole foundation of Cult modus operandi is inversion. They promote themselves as a force for good and anyone challenging them in pursuit of peace, love, fairness, truth and justice is condemned as a satanic force for evil. This has been the game plan throughout history whether the Church of Rome inquisitions of non-believers or 'conspiracy theorists' and 'anti-vaxxers' of today. The technique is the same whatever the Yaldabaoth is revolting (true) Yaldabaoth and the Archons are said to have revolted against God with Yaldabaoth claiming to be God – the All That Is. The Old Testament 'God' (Yaldabaoth) demanded to be worshipped as such: 'I am the LORD, and there is none else, there is no God beside me' (Isaiah 45:5). I have quoted in other books a man who said he was the unofficial son of the late Baron Philippe de Rothschild of the Mouton-Rothschild wine producing estates in France who died in 1988 and he told me about the Rothschild 'revolt from God'. The man said he was given the name Phillip Eugene de Rothschild and we shared long correspondence many years ago while he was living under another identity. He said that he was conceived through 'occult incest' which (within the Cult) was 'normal and to be admired'. 'Phillip' told me about his experience attending satanic rituals with rich and famous people whom he names and you can see them and the wider

background to Cult Satanism in my other books starting with *The Biggest Secret*. Cult rituals are interactions with Archontic 'gods'. 'Phillip' described Baron Philippe de Rothschild as 'a master Satanist and hater of God' and he used the same term 'revolt from God' associated with Yaldabaoth/Satan/Lucifer/the Devil in describing the Sabbatian Rothschild dynasty. 'I played a key role in my family's revolt from God', he said. That role was to infiltrate in classic Sabbatian style the Christian Church, but eventually he escaped the mind-prison to live another life. The Cult has been targeting religion in a plan to make worship of the Archons the global one-world religion. Infiltration of Satanism into modern 'culture', especially among the young, through music videos, stage shows and other means, is all part of Nag Hammadi texts describe Yaldabaoth and the Archons in their prime form as energy – consciousness – and say they can take form if they choose in the same way that consciousness takes form as a human. Yaldabaoth is called 'formless' and represents a deeply inverted, distorted and chaotic state of consciousness which seeks to attach to humans and turn them into a likeness of itself in an attempt at assimilation. For that to happen it has to manipulate humans into low frequency mental and emotional states that match its own. Archons can certainly appear in human form and this is the origin of the psychopathic personality. The energetic distortion Gnostics called Yaldabaoth is psychopathy. When psychopathic Archons take human form that human will be a psychopath as an expression of Yaldabaoth consciousness. Cult psychopaths are Archons in human form. The principle is the same as that portrayed in the 2009 *Avatar* movie when the American military travelled to a fictional Earth-like moon called Pandora in the Alpha Centauri star system to infiltrate a society of blue people, or Na'vi, by hiding within bodies that looked like the Na'vi. Archons posing as humans have a particular hybrid information field, part human, part Archon, (the ancient 'demigods') which processes information in a way that manifests behaviour to match their psychopathic evil, lack of empathy and compassion, and stops them being influenced by the empathy, compassion and love that a fully-human information field is capable of expressing. Cult bloodlines interbreed, be they royalty or dark suits, for this reason and you have their obsession with incest. Interbreeding with full-blown

humans would dilute the Archontic energy field that guarantees psychopathy in its representatives in the human realm. Gnostic writings say the main non-human forms that Archons take are serpentine (what I have called for decades 'reptilian' amid unbounded ridicule from the Archontically-programmed) and what Gnostics describe as 'an unborn baby or foetus with grey skin and dark, unmoving eyes'. This is an excellent representation of the ET 'Greys' of UFO folklore which large numbers of people claim to have seen and been abducted by – Zulu shaman Credo Mutwa among them. I agree with those that believe in extraterrestrial or interdimensional visitations today and for thousands of years past. No wonder with their advanced knowledge and technological capability they were perceived and worshipped as gods for technological and other 'miracles' they appeared to perform. Imagine someone arriving in a culture disconnected from the modern world with a smartphone and computer. They would be seen as a 'god' capable of 'miracles'. The Renegade Mind, however, wants to know the source of everything and not only the way that source manifests as human or non-human. In the same way that a Renegade Mind seeks the original source material for the 'Covid virus' to see if what is claimed is true. The original source of Archons in form is consciousness – the distorted state of consciousness known to Gnostics as Yaldabaoth. 'Revolt from God' is energetic disconnection. Where I am going next will make a lot of sense of religious texts and ancient legends relating to 'Satan', Lucifer' and the 'gods'. Gnostic descriptions sync perfectly with the themes of my own research over the years in how they describe a consciousness distortion seeking to impose itself on human consciousness. I've referred to the core of infinite awareness in previous books as Infinite Awareness in Awareness of Itself. By that I mean a level of awareness that knows that it is all awareness and is aware of all awareness. From here comes the frequency of love in its true sense and balance which is what love is on one level – the balance of all forces into a single whole called Oneness and Isness. The more we disconnect from this state of love that many call 'God' the constituent parts of that Oneness start to unravel and express themselves as a part and not a whole. They become individualised as intellect, mind, selfishness, hatred, envy, desire for power over



others, and such like. This is not a problem in the greater scheme in that 'God', the All That Is, can experience all these possibilities through different expressions of itself including humans. What we as expressions of the whole experience the All That Is experiences. We are the All That Is experiencing itself. As we withdraw from that state of Oneness we disconnect from its influence and things can get very unpleasant and very stupid. Archontic consciousness is at the extreme end of that. It has so disconnected from the influence of Oneness that it has become an inversion of unity and love, an inversion of everything, an inversion of life itself. Evil is appropriately live wriġen backwards. Archontic consciousness is obsessed with death, an inversion of life, and so its manifestations in Satanism are obsessed with death. They use inverted symbols in their rituals such as the inverted pentagram and cross. Sabbatians as Archontic consciousness incarnate invert Judaism and every other religion and culture they infiltrate. They seek disunity and chaos and they fear unity and harmony as they fear love like garlic to a vampire. As a result the Cult, Archons incarnate, act with such evil, psychopathy and lack of empathy and compassion disconnected as they are from the source of love. How could Bill Gates and the rest of the Archontic psychopaths do what they have to human society in the 'Covid' era with all the death, suffering and destruction involved and have no emotional consequence for the impact on others? Now you know. Why have Zuckerberg, Brin, Page, Wojcicki and company callously censored information warning about the dangers of the 'vaccine' while thousands have been dying and having severe, sometimes life- changing reactions? Now you know. Why have Tedros, Fauci, Whiġy, Vallance and their like around the world been using case and death figures they're aware are fraudulent to justify lockdowns and all the deaths and destroyed lives that have come from that? Now you know. Why did Christian Drosten produce and promote a 'testing' protocol that he knew couldn't test for infectious disease which led to a global human catastrophe. Now you know. The Archontic mind doesn't give a shit (Fig 17). I personally think that Gates and major Cult insiders are a form of AI cyborg that the Archons want humans to become. Figure 17: Artist Neil Hague's version of the 'Covid' hierarchy. A state of such inversion does have its consequences, however. The level of

disconnection from the Source of All means that you withdraw from that source of energetic sustenance and creativity. This means that you have to find your own supply of energetic power and it has – us. When the Morpheus character in the first Matrix movie held up a bâjery he spoke a profound truth when he said: ‘The Matrix is a computer-generated dream world built to keep us under control in order to change the human being into one of these.’ The statement was true in all respects. We do live in a technologically-generated virtual reality simulation (more very shortly) and we have been manipulated to be an energy source for Archontic consciousness. The Disney-Pixar animated movie Monsters, Inc. in 2001 symbolised the dynamic when monsters in their world had no energy source and they would enter the human world to terrify children in their beds, catch the child’s scream, terror (low-vibrational frequencies), and take that energy back to power the monster world. The lead character you might remember was a single giant eye and the symbolism of the Cult’s all-seeing eye was obvious. Every thought and emotion is broadcast as a frequency unique to that thought and emotion. Feelings of love and joy, empathy and compassion, are high, quick, frequencies while fear, depression, anxiety, suffering and hate are low, slow, dense frequencies. Which kind do you think Archontic consciousness can connect with and absorb? In such a low and dense frequency state there’s no way it can connect with the energy of love and joy. Archons can only feed off energy compatible with their own frequency and they and their Cult agents want to delete the human world of love and joy and manipulate the transmission of low vibrational frequencies through low-vibrational human mental and emotional states. We are their energy source. Wars are energetic banquets to the Archons – a world war even more so – and think how much low-frequency mental and emotional energy has been generated from the consequences for humanity of the ‘Covid’ hoax orchestrated by Archons incarnate like Gates. The ancient practice of human sacrifice ‘to the gods’, continued in secret today by the Cult, is based on the same principle. ‘The gods’ are Archontic consciousness in different forms and the sacrifice is induced into a state of intense terror to generate the energy the Archontic frequency can absorb. Incarnate Archons in the ritual drink the blood which contains an

adrenaline they crave which floods into the bloodstream when people are terrorised. Most of the sacrifices, ancient and modern, are children and the theme of 'sacrificing young virgins to the gods' is just code for children. They have a particular pre-puberty energy that Archons want more than anything and the energy of the young in general is their target. The California Department of Education wants students to chant the names of Aztec gods (Archontic gods) once worshipped in human sacrifice rituals in a curriculum designed to encourage them to 'challenge racist, bigoted, discriminatory, imperialist/colonial beliefs', join 'social movements that struggle for social justice', and 'build new possibilities for a post-racist, post-systemic racism society'. It's the usual Woke crap that inverts racism and calls it anti-racism. In this case solidarity with 'indigenous tribes' is being used as an excuse to chant the names of 'gods' to which people were sacrificed (and still are in secret). What an example of Woke's inability to see beyond black and white, us and them. They condemn the colonisation of these tribal cultures by Europeans (quite right), but those cultures sacrificing people including children to their 'gods', and mass murdering untold numbers as the Aztecs did, is just fine. One chant is to the Aztec god Tezcatlipoca who had a man sacrificed to him in the 5th month of the Aztec calendar. His heart was cut out and he was eaten. Oh, that's okay then. Come on children ... aĜer three ... Other sacrificial 'gods' for the young to chant their allegiance include Quetzalcoatl, Huitzilopochtli and Xipe Totec. The curriculum says that 'chants, affirmations, and energizers can be used to bring the class together, build unity around ethnic studies principles and values, and to reinvigorate the class following a lesson that may be emotionally taxing or even when student engagement may appear to be low'. Well, that's the cover story, anyway. Chanting and mantras are the repetition of a particular frequency generated from the vocal cords and chanting the names of these Archontic 'gods' tunes you into their frequency. That is the last thing you want when it allows for energetic synchronisation, aĵachment and perceptual influence. Initiates chant the names of their 'Gods' in their rituals for this very reason. Vampires of the Woke Paedophilia is another way that Archons absorb the energy of children. Paedophiles possessed by Archontic consciousness are used as the conduit during

sexual abuse for discarnate Archons to vampire the energy of the young they desire so much. Stupendous numbers of children disappear every year never to be seen again although you would never know from the media. Imagine how much low-vibrational energy has been generated by children during the 'Covid' hoax when so many have become depressed and psychologically destroyed to the point of killing themselves. Shocking numbers of children are now taken by the state from loving parents to be handed to others. I can tell you from long experience of researching this since 1996 that many end up with paedophiles and assets of the Cult through corrupt and Cult-owned social services which in the reframing era has hired many psychopaths and emotionless automatons to do the job. Children are even stolen to order using spurious reasons to take them by the corrupt and secret (because they're corrupt) 'family courts'. I have written in detail in other books, starting with *The Biggest Secret* in 1997, about the ubiquitous connections between the political, corporate, government, intelligence and military elites (Cult operatives) and Satanism and paedophilia. If you go deep enough both networks have an interlocking leadership. The Woke mentality has been developed by the Cult for many reasons: To promote almost every aspect of its agenda; to hijack the traditional political left and turn it fascist; to divide and rule; and to target agenda pushbackers. But there are other reasons which relate to what I am describing here. How many happy and joyful Wokers do you ever see especially at the extreme end? They are a mental and psychological mess consumed by emotional stress and constantly emotionally cocked for the next explosion of indignation at someone referring to a female as a female. They are walking, talking, batteries as Morpheus might say emitting frequencies which both enslave them in low-vibrational bubbles of perceptual limitation and feed the Archons. Add to this the hatred claimed to be love; fascism claimed to 'anti-fascism', racism claimed to be 'anti-racism'; exclusion claimed to inclusion; and the abuse-filled Internet trolling. You have a purpose-built Archontic energy system with not a wind turbine in sight and all founded on Archontic inversion. We have whole generations now manipulated to serve the Archons with their unless they snap out of their Archon-induced trance. Is it really a surprise that Cult billionaires and

corporations put so much money their way? Where is the energy of joy and laughter, including laughing at yourself which is confirmation of your own emotional security? Mark Twain said: 'The human race has one really effective weapon, and that is laughter.' We must use it all the time. Woke has destroyed comedy because it has no humour, no joy, sense of irony, or self-deprecation. Its energy is dense and intense. Mmmmm, lunch says the Archontic frequency. Rudolf Steiner (1861-1925) was the Austrian philosopher and famous esoteric thinker who established Waldorf education or Steiner schools to treat children like unique expressions of consciousness and not minds to be programmed with the perceptions determined by authority. I'd been writing about this energy vampiring for decades when I was sent in 2016 a quote by Steiner. He was spot on: There are beings in the spiritual realms for whom anxiety and fear emanating from human beings offer welcome food. When humans have no anxiety and fear, then these creatures starve. If fear and anxiety radiates from people and they break out in panic, then these creatures find welcome nutrition and they become more and more powerful. These beings are hostile towards humanity. Everything that feeds on negative feelings, on anxiety, fear and superstition, despair or doubt, are in reality hostile forces in super-sensible worlds, launching cruel attacks on human beings, while they are being fed ... These are exactly the feelings that belong to contemporary culture and materialism; because it estranges people from the spiritual world, it is especially suited to evoke hopelessness and fear of the unknown in people, thereby calling up the above mentioned hostile forces against them. Pause for a moment from this perspective and reflect on what has happened in the world since the start of 2020. Not only will pennies drop, but billion dollar bills. We see the same theme from Don Juan Matus, a Yaqui Indian shaman in Mexico and the information source for Peruvian-born writer, Carlos Castaneda, who wrote a series of books from the 1960s to 1990s. Don Juan described the force manipulating human society and his name for the Archons was the We have a predator that came from the depths of the cosmos and took over the rule of our lives. Human beings are its prisoners. The predator is our lord and master. It has rendered us docile, helpless. If we want to protest, it

suppresses our protest. If we want to act independently, it demands that we don't do so ... indeed we are held prisoner! They took us over because we are food to them, and they squeeze us mercilessly because we are their sustenance. Just as we rear chickens in coops, the predators rear us in human coops, humaneros. Therefore, their food is always available to them. Different cultures, different eras, same recurring theme. The 'ennoia' dilemma Nag Hammadi Gnostic manuscripts say that Archon consciousness has no 'ennoia'. This is directly translated as 'intentionality', but I'll use the term 'creative imagination'. The All That Is in awareness of itself is the source of all creativity – all possibility – and the more disconnected you are from that source the more you are subsequently denied 'creative imagination'. Given that Archon consciousness is almost entirely disconnected it severely lacks creativity and has to rely on far more mechanical processes of thought and exploit the creative potential of those that do have 'ennoia'. You can see cases of this throughout human society. Archon consciousness almost entirely dominates the global banking system and if we study how that system works you will appreciate what I mean. Banks manifest 'money' out of nothing by issuing lines of 'credit' which is 'money' that has never, does not, and will never exist except in theory. It's a confidence trick. If you think 'credit' figures-on-a-screen 'money' is worth anything you accept it as payment. If you don't then the whole system collapses through lack of confidence in the value of that 'money'. Archontic bankers with no 'ennoia' are 'lending' 'money' that doesn't exist to humans that do have creativity – those that have the inspired ideas and create businesses and products. Archon banking feeds off human creativity which it controls through 'money' creation and debt. Humans have the creativity and Archons exploit that for their own benefit and control while having none themselves. Archon Internet platforms post and while Archontic minds like Zuckerberg may officially head that company it will be human creatives on the staff that provide the creative inspiration. When you have limitless 'money' you can then buy other companies established by creative humans. Witness the acquisition record of Facebook, Google and their like. Survey the Archon-controlled music industry and you see non-creative dark suit executives making their fortune from the human

creativity of their artists. The cases are endless. Research the history of people like Gates and Zuckerberg and how their empires were built on exploiting the creativity of others. Archon minds cannot create out of nothing, but they are skilled (because they have to be) in what Gnostic texts call 'countermimicry'. They can imitate, but not innovate. Sabbatians trawl the creativity of others through backdoors they install in computer systems through their cybersecurity systems. Archon-controlled China is globally infamous for stealing intellectual property and I remember how Hong Kong, now part of China, became notorious for making counterfeit copies of the creativity of others – 'countermimicry'. With the now pervasive and all-seeing surveillance systems able to infiltrate any computer you can appreciate the potential for Archons to vampire the creativity of humans. Author John Lamb Lash wrote in his book about the Nag Hammadi texts, *Not In His Image*: Although they cannot originate anything, because they lack the divine factor of *ennoia* (intentionality), Archons can imitate with a vengeance. Their expertise is simulation (HAL, virtual reality). The Demiurge [Yaldabaoth] fashions a heaven world copied from the fractal patterns [of the original] ... His construction is celestial kitsch, like the fake Italianate villa of a Mafia don complete with militant angels to guard every portal. This brings us to something that I have been speaking about since the turn of the millennium. Our reality is a simulation; a virtual reality that we think is real. No, I'm not kidding. Human reality? Well, virtually I had pondered for years about whether our reality is 'real' or some kind of construct. I remembered being immensely affected on a visit as a small child in the late 1950s to the then newly-opened Planetarium on the Marylebone Road in London which is now closed and part of the adjacent Madame Tussauds wax museum. It was in the middle of the day, but when the lights went out there was the night sky projected in the Planetarium's domed ceiling and it appeared to be so real. The experience never left me and I didn't know why until around the turn of the millennium when I became certain that our 'night sky' and entire reality is a projection, a virtual reality, akin to the illusory world portrayed in the Matrix movies. I looked at the sky one day in this period and it appeared to me like the domed roof of the Planetarium. The release of the first Matrix movie in 1999 also provided a

synchronistic and perfect visual representation of where my mind had been going for a long time. I hadn't come across the Gnostic Nag Hammadi texts then. When I did years later the correlation was once again astounding. As I read Gnostic accounts from 1,600 years and more earlier it was clear that they were describing the same simulation phenomenon. They tell how the Yaldabaoth 'Demiurge' and Archons created a 'bad copy' of original reality to rule over all that were captured by its illusions and the body was a prison to trap consciousness in the 'bad copy' fake reality. Read how Gnostics describe the 'bad copy' and update that to current times and they are referring to what we would call today a virtual reality simulation. Author John Lamb Lash said 'the Demiurge fashions a heaven world copied from the fractal paĵerns' of the original through expertise in 'HAL' or virtual reality simulation. Fractal paĵerns are part of the energetic information construct of our reality, a sort of blueprint. If these paĵerns were copied in computer terms it would indeed give you a copy of a 'natural' reality in a non-natural frequency and digital form. The principle is the same as making a copy of a website. The original website still exists, but now you can change the copy version to make it whatever you like and it can become very different to the original website. Archons have done this with our reality, a synthetic copy of prime reality that still exists beyond the frequency walls of the simulation. Trapped within the illusions of this synthetic Matrix, however, were and are human consciousness and other expressions of prime reality and this is why the Archons via the Cult are seeking to make the human body synthetic and give us synthetic AI minds to complete the job of turning the entire reality synthetic including what we perceive to be the natural world. To quote Kurzweil: 'Nanobots will infuse all the maĵer around us with information. Rocks, trees, everything will become these intelligent creatures.' Yes, synthetic 'creatures' just as 'Covid' and other genetically-manipulating 'vaccines' are designed to make the human body synthetic. From this perspective it is obvious why Archons and their Cult are so desperate to infuse synthetic material into every human with their 'Covid' scam. Let there be (electromagnetic) light Yaldabaoth, the force that created the simulation, or Matrix, makes sense of the Gnostic reference to 'The Great Architect' and its use by Cult Freemasonry as the



name of its deity. The designer of the Matrix in the movies is called 'The Architect' and that trilogy is jam-packed with symbolism relating to these subjects. I have contended for years that the angry Old Testament God (Yaldabaoth) is the 'God' being symbolically 'quoted' in the opening of Genesis as 'creating the world'. This is not the creation of prime reality – it's the creation of the simulation. The Genesis 'God' says: 'Let there be Light: and there was light.' But what is this 'Light'? I have said for decades that the speed of light (186,000 miles per second) is not the fastest speed possible as claimed by mainstream science and is in fact the frequency walls or outer limits of the Matrix. You can't have a fastest or slowest anything within all possibility when everything is possible. The human body is encoded to operate within the speed of light or within the simulation and thus we see only the tiny frequency band of visible light. Near-death experiencers who perceive reality outside the body during temporary 'death' describe a very different form of light and this is supported by the Nag Hammadi texts. Prime reality beyond the simulation ('Upper Aeons' to the Gnostics) is described as a realm of incredible beauty, bliss, love and harmony – a realm of 'watery light' that is so powerful 'there are no shadows'. Our false reality of Archon control, which Gnostics call the 'Lower Aeons', is depicted as a realm with a different kind of 'light' and described in terms of chaos, 'Hell', 'the Abyss' and 'Outer Darkness', where trapped souls are tormented and manipulated by demons (relate that to the 'Covid' hoax alone). The watery light theme can be found in near-death accounts and it is not the same as simulation 'light' which is electromagnetic or radiation light within the speed of light – the 'Lower Aeons'. Simulation 'light' is the 'luminous fire' associated by Gnostics with the Archons. The Bible refers to Yaldabaoth as 'that old serpent, called the Devil, and Satan, which deceiveth the whole world' (Revelation 12:9). I think that making a simulated copy of prime reality ('countermimicry') and changing it dramatically while all the time manipulating humanity to believe it to be real could probably meet the criteria of deceiving the whole world. Then we come to the Cult god Lucifer – the Light Bringer. Lucifer is symbolic of Yaldabaoth, the bringer of radiation light that forms the bad copy simulation within the speed of light. 'He' is symbolised by the lighted torch held by the Statue of Liberty

and in the name 'Illuminati'. Sabbatian-Frankism declares that Lucifer is the true god and Lucifer is the real god of Freemasonry honoured as their 'Great or Grand Architect of the Universe' (simulation). I would emphasise, too, the way Archontic technologically- generated luminous fire of radiation has deluged our environment since I was a kid in the 1950s and changed the nature of The Field with which we constantly interact. Through that interaction technological radiation is changing us. The Smart Grid is designed to operate with immense levels of communication power with 5G expanding across the world and 6G, 7G, in the process of development. Radiation is the simulation and the Archontic manipulation system. Why wouldn't the Archon Cult wish to unleash radiation upon us to an ever-greater extreme to form Kurzweil's 'cloud'? The plan for a synthetic human is related to the need to cope with levels of radiation beyond even anything we've seen so far. Biological humans would not survive the scale of radiation they have in their script. The Smart Grid is a technological sub-reality within the technological simulation to further disconnect five-sense perception from expanded consciousness. It's a technological prison of the mind. Infusing the 'spirit of darkness' A recurring theme in religion and native cultures is the manipulation of human genetics by a non-human force and most famously recorded as the biblical 'sons of god' (the gods plural in the original) who interbred with the daughters of men. The Nag Hammadi Apocryphon of John tells the same story this way: He [Yaldabaoth] sent his angels [Archons/demons] to the daughters of men, that they might take some of them for themselves and raise offspring for their enjoyment. And at first they did not succeed. When they had no success, they gathered together again and they made a plan together ... And the angels changed themselves in their likeness into the likeness of their mates, filling them with the spirit of darkness, which they had mixed for them, and with evil ... And they took women and begot children out of the darkness according to the likeness of Possession when a discarnate entity takes over a human body is an age-old theme and continues today. It's very real and I've seen it. Satanic and secret society rituals can create an energetic environment in which entities can aŕach to initiates and I've heard many stories of how people have changed

their personality after being initiated even into lower levels of the Freemasons. I have been inside three Freemasonic temples, one at a public open day and two by just walking in when there was no one around to stop me. They were in Ryde, the town where I live, Birmingham, England, when I was with a group, and Boston, Massachusetts. They all felt the same energetically – dark, dense, low-vibrational and sinister. Demonic attachment can happen while the initiate has no idea what is going on. To them it's just a ritual to get in the Masons and do a bit of good business. In the far more extreme rituals of Satanism human possession is even more powerful and they are designed to make possession possible. The hierarchy of the Cult is dictated by the power and perceived status of the possessing Archon. In this way the Archon hierarchy becomes the Cult hierarchy. Once the entity has attached it can influence perception and behaviour and if it attaches to the extreme then so much of its energy (information) infuses into the body information field that the hologram starts to reflect the nature of the possessing entity. This is the Exorcist movie type of possession when facial features change and it's known as shapeshifting. Islam's Jinn are said to be invisible tricksters who change shape, 'whisper', confuse and take human form. These are all traits of the Archons and other versions of the same phenomenon. Extreme possession could certainly infuse the 'spirit of darkness' into a partner during sex as the Nag Hammadi texts appear to describe. Such an infusion can change genetics which is also energetic information. Human genetics is information and the 'spirit of darkness' is information. Mix one with the other and change must happen. Islam has the concept of a 'Jinn baby' through possession of the mother and by Jinn taking human form. There are many ways that human genetics can be changed and remember that Archons have been aware all along of advanced techniques to do this. What is being done in human society today – and far more – was known about by Archons at the time of the 'fallen ones' and their other versions described in religions and cultures. Archons and their human-world Cult are obsessed with genetics as we see today and they know this dictates how information is processed into perceived reality during a human life. They needed to produce a human form that would decode the simulation and this is symbolically known as

'Adam and Eve' who left the 'garden' (prime reality) and 'fell' into Matrix reality. The simulation is not a 'physical' construct (there is no 'physical'); it is a source of information. Think Wi-Fi again. The simulation is an energetic field encoded with information and body-brain systems are designed to decode that information encoded in wave or frequency form which is transmitted to the brain as electrical signals. These are decoded by the brain to construct our sense of reality – an illusory 'physical' world that only exists in the brain or the mind. Virtual reality games mimic this process using the same sensory decoding system. Information is fed to the senses to decode a virtual reality that can appear so real, but isn't (Figs 18 and 19). Some scientists believe – and I agree with them – that what we perceive as 'physical' reality only exists when we are looking or observing. The act of perception or focus triggers the decoding systems which turn waveform information into holographic reality. When we are not observing something our reality reverts from a holographic state to a waveform state. This relates to the same principle as a falling tree not making a noise unless someone is there to hear it or decode it. The concept makes sense from the simulation perspective. A computer is not decoding all the information in a Wi-Fi field all the time and only decodes or brings into reality on the screen that part of Wi-Fi that it's decoding – focusing upon – at that moment. Figure 18: Virtual reality technology 'hacks' into the body's five-sense decoding system. Figure 19: The result can be experienced as very 'real'. Interestingly, Professor Donald Hoffman at the Department of Cognitive Sciences at the University of California, Irvine, says that our experienced reality is like a computer interface that shows us only the level with which we interact while hiding all that exists beyond it: 'Evolution shaped us with a user interface that hides the truth. Nothing that we see is the truth – the very language of space and time and objects is the wrong language to describe reality.' He is correct in what he says on so many levels. Space and time are not a universal reality. They are a phenomenon of decoded simulation reality as part of the process of enslaving our sense of reality. Near-death experiencers report again and again how space and time did not exist as we perceive them once they were free of the body – body decoding systems. You can appreciate from this why

Archons and their Cult are so desperate to entrap human attention in the five senses where we are in the Matrix and of the Matrix. Opening your mind to expanded states of awareness takes you beyond the information confines of the simulation and you become aware of knowledge and insights denied to you before. This is what we call 'awakening' – awakening from the Matrix – and in the final chapter I will relate this to current events. Where are the 'aliens'? A simulation would explain the so-called 'Fermi Paradox' named after Italian physicist Enrico Fermi (1901-1954) who created the first nuclear reactor. He considered the question of why there is such a lack of extraterrestrial activity when there are so many stars and planets in an apparently vast universe; but what if the night sky that we see, or think we do, is a simulated projection as I say? If you control the simulation and your aim is to hold humanity fast in essential ignorance would you want other forms of life including advanced life coming and going sharing information with humanity? Or would you want them to believe they were isolated and apparently alone? Themes of human isolation and apartness are common whether they be the perception of a lifeless universe or the fascist isolation laws of the 'Covid' era. Paradoxically the very existence of a simulation means that we are not alone when some force had to construct it. My view is that experiences that people have reported all over the world for centuries with Reptilians and Grey entities are Archon phenomena as Nag Hammadi texts describe; and that benevolent 'alien' interactions are non-human groups that come in and out of the simulation by overcoming Archon attempts to keep them out. It should be highlighted, too, that Reptilians and Greys are obsessed with genetics and technology as related by cultural accounts and those who say they have been abducted by them. Technology is their way of overcoming some of the limitations in their creative potential and our technology-driven and controlled human society of today is archetypal Archon-Reptilian-Grey modus operandi. Technocracy is really Archontocracy. The Universe does not have to be as big as it appears with a simulation. There is no space or distance only information decoded into holographic reality. What we call 'space' is only the absence of holographic 'objects' and that 'space' is The Field of energetic information which connects

everything into a single whole. The same applies with the artificially-generated information field of the simulation. The Universe is not big or small as a physical reality. It is decoded information, that's all, and its perceived size is decided by the way the simulation is encoded to make it appear. The entire night sky as we perceive it only exists in our brain and so where are those 'millions of light years'? The 'stars' on the ceiling of the Planetarium looked a vast distance away. There's another point to mention about 'aliens'. I have been highlighting since the 1990s the plan to stage a fake 'alien invasion' to justify the centralisation of global power and a world military. Nazi scientist Werner von Braun, who was taken to America by Operation Paperclip after World War Two to help found NASA, told his American assistant Dr Carol Rosin about the Cult agenda when he knew he was dying in 1977. Rosin said that he told her about a sequence that would lead to total human control by a one-world government. This included threats from terrorism, rogue nations, meteors and asteroids before finally an 'alien invasion'. All of these things, von Braun said, would be bogus and what I would refer to as a No-Problem-Reaction-Solution. Keep this in mind when 'the aliens are coming' is the new mantra. The aliens are not coming – they are already here and they have infiltrated human society while looking human. French-Canadian investigative journalist Serge Monast said in 1994 that he had uncovered a NASA/military operation called Project Blue Beam which fits with what Werner von Braun predicted. Monast died of a 'heart attack' in 1996 the day after he was arrested and spent a night in prison. He was 51. He said Blue Beam was a plan to stage an alien invasion that would include religious figures beamed holographically into the sky as part of a global manipulation to usher in a 'new age' of worshipping what I would say is the Cult 'god' Yaldabaoth in a one-world religion. Fake holographic asteroids are also said to be part of the plan which again syncs with von Braun. How could you stage an illusory threat from asteroids unless they were holographic inserts? This is pretty straightforward given the advanced technology outside the public arena and the fact that our 'physical' reality is holographic anyway. Information fields would be projected and we would decode them into the illusion of a 'physical' asteroid. If they can sell a global 'pandemic' with a 'virus' that doesn't

exist what will humans not believe if government and media tell them? All this is particularly relevant as I write with the Pentagon planning to release in June, 2021, information about 'UFO sightings'. I have been following the UFO story since the early 1990s and the common theme throughout has been government and military denials and cover up. More recently, however, the Pentagon has suddenly become more talkative and apparently open with Air Force pilot radar images released of unexplained craft moving and changing direction at speeds well beyond anything believed possible with human technology. Then, in March, 2021, former Director of National Intelligence John Ratcliffe said a Pentagon report months later in June would reveal a great deal of information about UFO sightings unknown to the public. He said the report would have 'massive implications'. The order to do this was included bizarrely in a \$2.3 trillion 'coronavirus' relief and government funding bill passed by the Trump administration at the end of 2020. I would add some serious notes of caution here. I have been pointing out since the 1990s that the US military and intelligence networks have long had craft – 'flying saucers' or anti-gravity craft – which any observer would take to be extraterrestrial in origin. Keeping this knowledge from the public allows craft flown by humans to be perceived as alien visitations. I am not saying that 'aliens' do not exist. I would be the last one to say that, but we have to be streetwise here. President Ronald Reagan told the UN General Assembly in 1987: 'I occasionally think how quickly our differences worldwide would vanish if we were facing an alien threat from outside this world.' That's the idea. Unite against a common 'enemy' with a common purpose behind your 'saviour force' (the Cult) as this age-old technique of mass manipulation goes global. Science moves this way ... I could find only one other person who was discussing the simulation hypothesis publicly when I concluded it was real. This was Nick Bostrom, a Swedish-born philosopher at the University of Oxford, who has explored for many years the possibility that human reality is a computer simulation although his version and mine are not the same. Today the simulation and holographic reality hypothesis have increasingly entered the scientific mainstream. Well, the more open-minded mainstream, that is. Here are a few of the ever-gathering examples.

American nuclear physicist Silas Beane led a team of physicists at the University of Bonn in Germany pursuing the question of whether we live in a simulation. They concluded that we probably do and it was likely based on a lattice of cubes. They found that cosmic rays align with that specific pattern. The team highlighted the Greisen–Zatsepin–Kuzmin (GZK) limit which refers to cosmic ray particle interaction with cosmic background radiation that creates an apparent boundary for cosmic ray particles. They say in a paper entitled 'Constraints on the Universe as a Numerical Simulation' that this 'pattern of constraint' is exactly what you would find with a computer simulation. They also made the point that a simulation would create its own 'laws of physics' that would limit possibility. I've been making the same point for decades that the perceived laws of physics relate only to this reality, or what I would later call the simulation. When designers write codes to create computer and virtual reality games they are the equivalent of the laws of physics for that game. Players interact within the limitations laid out by the coding. In the same way those who wrote the codes for the simulation decided the laws of physics that would apply. These can be overridden by expanded states of consciousness, but not by those enslaved in only five-sense awareness where simulation codes rule. Overriding the codes is what people call 'miracles'. They are not. They are bypassing the encoded limits of the simulation. A population caught in simulation perception would have no idea that this was their plight. As the Bonn paper said: 'Like a prisoner in a pitch-black cell we would not be able to see the "walls" of our prison,' That's true if people remain mesmerised by the five senses. Open to expanded awareness and those walls become very clear. The main one is the speed of light. American theoretical physicist James Gates is another who has explored the simulation question and found considerable evidence to support the idea. Gates was Professor of Physics at the University of Maryland, Director of The Center for String and Particle Theory, and on Barack Obama's Council of Advisors on Science and Technology. He and his team found computer codes of digital data embedded in the fabric of our reality. They relate to on-off electrical charges of 1 and 0 in the binary system used by computers. 'We have the energetic fabric mathematical sequences known as error-



correcting codes or block codes that 'reboot' data to its original state or 'default settings' when something knocks it out of sync. Gates was asked if he had found a set of equations embedded in our reality indistinguishable from those that drive search engines and browsers and he said: 'That is correct.' Rich Terrile, director of the Centre for Evolutionary Computation and Automated Design at NASA's Jet Propulsion Laboratory, has said publicly that he believes the Universe is a digital hologram that must have been created by a form of intelligence. I agree with that in every way. Waveform information is delivered electrically by the senses to the brain which constructs a digital holographic reality that we call the 'world'. This digital level of reality can be read by the esoteric art of numerology. Digital holograms are at the cutting edge of holographics today. We have digital technology everywhere designed to access and manipulate our digital level of perceived reality. Synthetic mRNA in 'Covid vaccines' has a digital component to manipulate the body's digital Reality is numbers How many know that our reality can be broken down to numbers and codes that are the same as computer games? Max Tegmark, a physicist at the Massachusetts Institute of Technology (MIT), is the author of Our Mathematical Universe in which he lays out how reality can be entirely described by numbers and maths in the way that a video game is encoded with the 'physics' of computer games. Our world and computer virtual reality are essentially the same. Tegmark imagines the perceptions of characters in an advanced computer game when the graphics are so good they don't know they are in a game. They think they can bump into real objects (electromagnetic resistance in our reality), fall in love and feel emotions like excitement. When they began to study the apparently 'physical world' of the video game they would realise that everything was made of pixels (which have been found in our energetic reality as must be the case when on one level our world is digital). What computer game characters thought was physical 'stuff', Tegmark said, could actually be broken down into numbers: And we're exactly in this situation in our world. We look around and it doesn't seem that mathematical at all, but everything we see is made out of elementary particles like quarks and electrons. And what properties does an electron have? Does it have a smell or a colour or a texture? No! ... We physicists have come

up with geeky names for [Electron] properties, like electric charge, or spin, or lepton number, but the electron doesn't care what we call it, the properties are just numbers. This is the illusory reality Gnostics were describing. This is the simulation. The A, C, G, and T codes of DNA have a binary value – A and C = 0 while G and T = 1. This has to be when the simulation is digital and the body must be digital to interact with it. Recurring mathematical sequences are encoded throughout reality and the body. They include the Fibonacci sequence in which the two previous numbers are added to get the next one, as in ... 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, etc. The sequence is encoded in the human face and body, proportions of animals, DNA, seed heads, pine cones, trees, shells, spiral galaxies, hurricanes and the number of petals in a flower. The list goes on and on. There are fractal patterns – a 'never- ending pattern that is infinitely complex and self-similar across all scales in the as above, so below, principle of holograms. These and other famous recurring geometrical and mathematical sequences such as Phi, Pi, Golden Mean, Golden Ratio and Golden Section are computer codes of the simulation. I had to laugh and give my head a shake the day I finished this book and it went into the production stage. I was sent an article in Scientific American published in April, 2021, with the headline 'Confirmed! We Live in a Simulation'. Two decades after I first said our reality is a simulation and the speed of light is its outer limit the article suggested that we do live in a simulation and that the speed of light is its outer limit. I left school at 15 and never passed a major exam in my life while the writer was up to his eyes in qualifications. As I will explain in the final chapter knowing is far better than thinking and they come from very different sources. The article rightly connected the speed of light to the processing speed of the 'Matrix' and said what has been in my books all this time ... 'If we are in a simulation, as it appears, then space is an abstract property written in code. It is not real'. No it's not and if we live in a simulation something created it and it wasn't us. 'That David Icke says we are manipulated by aliens' – he's crackers.' The reality that humanity thinks is so real is an illusion. Politicians, governments, scientists, doctors, academics, law enforcement, media, school and university curriculums, on and on, are all founded on a world that does not exist except as a simulated

prison cell. Is it such a stretch to accept that 'Covid' doesn't exist when our entire 'physical' reality doesn't exist? Revealed here is the knowledge kept under raps in the Cult networks of compartmentalised secrecy to control humanity's sense of reality by inducing the population to believe in a reality that's not real. If it wasn't so tragic in its experiential consequences the whole thing would be hysterically funny. None of this is new to Renegade Minds. Ancient Greek philosopher Plato (about 428 to about 347BC) was a major influence on Gnostic belief and he described the human plight thousands of years ago with his Allegory of the Cave. He told the symbolic story of prisoners living in a cave who had never been outside. They were chained and could only see one wall of the cave while behind them was a fire that they could not see. Figures walked past the fire casting shadows on the prisoners' wall and those moving shadows became their sense of reality. Some prisoners began to study the shadows and were considered experts on them (today's academics and scientists), but what they studied was only an illusion (today's academics and scientists). A prisoner escaped from the cave and saw reality as it really is. When he returned to report this revelation they didn't believe him, called him mad and threatened to kill him if he tried to set them free. Plato's tale is not only a brilliant analogy of the human plight and our illusory reality. It describes, too, the dynamics of the 'Covid' hoax. I have only skimmed the surface of these subjects here. The aim of this book is to crisply connect all essential dots to put what is happening today into its true context. All subject areas and their connections in this chapter are covered in great evidential detail in Everything You Need To Know, But Have Never Been Told and The Answer. They say that bewildered people 'can't see the forest for the trees'. Humanity, however, can't see the forest for the twigs. The five senses see only twigs while Renegade Minds can see the forest and it's the forest where the answers lie with the connections that reveals. Breaking free of perceptual programming so the forest can be seen is the way we turn all this around. Not breaking free is how humanity got into this mess. The situation may seem hopeless, but I promise you it's not. We are a perceptual heartbeat from paradise if only we Life is simply a vacation from the infinite enegade Minds weave the web of life and events and see common themes in the

apparently random. They are always there if you look for them and their pursuit is aided by incredible synchronicity that comes when your mind is open rather than mesmerised by what it thinks it can see. Infinite awareness is infinite possibility and the more of infinite possibility that we access the more becomes infinitely possible. That may be stating the apparently obvious, but it is a devastatingly- powerful fact that can set us free. We are a point of attention within an infinity of consciousness. The question is how much of that infinity do we choose to access? How much knowledge, insight, awareness, wisdom, do we want to connect with and explore? If your focus is only in the five senses you will be influenced by a fraction of infinite awareness. I mean a range so tiny that it gives new meaning to infinitesimal. Limitation of self-identity and a sense of the possible limit accordingly your range of consciousness. We are what we think we are. Life is what we think it is. The dream is the dreamer and the dreamer is the dream. Buddhist philosophy puts it this way: 'As a thing is viewed, so it appears.' Most humans live in the realm of touch, taste, see, hear, and smell and that's the limit of their sense of the possible and sense of self. Many will follow a religion and speak of a God in his heaven, but their lives are still dominated by the five senses in their perceptions and actions. The five senses become the arbiter of everything. When that happens all except a smear of infinity is sealed away from influence by the rigid, unyielding, reality bubbles that are the five-sense human or Phantom Self. Archon Cult methodology is to isolate consciousness within five-sense reality – the simulation – and then program that consciousness with a sense of self and the world through a deluge of life-long information designed to instil the desired perception that allows global control. Efforts to do this have increased dramatically with identity politics as identity bubbles are squeezed into the minutiae of five-sense detail which disconnect people even more profoundly from the infinite 'I'. Five-sense focus and self-identity are like a firewall that limits access to the infinite realms. You only perceive one radio or television station and no other. We'll take that literally for a moment. Imagine a vast array of stations giving different information and angles on reality, but you only ever listen to one. Here we have the human plight in which the population is overwhelmingly confined to CultFM.

This relates only to the frequency range of CultFM and limits perception and insight to that band – limits possibility to that band. It means you are connecting with an almost imperceptibly minuscule range of possibility and creative potential within the infinite Field. It's a world where everything seems apart from everything else and where synchronicity is rare. Synchronicity is defined in the dictionary as 'the happening by chance of two or more related or similar events at the same time'. Use of 'by chance' betrays a complete misunderstanding of reality. Synchronicity is not 'by chance'. As people open their minds, or 'awaken' to use the term, they notice more and more coincidences in their lives, bits of 'luck', apparently miraculous happenings that put them in the right place at the right time with the right people. Days become peppered with 'fancy meeting you here' and 'what are the chances of that?' My entire life has been lived like this and ever more so since my own colossal awakening in 1990 and 91 which transformed my sense of reality. Synchronicity is not 'by chance'; it is by accessing expanded realms of possibility which allow expanded potential for manifestation. People broadcasting the same vibe from the same openness of mind tend to be drawn 'by chance' to each other through what I call frequency magnetism and it's not only people. In the last more than 30 years incredible synchronicity has also led me through the Cult maze to information in so many forms and to crucial personal experiences. These 'coincidences' have allowed me to put the puzzle pieces together across an enormous array of subjects and situations. Those who have breached the bubble of five- sense reality will know exactly what I mean and this escape from the perceptual prison cell is open to everyone whenever they make that choice. This may appear super-human when compared with the limitations of 'human', but it's really our natural state. 'Human' as currently experienced is consciousness in an unnatural state of induced separation from the infinity of the whole. I'll come to how this transformation into unity can be made when I have described in more detail the force that holds humanity in servitude by denying this access to infinite self. The Wetiko factor I have been talking and writing for decades about the way five-sense mind is systematically barricaded from expanded awareness. I have used the analogy of a computer (five-sense

mind) and someone at the keyboard (expanded awareness). Interaction between the computer and the operator is symbolic of the interaction between five-sense mind and expanded awareness. The computer directly experiences the Internet and the operator experiences the Internet via the computer which is how it's supposed to be – the two working as one. Archons seek to control that point where the operator connects with the computer to stop that interaction (Fig 20). Now the operator is banging the keyboard and clicking the mouse, but the computer is not responding and this happens when the computer is taken over – possessed – by an appropriately-named computer 'virus'. The operator has lost all influence over the computer which goes its own way making decisions under the control of the 'virus'. I have just described the dynamic through which the force known to Gnostics as Yaldabaoth and Archons disconnects five-sense mind from expanded awareness to imprison humanity in perceptual Figure 20: The mind 'virus' I have been writing about for decades seeks to isolate five-sense mind (the computer) from the true 'I'. (Image by Neil Hague). About a year ago I came across a Native American concept of Wetiko which describes precisely the same phenomenon. Wetiko is the spelling used by the Cree and there are other versions including wintiko and windigo used by other tribal groups. They spell the name with lower case, but I see Wetiko as a proper noun as with Archons and prefer a capital. I first saw an article about Wetiko by writer and researcher Paul Levy which so synced with what I had been writing about the computer/operator disconnection and later the Archons. I then read his book, the fascinating *Dispelling Wetiko, Breaking the Spell of Evil*. The parallels between what I had concluded long before and the Native American concept of Wetiko were so clear and obvious that it was almost funny. For Wetiko see the Gnostic Archons for sure and the Jinn, the Predators, and every other name for a force of evil, inversion and chaos. Wetiko is the Native American name for the force that divides the computer from the operator (Fig 21). Indigenous author Jack D. Forbes, a founder of the Native American movement in the 1960s, wrote another book about Wetiko entitled *Columbus And Other Cannibals – The Wetiko Disease of Exploitation, Imperialism, and Terrorism* which I also read. Forbes says that Wetiko refers to

an evil person or spirit 'who terrorizes other creatures by means of terrible acts, including cannibalism'. Zulu shaman Credo Mutwa told me that African accounts tell how cannibalism was brought into the world by the Chitauri 'gods' – another manifestation of Wetiko. The distinction between 'evil person or spirit' relates to Archons/Wetiko possessing a human or acting as pure consciousness. Wetiko is said to be a sickness of the soul or spirit and a state of being that takes but gives nothing back – the Cult and its operatives perfectly described. Black Hawk, a Native American war leader defending their lands from confiscation, said European invaders had 'poisoned hearts' – Wetiko hearts – and that this would spread to native societies. Mention of the heart is very significant as we shall shortly see. Forbes writes: 'Tragically, the history of the world for the past 2,000 years is, in great part, the story of the epidemiology of the wetiko disease.' Yes, and much longer. Forbes is correct when he says: 'The wetikos destroyed Egypt and Babylon and Athens and Rome and Tenochtitlan [capital of the Aztec empire] and perhaps now they will destroy the entire earth.' Evil, he said, is the number one export of a Wetiko culture – see its globalisation with 'Covid'. Constant war, mass murder, suffering of all kinds, child abuse, Satanism, torture and human sacrifice are all expressions of Wetiko and the Wetiko possessed. The world is Wetiko made manifest, but it doesn't have to be. There is a way out of this even now. Figure 21: The mind 'virus' is known to Native Americans as 'Wetiko'. (Image by Neil Hague). Cult of Wetiko Wetiko is the Yaldabaoth frequency distortion that seeks to aĵach to human consciousness and absorb it into its own. Once this connection is made Wetiko can drive the perceptions of the target which they believe to be coming from their own mind. All the horrors of history and today from mass killers to Satanists, paedophiles like Jeffrey Epstein and other psychopaths, are the embodiment of Wetiko and express its state of being in all its grotesqueness. The Cult is Wetiko incarnate, Yaldabaoth incarnate, and it seeks to facilitate Wetiko assimilation of humanity in totality into its distortion by manipulating the population into low frequency states that match its own. Paul Levy writes: 'Holographically enforced within the psyche of every human being the wetiko virus pervades and underlies the entire field of consciousness,

and can therefore potentially manifest through any one of us at any moment if we are not mindful.' The 'Covid' hoax has achieved this with many people, but others have not fallen into Wetiko's frequency lair. Players in the 'Covid' human catastrophe including Gates, Schwab, Tedros, Fauci, Whitty, Vallance, Johnson, Hancock, Ferguson, Drosten, and all the rest, including the psychopath psychologists, are expressions of Wetiko. This is why they have no compassion or empathy and no emotional consequence the people who support the psychopaths in authority against the Pushbackers despite the damaging impact the psychopaths have on their own lives and their family's lives. You are again looking at Wetiko possession which prevents them seeing through the lies to the obvious scam going on. Why can't they see it? Wetiko won't let them see it. The perceptual divide that has now become a chasm is between the Wetikoed and the non-Wetikoed. Paul Levy describes Wetiko in the same way that I have long described the Archontic force. They are the same distorted consciousness operating across dimensions of reality: '... the subtle body of wetiko is not located in the third dimension of space and time, literally existing in another dimension ... it is able to affect ordinary lives by mysteriously interpenetrating into our three- dimensional world.' Wetiko does this through its incarnate representatives in the Cult and by weaving itself into The Field which on our level of reality is the electromagnetic information field of the simulation or Matrix. More than that, the simulation is Wetiko / Yaldabaoth. Caleb Scharf, Director of Astrobiology at Columbia University, has speculated that 'alien life' could be so advanced that it has transcribed itself into the quantum realm to become what we call physics. He said intelligence indistinguishable from the fabric of the Universe would solve many of its greatest mysteries: Perhaps hyper-advanced life isn't just external. Perhaps it's already all around. It is embedded in what we perceive to be physics itself, from the root behaviour of particles and fields to the phenomena of complexity and emergence ... In other words, life might not just be in the equations. It might BE the equations [My emphasis]. Scharf said it is possible that 'we don't recognise advanced life because it forms an integral and unsuspecting part of what we've considered to be the natural world'. I agree. Wetiko/Yaldabaoth is the simulation. We are



literally in the body of the beast. But that doesn't mean it has to control us. We all have the power to overcome Wetiko influence and the Cult knows that. I doubt it sleeps too well because it knows that. This, I suggest, is how it all works. There are two Fields. One is the fierce electromagnetic light of the Matrix within the speed of light; the other is the 'watery light' of The Field beyond the walls of the Matrix that connects with the Great Infinity. Five-sense mind and the decoding systems of the body â€ˆach us to the Field of Matrix light. They have to or we could not experience this reality. Five-sense mind sees only the Matrix Field of information while our expanded consciousness is part of the Infinity Field. When we open our minds, and most importantly our hearts, to the Infinity Field we have a mission control which gives us an expanded perspective, a road map, to understand the nature of the five-sense world. If we are isolated only in five-sense mind there is no mission control. We're on our own trying to understand a world that's constantly feeding us information to ensure we do not understand. People in this state can feel 'lost' and bewildered with no direction or radar. You can see ever more clearly those who are influenced by the Fields of Big Infinity or liŕle five-sense mind simply by their views and behaviour with regard to the 'Covid' hoax. We have had this division throughout known human history with the mass of the people on one side and individuals who could see and intuit beyond the walls of the simulation – Plato's prisoner who broke out of the cave and saw reality for what it is. Such people have always been targeted by Wetiko/Archon-possessed authority, burned at the stake or demonised as mad, bad and dangerous. The Cult today and its global network of 'anti-hate', 'anti-fascist' Woke groups are all expressions of Wetiko â€ˆacking those exposing the conspiracy, 'Covid' lies and the 'vaccine' agenda. Woke as a whole is Wetiko which explains its black and white mentality and how at one it is with the Wetiko-possessed Cult. Paul Levy said: 'To be in this paradigm is to still be under the thrall of a two-valued logic – where things are either true or false – of a wetikoized mind.' Wetiko consciousness is in a permanent rage, therefore so is Woke, and then there is Woke inversion and contradiction. 'Anti-fascists' act like fascists because fascists and 'anti- fascists' are both Wetiko at work. Political parties act the same while

claiming to be different for the same reason. Secret society and satanic rituals are aŕaching initiates to Wetiko and the cold, ruthless, psychopathic mentality that secures the positions of power all over the world is Wetiko. Reframing 'training programmes' have the same cumulative effect of aŕaching Wetiko and we have their graduates described as automatons and robots with a cold, psychopathic, uncaring demeanour. They are all traits of Wetiko possession and look how many times they have been described in this book and elsewhere with regard to personnel behind 'Covid' including the police and medical profession. Climbing the greasy pole in any profession in a Wetiko society requires traits of Wetiko to get there and that is particularly true of politics which is not about fair competition and pre-eminence of ideas. It is founded on how many backs you can stab and arses you can lick. This culminated in the global 'Covid' coordination between the Wetiko possessed who pulled it off in all the different countries without a trace of empathy and compassion for their impact on humans. Our sight sense can see only holographic form and not the Field which connects holographic form. Therefore we perceive 'physical' objects with 'space' in between. In fact that 'space' is energy/consciousness operating on multiple frequencies. One of them is Wetiko and that connects the Cult psychopaths, those who submit to the psychopaths, and those who serve the psychopaths in the media operations of the world. Wetiko is Gates. Wetiko is the mask-wearing submissive. Wetiko is the fake journalist and 'fact-checker'. The Wetiko Field is coordinating the whole thing. Psychopaths, gofers, media operatives, 'anti-hate' hate groups, 'fact-checkers' and submissive people work as one unit even without human coordination because they are aŕached to the same Field which is organising it all (Fig 22). Paul Levy is here describing how Wetiko-possessed people are drawn together and refuse to let any information breach their rigid perceptions. He was writing long before 'Covid', but I think you will recognise followers of the 'Covid' religion oh just a little bit: People who are channelling the vibratory frequency of wetiko align with each other through psychic resonance to reinforce their unspoken shared agreement so as to uphold their deranged view of reality. Once an unconscious content takes possession of certain individuals, it irresistibly draws them

together by mutual attraction and knits them into groups tied together by their shared madness that can easily swell into an avalanche of insanity. A psychic epidemic is a closed system, which is to say that it is insular and not open to any new information or informing influences from the outside world which contradict its fixed, limited, and limiting perspective. There we have the Woke mind and the 'Covid' mind. Compatible resonance draws the awakening together, too, which is clearly Figure 22: The Wetiko Field from which the Cult pyramid and its personnel are made manifest. (Image by Neil Hague). Wetiko doesn't care about humans. It's not human; it just possesses humans for its own ends and the effect (depending on the scale of possession) can be anything from extreme psychopathy to unquestioning obedience. Wetiko's worst nightmare is for human consciousness to expand beyond the simulation. Everything is focussed on stopping that happening through control of information, thus perception, thus frequency. The 'education system', media, science, medicine, academia, are all geared to maintaining humanity in five-sense servitude as is the constant stimulation of low-vibrational mental and emotional states (see 'Covid'). Wetiko seeks to dominate those subconscious spaces between five-sense perception and expanded consciousness where the computer meets the operator. From these subconscious hiding places Wetiko speaks to us to trigger urges and desires that we take to be our own and manipulate us into anything from low-vibrational to psychopathic states. Remember how Islam describes the Jinn as invisible tricksters that 'whisper' and confuse. Wetiko is the origin of the 'trickster god' theme that you find in cultures all over the world. Jinn, like the Archons, are Wetiko which is terrified of humans awakening and reconnecting with our true self for then its energy source has gone. With that the feedback loop breaks between Wetiko and human perception that provides the energetic momentum on which its very existence depends as a force of evil. Humans are both its target and its source of survival, but only if we are operating in low-vibrational states of fear, hate, depression and the background anxiety that most people suffer. We are Wetiko's target because we are its key to survival. It needs us, not the other way round. Paul A vampire has no intrinsic, independent, substantial existence

in its own right; it only exists in relation to us. The pathogenic, vampiric mind-parasite called wetiko is nothing in itself – not being able to exist from its own side – yet it has a ‘virtual reality’ such that it can potentially destroy our species ... ..The fact that a vampire is not reflected by a mirror can also mean that what we need to see is that there’s nothing, no-thing to see, other than ourselves. The fact that wetiko is the expression of something inside of us means that the cure for wetiko is with us as well. The critical issue is finding this cure within us and then putting it into effect. Evil begets evil because if evil does not constantly expand and find new sources of energetic sustenance its evil, its distortion, dies with the assimilation into balance and harmony. Love is the garlic to Wetiko’s vampire. Evil, the absence of love, cannot exist in the presence of love. I think I see a way out of here. I have emphasised so many times over the decades that the Archons/Wetiko and their Cult are not all powerful. They are not. I don’t care how it looks even now they are not. I have not called them liŕle boys in short trousers for effect. I have said it because it is true. Wetiko’s insatiable desire for power over others is not a sign of its omnipotence, but its insecurity. Paul Levy writes: ‘Due to the primal fear which ultimately drives it and which it is driven to cultivate, wetiko’s body politic has an intrinsic and insistent need for centralising power and control so as to create imagined safety for itself.’ Yeeeeeees! Exactly! Why does Wetiko want humans in an ongoing state of fear? Wetiko itself is fear and it is petrified of love. As evil is an absence of love, so love is an absence of fear. Love conquers all and especially Wetiko which is fear. Wetiko brought fear into the world when it wasn’t here before. Fear was the ‘fall’, the fall into low-frequency ignorance and illusion – fear is False Emotion Appearing Real. The simulation is driven and energised by fear because Wetiko/Yaldabaoth (fear) are the simulation. Fear is the absence of love and Wetiko is the absence We can now view current events from this level of perspective. The ‘Covid’ hoax has generated momentous amounts of ongoing fear, anxiety, depression and despair which have empowered Wetiko. No wonder people like Gates have been the instigators when they are Wetiko incarnate and exhibit every trait of Wetiko in the extreme. See how cold and unemotional these people are like Gates and his cronies, how dead of eye they are. That’s

Wetiko. Sabbatians are Wetiko and everything they control including the World Health Organization, Big Pharma and the 'vaccine' makers, national 'health' hierarchies, corporate media, Silicon Valley, the banking system, and the United Nations with its planned transformation into world government. All are controlled and possessed by the Wetiko distortion into distorting human society in its image. We are with this knowledge at the gateway to understanding the world. Divisions of race, culture, creed and sexuality are diversions to hide the real division between those possessed and influenced by Wetiko and those that are not. The 'Covid' hoax has brought both clearly into view. Human behaviour is not about race. Tyrants and dictatorships come in all colours and creeds. What unites the US president bombing the innocent and an African tribe committing genocide against another as in Rwanda? What unites them? Wetiko. All wars are Wetiko, all genocide is Wetiko, all hunger over centuries in a world of plenty is Wetiko. Children going to bed hungry, including in the West, is Wetiko. Cult-generated Woke racial divisions that focus on the body are designed to obscure the reality that divisions in behaviour are manifestations of mind, not body. Obsession with body identity and group judgement is a means to divert attention from the real source of behaviour – mind and perception. Conflict sown by the Woke both within themselves and with their target groups are Wetiko providing lunch for itself through still more agents of the division, chaos, and fear on which it feeds. The Cult is seeking to assimilate the entirety of humanity and all children and young people into the Wetiko frequency by manipulating them into states of fear and despair. Witness all the suicide and psychological unravelling since the spring of 2020. Wetiko psychopaths want to impose a state of unquestioning obedience to authority which is no more than a conduit for Wetiko to enforce its will and assimilate humanity into itself. It needs us to believe that resistance is futile when it fears resistance and even more so the game-changing non-cooperation with its impositions. It can use violent resistance for its benefit. Violent impositions and violent resistance are both Wetiko. The Power of Love with its Power of No will sweep Wetiko from our world. Wetiko and its Cult know that. They just don't want us to know. This brings me to AI or artificial intelligence and

something else Wetikos don't want us to know. What is AI really? I know about computer code algorithms and AI that learns from data input. These, however, are more diversions, the expeditionary force, for the real AI that they want to connect to the human brain as promoted by Silicon Valley Wetikos like Kurzweil. What is this AI? It is the frequency of Wetiko, the frequency of the Archons. The connection of AI to the human brain is the connection of the Wetiko frequency to create a Wetiko hive mind and complete the job of assimilation. The hive mind is planned to be controlled from Israel and China which are both 100 percent owned by Wetiko Sabbatians. The assimilation process has been going on minute by minute in the 'smart' era which fused with the 'Covid' era. We are told that social media is scrambling the minds of the young and changing their personality. This is true, but what is social media? Look more deeply at how it works, how it creates divisions and conflict, the hostility and cruelty, the targeting of people until they are destroyed. That's Wetiko. Social media is manipulated to tune people to the Wetiko frequency with all the emotional exploitation tricks employed by platforms like Facebook and its Wetiko front man, Zuckerberg. Facebook's Instagram announced a new platform for children to overcome a legal bar on them using the main site. This is more Wetiko exploitation and manipulation of kids. Amnesty International likened the plan to foxes offering to guard the henhouse and said it was incompatible with human rights. Since when did Wetiko or Zuckerberg (I repeat myself) care about that? Would Brin and Page at Google, Wojcicki at YouTube, Bezos at Amazon and whoever the hell runs Twiŕer act as they do if they were not channelling Wetiko? Would those who are developing technologies for no other reason than human control? How about those designing and selling technologies to kill people and Big Pharma drug and 'vaccine' producers who know they will end or devastate lives? Quite a thought for these people to consider is that if you are Wetiko in a human life you are Wetiko on the 'other side' unless your frequency changes and that can only change by a change of perception which becomes a change of behaviour. Where Gates is going does not bear thinking about although perhaps that's exactly where he wants to go. Either way, that's where he's going. His frequency will make it so. The frequency lair I have been saying for a

long time that a big part of the addiction to smartphones and devices is that a frequency is coming off them that entraps the mind. People spend ages on their phones and sometimes even a minute or so after they put them down they pick them up again and it all repeats. 'Covid' lockdowns will have increased this addiction a million times for obvious reasons. Addictions to alcohol overindulgence and drugs are another way that Wetiko entraps consciousness to attach to its own. Both are symptoms of low- vibrational psychological distress which alcoholism and drug addiction further compound. Do we think it's really a coincidence that access to them is made so easy while potions that can take people into realms beyond the simulation are banned and illegal? I have explored smartphone addiction in other books, the scale is mind-blowing, and that level of addiction does not come without help. Tech companies that make these phones are Wetiko and they will have no qualms about destroying the minds of children. We are seeing again with these companies the Wetiko perceptual combination of psychopathic enforcers and weak and meek unquestioning compliance by the rank and file. The global Smart Grid is the Wetiko Grid and it is crucial to complete the Cult endgame. The simulation is radiation and we are being deluged with technological radiation on a devastating scale. Wetiko frauds like Elon Musk serve Cult interests while occasionally criticising them to maintain his street-cred. 5G and other forms of Wi-Fi are being directed at the earth from space on a volume and scale that goes on increasing by the day. Elon Musk's (officially) SpaceX Starlink project is in the process of putting tens of thousands of satellites in low orbit to cover every inch of the planet with 5G and other Wi-Fi to create Kurzweil's global 'cloud' to which the human mind is planned to be attached very soon. SpaceX has approval to operate 12,000 satellites with more than 1,300 launched at the time of writing and applications filed for 30,000 more. Other operators in the Wi-Fi, 5G, low-orbit satellite market include OneWeb (UK), Telesat (Canada), and AST & Science (US). Musk tells us that AI could be the end of humanity and then launches a company called Neuralink to connect the human brain to computers. Musk's (in theory) Tesla company is building electric cars and the driverless vehicles of the smart control grid. As frauds and

bullshijers go Elon Musk in my opinion is Major League. 5G and technological radiation in general are destructive to human health, genetics and psychology and increasing the strength of artificial radiation underpins the five-sense perceptual bubbles which are themselves expressions of radiation or electromagnetism. Freedom activist John Whitehead was so right with his 'databit by databit, we are building our own electronic concentration camps'. The Smart Grid and 5G is a means to control the human mind and infuse perceptual information into The Field to influence anyone in sync with its frequency. You can change perception and behaviour en masse if you can manipulate the population into those levels of frequency and this is happening all around us today. The arrogance of Musk and his fellow Cult operatives knows no bounds in the way that we see with Gates. Musk's satellites are so many in number already they are changing the night sky when viewed from Earth. The astronomy community has complained about this and they have seen nothing yet. Some consequences of Musk's Wetiko hubris include: Radiation; visible pollution of the night sky; interference with astronomy and meteorology; ground and water pollution from intensive use of increasingly many spaceports; accumulating space debris; continual deorbiting and burning up of aging satellites, polluting the atmosphere with toxic dust and smoke; and ever-increasing likelihood of collisions. A collective public open lejer of complaint to Musk said: We are writing to you ... because SpaceX is in process of surrounding the Earth with a network of thousands of satellites whose very purpose is to irradiate every square inch of the Earth. SpaceX, like everyone else, is treating the radiation as if it were not there. As if the mitochondria in our cells do not depend on electrons moving undisturbed from the food we digest to the oxygen we breathe. As if our nervous systems and our hearts are not subject to radio frequency interference like any piece of electronic equipment. As if the cancer, diabetes, and heart disease that now afflict a majority of the Earth's population are not metabolic diseases that result from interference with our cellular machinery. As if insects everywhere, and the birds and animals that eat them, are not starving to death as a result. People like Musk and Gates believe in their limitless Wetiko arrogance that they can do whatever they like to the world



because they own it. Consequences for humanity are irrelevant. It's absolutely time that we stopped taking this shit from these self-styled masters of the Earth when you consider where this is going. Why is the Cult so anti-human? I hear this question often: Why would they do this when it will affect them, too? Ah, but will it? Who is this them? Forget their bodies. They are just vehicles for Wetiko consciousness. When you break it all down to the foundations we are looking at a state of severely distorted consciousness targeting another state of consciousness for assimilation. The rest is detail. The simulation is the fly-trap in which unique sensations of the five senses create a cycle of addiction called reincarnation. Renegade Minds see that everything which happens in our reality is a smaller version of the whole picture in line with the holographic principle. Addiction to the radiation of smart technology is a smaller version of addiction to the whole simulation. Connecting the body/brain to AI is taking that addiction on a giant step further to total ongoing control by assimilating human incarnate consciousness into Wetiko. I have watched during the 'Covid' hoax how many are becoming ever more profoundly attached to Wetiko's perceptual calling cards of aggressive response to any other point of view ('There is no other god but me'), psychopathic lack of compassion and empathy, and servile submission to the narrative and will of authority. Wetiko is the psychopaths and subservience to psychopaths. The Cult of Wetiko is so anti-human because it is not human. It embarked on a mission to destroy human by targeting everything that it means to be human and to survive as human. 'Covid' is not the end, just a means to an end. The Cult with its Wetiko consciousness is seeking to change Earth systems, including the atmosphere, to suit them, not humans. The gathering bombardment of 5G alone from ground and space is dramatically changing The Field with which the five senses interact. There is so much more to come if we sit on our hands and hope it will all go away. It is not meant to go away. It is meant to get ever more extreme and we need to face that while we still can – just. Carbon dioxide is the gas of life. Without that human is over. Kaput, gone, history. No natural world, no human. The Cult has created a cock and bull story about carbon dioxide and climate change to justify its reduction to the point where Gates and the ignoramus Biden 'climate

chief John Kerry want to suck it out of the atmosphere. Kerry wants to do this because his master Gates does. Wetikos have made the gas of life a demon with the usual support from the Wokers of Extinction Rebellion and similar organisations and the bewildered puppet-child that is Greta Thunberg who was put on the world stage by Klaus Schwab and the World Economic Forum. The name Extinction Rebellion is both ironic and as always Wetiko inversion. The gas that we need to survive must be reduced to save us from extinction. The most basic need of human is oxygen and we now have billions walking around in face nappies depriving body and brain of this essential requirement of human existence. More than that 5G at 60 gigahertz interacts with the oxygen molecule to reduce the amount of oxygen the body can absorb into the bloodstream. The obvious knock-on consequences of that for respiratory and cognitive problems and life itself need no further explanation. Psychopaths like Musk are assembling a global system of satellites to deluge the human atmosphere with this insanity. The man should be in jail. Here we have two most basic of human needs, oxygen and carbon dioxide, being dismantled. Two others, water and food, are geïng similar treatment with the United Nations Agendas 21 and 2030 – the Great Reset – planning to centrally control all water and food supplies. People will not even own rain water that falls on their land. Food is affected at the most basic level by reducing carbon dioxide. We have genetic modification or GMO infiltrating the food chain on a mass scale, pesticides and herbicides polluting the air and destroying the soil. Freshwater fish that provide livelihoods for 60 million people and feed hundreds of millions worldwide are being ‘pushed to the brink’ according the conservationists while climate change is the only focus. Now we have Gates and Schwab wanting to dispense with current food sources all together and replace them with a synthetic version which the Wetiko Cult would control in terms of production and who eats and who doesn’t. We have been on the Totalitarian Tiptoe to this for more than 60 years as food has become ever more processed and full of chemical shite to the point today when it’s not natural food at all. As Dr Tom Cowan says: ‘If it has a label don’t eat it.’ Bill Gates is now the biggest owner of farmland in the United States and he does nothing without an ulterior motive involving the Cult. Klaus

Schwab wrote: 'To feed the world in the next 50 years we will need to produce as much food as was produced in the last 10,000 years ... food security will only be achieved, however, if regulations on genetically modified foods are adapted to reflect the reality that gene editing offers a precise, efficient and safe method of improving crops.' Liar. People and the world are being targeted with aluminium through vaccines, chemtrails, food, drink cans, and endless other sources when aluminium has been linked to many health issues including dementia which is increasing year after year. Insects, bees and wildlife essential to the food chain are being deleted by pesticides, herbicides and radiation which 5G is dramatically increasing with 6G and 7G to come. The pollinating bee population is being devastated while wildlife including birds, dolphins and whales are having their natural radar blocked by the effects of ever-increasing radiation. In the summer windscreens used to be splattered with insects so numerous were they. It doesn't happen now. Where have they gone? The Cult is introducing genetically-modified versions of trees, plants and insects including a Gates-funded project to unleash hundreds of millions of genetically-modified, lab-altered and patented male mosquitoes to mate with wild mosquitoes and induce genetic flaws that cause them to die out. Clinically-insane Gates-funded Japanese researchers have developed mosquitos that spread vaccine and are dubbed 'flying vaccinators'. Gates is funding the modification of weather patterns in part to sell the myth that this is caused by carbon dioxide and he's funding geoengineering of the skies to change the atmosphere. Some of this came to light with the Gates-backed plan to release tonnes of chalk into the atmosphere to 'deflect the Sun and cool the planet'. Funny how they do this while the heating effect of the Sun is not factored into climate projections focussed on carbon dioxide. The reason is that they want to reduce carbon dioxide (so don't mention the Sun), but at the same time they do want to reduce the impact of the Sun which is so essential to human life and health. I have mentioned the sun-cholesterol-vitamin D connection as they demonise the Sun with warnings about skin cancer (caused by the chemicals in sun cream they tell you to splash on). They come from the other end of the process with statin drugs to reduce cholesterol that turns sunlight into

vitamin D. A lack of vitamin D leads to a long list of health effects and how vitamin D levels must have fallen with people confined to their homes over 'Covid'. Gates is funding other forms of geoengineering and most importantly chemtrails which are dropping heavy metals, aluminium and self-replicating nanotechnology onto the Earth which is killing the natural world. See Everything You Need To Know, But Have Never Been Told for the detailed background to this. Every human system is being targeted for deletion by a force that's not human. The Wetiko Cult has embarked on the process of transforming the human body from biological to synthetic biological as I have explained. Biological is being replaced by the artificial and synthetic – Archontic 'countermimicry' – right across human society. The plan eventually is to dispense with the human body altogether and absorb human consciousness – which it wouldn't really be by then – into cyberspace (the simulation which is Wetiko/Yaldabaoth). Preparations for that are already happening if people would care to look. The alternative media rightly warns about globalism and 'the globalists', but this is far bigger than that and represents the end of the human race as we know it. The 'bad copy' of prime reality that Gnostics describe was a bad copy of harmony, wonder and beauty to start with before Wetiko/Yaldabaoth set out to change the simulated 'copy' into something very different. The process was slow to start with. Entrapped humans in the simulation timeline were not technologically aware and they had to be brought up to intellectual speed while being suppressed spiritually to the point where they so. We have now reached that stage where technological intellect has the potential to destroy us and that's why events are moving so fast. Central American shaman Don Juan Matus said: Think for a moment, and tell me how you would explain the contradictions between the intelligence of man the engineer and the stupidity of his systems of belief, or the stupidity of his contradictory behaviour. Sorcerers believe that the predators have given us our systems of beliefs, our ideas of good and evil; our social mores. They are the ones who set up our dreams of success or failure. They have given us covetousness, greed, and cowardice. It is the predator who makes us complacent, routinary, and egomaniacal. In order to keep us obedient and meek and weak, the predators

engaged themselves in a stupendous manoeuvre – stupendous, of course, from the point of view of a fighting strategist; a horrendous manoeuvre from the point of those who suffer it. They gave us their mind. The predators' mind is baroque, contradictory, morose, filled with the fear of being discovered any For 'predators' see Wetiko, Archons, Yaldabaoth, Jinn, and all the other versions of the same phenomenon in cultures and religions all over the world. The theme is always the same because it's true and it's real. We have reached the point where we have to deal with it. The question is – how? Don't fight – walk away I thought I'd use a controversial subheading to get things moving in terms of our response to global fascism. What do you mean 'don't fight'? What do you mean 'walk away'? We've got to fight. We can't walk away. Well, it depends what we mean by fight and walk away. If fighting means physical combat we are playing Wetiko's game and falling for its trap. It wants us to get angry, aggressive, and direct hate and hostility at the enemy we think we must fight. Every war, every battle, every conflict, has been fought with Wetiko leading both sides. It's what it does. Wetiko wants a fight, anywhere, any place. Just hit me, son, so I can hit you back. Wetiko hits Wetiko and Wetiko hits Wetiko in return. I am very forthright as you can see in exposing Wetikos of the Cult, but I don't hate them. I refuse to hate them. It's what they want. What you hate you become. What you fight you become. Wokers, 'anti-haters' and 'anti-fascists' prove this every time they reach for their keyboards or don their balaclavas. By walk away I mean to disengage from Wetiko which includes ceasing to cooperate with its tyranny. Paul Levy says of Wetiko: The way to 'defeat' evil is not to try to destroy it (for then, in playing evil's game, we have already lost), but rather, to find the invulnerable place within ourselves where evil is unable to vanquish us – this is to truly 'win' our battle with evil. Wetiko is everywhere in human society and it's been on steroids since the 'Covid' hoax. Every shouting match over wearing masks has Wetiko wearing a mask and Wetiko not wearing one. It's an electrical circuit of push and resist, push and resist, with Wetiko pushing and resisting. Each polarity is Wetiko empowering itself. Dictionary definitions of 'resist' include 'opposing, refusing to accept or comply with' and the word to focus on is 'opposing'. What form does this take – seîng police cars alight or 'refusing

to accept or comply with'? The former is Wetiko opposing Wetiko while the other points the way forward. This is the difference between those aggressively demanding that government fascism must be obeyed who stand in stark contrast to the great majority of Pushbackers. We saw this clearly with a march by thousands of Pushbackers against lockdown in London followed days later by a Woker-hijacked protest in Bristol in which police cars were set on fire. Masks were virtually absent in London and widespread in Bristol. Wetiko wants lockdown on every level of society and infuses its aggression to police it through its unknowing stooges. Lockdown protesters are the ones with the smiling faces and the hugs, The two blatantly obvious states of being – geĵing more obvious by the day – are the result of Wokers and their like becoming ever more influenced by the simulation Field of Wetiko and Pushbackers ever more influenced by The Field of a far higher vibration beyond the simulation. Wetiko can't invade the heart which is where most lockdown opponents are coming from. It's the heart that allows them to see through the lies to the truth in ways I will be highlighting. Renegade Minds know that calmness is the place from which wisdom comes. You won't find wisdom in a hissing fit and wisdom is what we need in abundance right now. Calmness is not weakness – you don't have to scream at the top of your voice to be strong. Wetiko possessed and influenced don't know how to deal with that. Wetiko wants a fight and we should not give it one. What it needs more than anything is our cooperation and we should not give that either. Mass rallies and marches are great in that they are a visual representation of feeling, but if it ends there they are irrelevant. You demand that Wetikos act differently? Well, they're not going to are they? They are Wetikos. We don't need to waste our time demanding that something doesn't happen when that will make no difference. We need to delete the means that allows it to happen. This, invariably, is our cooperation. You can demand a child stop firing a peashooter at the dog or you can refuse to buy the peashooter. If you provide the means you are cooperating with the dog being smacked on the nose with a pea. How can the authorities enforce mask-wearing if millions in a country refuse? What if the 74 million Pushbackers that voted for Trump in 2020 refused to wear masks, close their businesses or

stay in their homes. It would be unenforceable. The few control the many through the compliance of the many and that's always been the dynamic be it 'Covid' regulations or the Roman Empire. I know people can find it intimidating to say no to authority or stand out in a crowd for being the only one with a face on display; but it has to be done or it's over. I hope I've made clear in this book that where this is going will be far more intimidating than standing up now and saying 'No' – I will not cooperate with my own enslavement and that of my children. There might be consequences for some initially, although not so if enough do the same. The question that must be addressed is what is going to happen if we don't? It is time to be strong and unyieldingly so. No means no. Not here and there, but everywhere and always. I have refused to wear a mask and obey all the other nonsense. I will not comply with tyranny. I repeat: Fascism is not imposed by fascists – there are never enough of them. Fascism is imposed by the population acquiescing to fascism. I will not do it. I will die first, or my body will. Living meekly under fascism is a form of death anyway, the death of the spirit that Martin Luther King described. Making things happen We must not despair. This is not over till it's over and it's far from that. The 'fat lady' must refuse to sing. The longer the 'Covid' hoax has dragged on and impacted on more lives we have seen an awakening of phenomenal numbers of people worldwide to the realisation that what they have believed all their lives is not how the world really is. Research published by the system-serving University of Bristol and King's College London in February, 2021, concluded: 'One in every 11 people in Britain say they trust David Icke's take on the coronavirus pandemic.' It will be more by now and we have gathering numbers to build on. We must urgently progress from seeing the scam to ceasing to cooperate with it. Prominent German lawyer Reiner Fuellmich, also licenced to practice law in America, is psychopaths to justice through a second Nuremberg tribunal for crimes against humanity. Fuellmich has an impressive record of beating the elite in court and he formed the German Corona Investigative Commiŕŕee to pursue civil charges against the main perpetrators with a view to triggering criminal charges. Most importantly he has grasped the foundation of the hoax – the PCR test not testing for the 'virus' – and Christian Drosten is therefore on his

charge sheet along with Gates frontman Tedros at the World Health Organization. Major players must be not be allowed to inflict their horrors on the human race without being brought to book. A life sentence must follow for Bill Gates and the rest of them. A group of researchers has also indicted the government of Norway for crimes against humanity with copies sent to the police and the International Criminal Court. The lawsuit cites participation in an internationally-planned false pandemic and violation of international law and human rights, the European Commission's definition of human rights by coercive rules, Nuremberg and Hague rules on fundamental human rights, and the Norwegian constitution. We must take the initiative from hereon and not just complain, protest and react. There are practical ways to support vital mass non-cooperation. Organising in numbers is one. Lockdown marches in London in the spring in 2021 were mass non-cooperation that the authorities could not stop. There were too many people. Hundreds of thousands walked the London streets in the centre of the road for mile after mile while the Face-Nappies could only look on. They were determined, but calm, and just did it with no histrionics and lots of smiles. The police were impotent. Others are organising group shopping without masks for mutual support and imagine if that was happening all over. Policing it would be impossible. If the store refuses to serve people in these circumstances they would be faced with a long line of trolleys full of goods standing on their own and everything would have to be returned to the shelves. How would they cope with that if it kept happening? I am talking here about moving on from complaining to being pro-active; from watching things happen to making things happen. I include in this our relationship with the police. The behaviour of many Face-Nappies has been disgraceful and anyone who thinks they would never find concentration camp guards in the 'enlightened' modern era have had that myth busted big-time. The period and setting may change – Wetikos never do. I watched film footage from a London march in which a police thug viciously kicked a protestor on the floor who had done nothing. His fellow Face-Nappies stood in a ring protecting him. What he did was a criminal assault and with a crowd far outnumbering the police this can no longer be allowed to happen unchallenged. I



get it when people chant 'shame on you' in these circumstances, but that is no longer enough. They have no shame those who do this. Crowds needs to start making a citizen's arrest of the police who commit criminal offences and brutally attack innocent people and defenceless women. A citizen's arrest can be made under section 24A of the UK Police and Criminal Evidence (PACE) Act of 1984 and you will find something similar in other countries. I prefer to call it a Common Law arrest rather than citizen's for reasons I will come to shortly. Anyone can arrest a person committing an indictable offence or if they have reasonable grounds to suspect they are committing an indictable offence. On both counts the attack by the police thug would have fallen into this category. A citizen's arrest can be made to stop someone: Causing physical injury to himself or any other person Suffering physical injury Causing loss of or damage to property Making off before a constable can assume responsibility for him A citizen's arrest may also be made to prevent a breach of the peace under Common Law and if they believe a breach of the peace will happen or anything related to harm likely to be done or already done in their presence. This is the way to go I think – the Common Law version. If police know that the crowd and members of the public will no longer be standing and watching while they commit their thuggery and crimes they will think twice about acting like Brownshirts and Blackshirts. Common Law – common sense Mention of Common Law is very important. Most people think the law is the law as in one law. This is not the case. There are two bodies of law, Common Law and Statute Law, and they are not the same. Common Law is founded on the simple premise of do no harm. It does not recognise victimless crimes in which no harm is done while Statute Law does. There is a Statute Law against almost everything. So what is Statute Law? Amazingly it's the law of the sea that was brought ashore by the Cult to override the law of the land which is Common Law. They had no right to do this and as always they did it anyway. They had to. They could not impose their will on the people through Common Law which only applies to do no harm. How could you stitch up the fine detail of people's lives with that? Instead they took the law of the sea, or Admiralty Law, and applied it to the population. Statute Law refers to all the laws spewing out of governments and

their agencies including all the fascist laws and regulations relating to 'Covid'. The key point to make is that Statute Law is contract law. It only applies between contracting corporations. Most police officers don't even know this. They have to be kept in the dark, too. Long ago when merchants and their sailing ships began to trade with different countries a contractual law was developed called Admiralty Law and other names. Again it only applied to contracts agreed between corporate entities. If there is no agreed contract the law of the sea had no jurisdiction and that still applies to its new alias of Statute Law. The problem for the Cult when the law of the sea was brought ashore was an obvious one. People were not corporations and neither were government entities. To overcome the laïer they made governments and all associated organisations corporations. All the institutions are private corporations and I mean governments and their agencies, local councils, police, courts, military, US states, the whole lot. Go to the Dun and Bradstreet corporate listings website for confirmation that they are all corporations. You are arrested by a private corporation called the police by someone who is really a private security guard and they take you to court which is another private corporation. Neither have jurisdiction over you unless you consent and contract with them. This is why you hear the mantra about law enforcement policing by consent of the people. In truth the people 'consent' only in theory through monumental trickery. Okay, the Cult overcame the corporate law problem by making governments and institutions corporate entities; but what about people? They are not corporations are they? Ah ... well in a sense, and only a sense, they are. Not people exactly – the illusion of people. The Cult creates a corporation in the name of everyone at the time that their birth certificate is issued. Note birth/ berth certificate and when you go to court under the law of the sea on land you stand in a dock. These are throwbacks to the origin. My Common Law name is David Vaughan Icke. The name of the corporation created by the government when I was born is called Mr David Vaughan Icke usually wriïen in capitals as MR DAVID VAUGHAN ICKE. That is not me, the living, breathing man. It is a fictitious corporate entity. The trick is to make you think that David Vaughan Icke and MR DAVID VAUGHAN ICKE are the same thing. They are not. When police charge you and take you to

court they are prosecuting the corporate entity and not the living, breathing, man or woman. They have to trick you into identifying as the corporate entity and contracting with them. Otherwise they have no jurisdiction. They do this through a language known as legalese. Lawful and legal are not the same either. Lawful relates to Common Law and legal relates to Statute Law. Legalese is the language of Statute Law which uses terms that mean one thing to the public and another in legalese. Notice that when a police officer tells someone why they are being charged he or she will say at the end: 'Do you understand?' To the public that means 'Do you comprehend?' In legalese it means 'Do you stand under me?' Do you stand under my authority? If you say yes to the question you are unknowingly agreeing to give them jurisdiction over you in a contract between two corporate entities. This is a confidence trick in every way. Contracts have to be agreed between informed parties and if you don't know that David Vaughan Icke is agreeing to be the corporation MR DAVID VAUGHAN ICKE you cannot knowingly agree to contract. They are deceiving you and another way they do this is to ask for proof of identity. You usually show them a driving licence or other document accepting that you are that corporate entity when you are not. Referring to yourself as a 'person' or 'citizen' is also identifying with your corporate fiction which is why I made the Common Law point about the citizen's arrest. If you are approached by a police officer you identify yourself immediately as a living, breathing, man or woman and say 'I do not consent, I do not contract with you and I do not understand' or stand under their authority. I have a Common Law birth certificate as a living man and these are available at no charge from [commonlawcourt.com](http://commonlawcourt.com). Businesses registered under the Statute Law system means that its laws apply. There are, however, ways to run a business under Common Law. Remember all 'Covid' laws and regulations are Statute Law – the law of contracts and you do not have to contract. This doesn't mean that you can kill someone and get away with it. Common Law says do no harm and that applies to physical harm, financial harm etc. Police are employees of private corporations and there needs to be a new system of non- corporate Common Law constables operating outside the Statute Law system. If you go to [davidicke.com](http://davidicke.com) and put Common Law into the search engine you will find

videos that explain Common Law in much greater detail. It is definitely a road we should walk. With all my heart I have heard people say that we are in a spiritual war. I don't like the term 'war' with its Wetiko dynamic, but I know what they mean. Sweep aside all the bodily forms and we are in a situation in which two states of consciousness are seeking very different realities. Wetiko wants upheaval, chaos, fear, suffering, conflict and control. The other wants love, peace, harmony, fairness and freedom. That's where we are. We should not fall for the idea that Wetiko is all-powerful and there's nothing we can do. Wetiko is not all-powerful. It's a joke, pathetic. It doesn't have to be, but it has made that choice for now. A handful of times over the years when I have felt the presence of its frequency I have allowed it to aîach briefly so I could consciously observe its nature. The experience is not pleasant, the energy is heavy and dark, but the ease with which you can kick it back out the door shows that its real power is in persuading us that it has power. It's all a con. Wetiko is a con. It's a trickster and not a power that can control us if we unleash our own. The con is founded on manipulating humanity to give its power to Wetiko which recycles it back to present the illusion that it has power when its power is ours that we gave away. This happens on an energetic level and plays out in the world of the seen as humanity giving its power to Wetiko authority which uses that power to control the population when the power is only the power the population has handed over. How could it be any other way for billions to be controlled by a relative few? I have had experiences with people possessed by Wetiko and again you can kick its arse if you do it with an open heart. Oh yes – the heart which can transform the world of perceived We are receiver-transmiîers and processors of information, but what information and where from? Information is processed into perception in three main areas – the brain, the heart and the belly. These relate to thinking, knowing, and emotion. Wetiko wants us to be head and belly people which means we think within the confines of the Matrix simulation and low-vibrational emotional reaction scrambles balance and perception. A few minutes on social media and you see how emotion is the dominant force. Woke is all emotion and is therefore thought-free and fact-free. Our heart is something different. It knows while the head thinks and has to try to

work it out because it doesn't know. The human energy field has seven prime vortexes which connect us with wider reality (Fig 23). Chakra means 'wheels of light' in the Sanskrit language of ancient India. The main ones are: The crown chakra on top of the head; brow (or 'third eye') chakra in the centre of the forehead; throat chakra; heart chakra in the centre of the chest; solar plexus chakra below the sternum; sacral chakra beneath the navel; and base chakra at the bottom of the spine. Each one has a particular function or functions. We feel anxiety and nervousness in the belly where the sacral chakra is located and this processes emotion that can affect the colon to give people 'the shits' or make them 'shit scared' when they are nervous. Chakras all play an important role, but the Mr and Mrs Big is the heart chakra which sits at the centre of the seven, above the chakras that connect us to the 'physical' and below those that connect with higher realms (or at least should). Here in the heart chakra we feel love, empathy and compassion - 'My heart goes out to you'. Those with closed hearts become literally 'heart-less' in their attitudes and behaviour (see Bill Gates). Native Americans portrayed Wetiko with what Paul Levy calls a 'frigid, icy heart, devoid of mercy' (see Bill Gates). Figure 23: The chakra system which interpenetrates the human energy field. The heart chakra is the governor - or should be. Wetiko trembles at the thought of heart energy which it cannot infiltrate. The frequency is too high. What it seeks to do instead is close the heart chakra vortex to block its perceptual and energetic influence. Psychopaths have 'hearts of stone' and emotionally-damaged people have 'heartache' and 'broken hearts'. The astonishing amount of heart disease is related to heart chakra disruption with its fundamental connection to the 'physical' heart. Dr Tom Cowan has written an outstanding book challenging the belief that the heart is a pump and making the connection between the 'physical' and spiritual heart. Rudolph Steiner who was way ahead of his time said the same about the fallacy that the heart is a pump. What? The heart is not a pump? That's crazy, right? Everybody knows that. Read Cowan's Human Heart, Cosmic Heart and you will realise that the very idea of the heart as a pump is ridiculous when you see the evidence. How does blood in the feet so far from the heart get pumped horizontally up the body by the heart?? Cowan explains in the book the real

reason why blood moves as it does. Our 'physical' heart is used to symbolise love when the source is really the heart vortex or spiritual heart which is our most powerful energetic connection to 'out there' expanded consciousness. That's why we feel knowing – intuitive knowing – in the centre of the chest. Knowing doesn't come from a process of thoughts leading to a conclusion. It is there in an instant all in one go. Our heart knows because of its connection to levels of awareness that do know. This is the meaning and source of intuition – intuitive

For the last more than 30 years of uncovering the global game and the nature of reality my heart has been my constant antenna for truth and accuracy. An American intelligence insider once said that I had quoted a disinformant in one of my books and yet I had only quoted the part that was true. He asked: 'How do you do that?' By using my heart antenna was the answer and anyone can do it. Heart- centred is how we are meant to be. With a closed heart chakra we withdraw into a closed mind and the bubble of five-sense reality. If you take a moment to focus your attention on the centre of your chest, picture a spinning wheel of light and see it opening and expanding. You will feel it happening, too, and perceptions of the heart like joy and love as the heart impacts on the mind as they interact. The more the chakra opens the more you will feel expressions of heart consciousness and as the process continues, and becomes part of you, insights and knowings will follow. An open heart is connected to that level of awareness that knows all is One. You will see from its perspective that the fault-lines that divide us are only illusions to control us. An open heart does not process the illusions of race, creed and sexuality except as brief experiences for a consciousness that is all. Our heart does not see division, only unity (Figs 24 and 25). There's something else, too. Our hearts love to laugh. Mark Twain's quote that says 'The human race has one really effective weapon, and that is laughter' is really a reference to the heart which loves to laugh with the joy of knowing the true nature of infinite reality and that all the madness of human society is an illusion of the mind. Twain also said: 'Against the assault of laughter nothing can stand.' This is so true of Wetiko and the Cult. Their insecurity demands that they be taken seriously and their power and authority acknowledged and feared. We

should do nothing of the sort. We should not get aggressive or fearful which their insecurity so desires. We should laugh in their face. Even in their no-face as police come over in their face-nappies and expect to be taken seriously. They don't take themselves seriously looking like that so why should we? Laugh in the face of intimidation. Laugh in the face of tyranny. You will see by its reaction that you have pressed all of its buttons. Wetiko does not know what to do in the face of laughter or when its targets refuse to concede their joy to fear. We have seen many examples during the 'Covid' hoax when people have expressed their energetic power and the string puppets of Wetiko retreat with their tail limp between their knees. Laugh – the world is bloody mad aĜer all and if it's a choice between laughter and tears I know which way I'm going.

Figure 24: Head consciousness without the heart sees division and everything apart from Figure 25: Heart consciousness sees everything as One. 'Vaccines' and the soul

The foundation of Wetiko/Archon control of humans is the separation of incarnate five-sense mind from the infinite 'I' and closing the heart chakra where the True 'I' lives during a human life. The goal has been to achieve complete separation in both cases. I was interested therefore to read an account by a French energetic healer of what she said she experienced with a patient who had been given the 'Covid' vaccine. Genuine energy healers can sense information and consciousness fields at different levels of being which are referred to as 'subtle bodies'. She described treating the patient who later returned aĜer having, without the healer's knowledge, two doses of the 'Covid vaccine'. The healer said: I noticed immediately the change, very heavy energy emanating from [the] subtle bodies. The scariest thing was when I was working on the heart chakra, I connected with her soul: it was detached from the physical body, it had no contact and it was, as if it was floating in a state of total confusion: a damage to the consciousness that loses contact with the physical body, i.e. with our biological machine, there is no longer any communication between them. I continued the treatment by sending light to the heart chakra, the soul of the person, but it seemed that the soul could no longer receive any light, frequency or energy. It was a very powerful experience for me. Then I understood that this substance is indeed used to detach consciousness so that this

consciousness can no longer interact through this body that it possesses in life, where there is no longer any contact, no frequency, no light, no more energetic balance or mind. This would create a human that is rudderless and at the extreme almost zombie-like operating with a fractional state of consciousness at the mercy of Wetiko. I was especially intrigued by what the healer said in the light of the prediction by the highly-informed Rudolf Steiner more than a hundred years ago. He said: In the future, we will eliminate the soul with medicine. Under the pretext of a 'healthy point of view', there will be a vaccine by which the human body will be treated as soon as possible directly at birth, so that the human being cannot develop the thought of the existence of soul and Spirit. To materialistic doctors will be entrusted the task of removing the soul of humanity. As today, people are vaccinated against this disease or that disease, so in the future, children will be vaccinated with a substance that can be produced precisely in such a way that people, thanks to this vaccination, will be immune to being subjected to the 'madness' of spiritual life. He would be extremely smart, but he would not develop a conscience, and that is the true goal of some materialistic circles. Steiner said the vaccine would detach the physical body from the etheric body (subtle bodies) and 'once the etheric body is detached the relationship between the universe and the etheric body would become extremely unstable, and man would become an automaton'. He said 'the physical body of man must be polished on this Earth by spiritual will – so the vaccine becomes a kind of arymanique (Wetiko) force' and 'man can no longer get rid of a given materialistic feeling'. Humans would then, he said, become 'materialistic of constitution and can no longer rise to the spiritual'. I have been writing for years about DNA being a receiver-transmitter of information that connects us to other levels of reality and these 'vaccines' changing DNA can be likened to changing an antenna and what it can transmit and receive. Such a disconnection would clearly lead to changes in personality and perception. Steiner further predicted the arrival of AI. Big Pharma 'Covid vaccine' makers, expressions of Wetiko, are testing their DNA-manipulating evil on children as I write with a view to giving the 'vaccine' to babies. If it's a soul-body disconnecter – and I say that it is or can be – every child would be disconnected



from 'soul' at birth and the 'vaccine' would create a closed system in which spiritual guidance from the greater self would play no part. This has been the ambition of Wetiko all along. A Pentagon video from 2005 was leaked of a presentation explaining the development of vaccines to change behaviour by their effect on the brain. Those that believe this is not happening with the 'Covid' genetically-modifying procedure masquerading as a 'vaccine' should make an urgent appointment with Naivety Anonymous. Klaus Schwab wrote in 2018: Neurotechnologies enable us to better influence consciousness and thought and to understand many activities of the brain. They include decoding what we are thinking in fine levels of detail through new chemicals and interventions that can influence our brains to correct for errors or enhance functionality. The plan is clear and only the heart can stop it. With every heart that opens, every mind that awakens, Wetiko is weakened. Heart and love are far more powerful than head and hate and so nothing like a majority is needed to turn this around. Beyond the Phantom Our heart is the prime target of Wetiko and so it must be the answer to Wetiko. We are our heart which is part of one heart, the infinite heart. Our heart is where the true self lives in a human life behind firewalls of five-sense illusion when an imposter takes its place – Phantom Self; but our heart waits patiently to be set free any time we choose to see beyond the Phantom, beyond Wetiko. A Wetikoed Phantom Self can wreak mass death and destruction while the love of forever is locked away in its heart. The time is here to unleash its power and let it sweep away the fear and despair that is Wetiko. Heart consciousness does not seek manipulated, censored, advantage for its belief or religion, its activism and desires. As an expression of the One it treats all as One with the same rights to freedom and opinion. Our heart demands fairness for itself no more than for others. From this unity of heart we can come together in mutual support and transform this Wetikoed world into what reality is meant to be – a place of love, joy, happiness, fairness, justice and freedom. Wetiko has another agenda and that's why the world is as it is, but enough of this nonsense. Wetiko can't stay where hearts are open and it works so hard to keep them closed. Fear is its currency and its food source and love in its true sense has no fear. Why would love have fear

when it knows it is All That Is, Has Been, And Ever Can Be on an eternal exploration of all possibility? Love in this true sense is not the physical attraction that passes for love. This can be an expression of it, yes, but Infinite Love, a love without condition, goes far deeper to the core of all being. It is the core of all being. Infinite reality was born from love beyond the illusions of the simulation. Love infinitely expressed is the knowing that all is One and the swiftly-passing experience of separation is a temporary hallucination. You cannot disconnect from Oneness; you can only perceive that you have and withdraw from its influence. This is the most important of all perception trickery by the mind parasite that is Wetiko and the foundation of all its potential for manipulation. If we open our hearts, open the sluice gates of the mind, and redefine self-identity amazing things start to happen. Consciousness expands or contracts in accordance with self-identity. When true self is recognised as infinite awareness and label self – Phantom Self – is seen as only a series of brief experiences life is transformed. Consciousness expands to the extent that self-identity expands and everything changes. You see unity, not division, the picture, not the pixels. From this we can play the long game. No more is an experience something in and of itself, but a fleeting moment in the eternity of forever. Suddenly people in uniform and dark suits are no longer intimidating and consequences for those actions take on the same nature of a brief experience that passes in the blink of an infinite eye. Intimidation is all in the mind. Beyond the mind there is An open heart does not consider consequences for what it knows be right and for a heart in its power that is never an option. The Renegade Mind is really the Renegade Heart. Consideration of consequences will always provide a getaway car for the mind and the heart doesn't want one. What is right in the light of what we face today is to stop cooperating with Wetiko in all its forms and to do it without fear or compromise. You cannot compromise with tyranny when tyranny always demands more until it has everything. Life is your perception and you are your destiny. Change your perception and you change your life. Change collective perception and we change the world. Come on people ... One human family, One heart, One goal ... We must settle for nothing less. The big scare story as the book goes to press is the 'Indian' variant and

the world is being deluged with propaganda about the 'Covid catastrophe' in India which mirrors in its lies and misrepresentations what happened in Italy before the first lockdown. The New York Post published a picture of someone who had 'collapsed in the street from Covid' in India in April, 2021, which was actually taken during a gas leak in May, 2020. Same old, same old. Media articles in mid-February were asking why India had been so untouched by 'Covid' and then as their vaccine rollout gathered pace the alleged 'cases' began to rapidly increase. Indian 'Covid vaccine' maker Bharat Biotech was funded into existence by the Bill and Melinda Gates Foundation (the pair announced their divorce in May, 2021, which is a pity because they so deserve each other). The Indian 'Covid crisis' was ramped up by the media to terrify the world and prepare people for submission to still more restrictions. The scam that worked the first time was being repeated only with far more people seeing through the deceit. Davidicke.com and Ickonic.com have sought to tell the true story of what is happening by talking to people living through the Indian nightmare which has nothing to do with 'Covid'. We posted a letter from 'Alisha' in Pune who told a very different story to government and media mendacity. She said scenes of dying people and overwhelmed hospitals were designed to hide what was really happening – genocide and starvation. Alisha said that millions had already died of starvation during the ongoing lockdowns while government and media were lying and making it look like the 'virus': Restaurants, shops, gyms, theatres, basically everything is shut. The cities are ghost towns. Even so-called 'essential' businesses are only open till 11am in the morning. You basically have just an hour to buy food and then your time is up. Inter-state travel and even inter-district travel is banned. The cops wait at all major crossroads to question why you are traveling outdoors or to fine you if you are not wearing a mask. The medical community here is also complicit in genocide, lying about hospitals being full and turning away people with genuine illnesses, who need immediate care. They have even created a shortage of oxygen cylinders. This is the classic Cult modus operandi played out in every country. Alisha said that people who would not have a PCR test not testing for the 'virus' were being denied hospital treatment. She said the people hit hardest were migrant workers

and those in rural areas. Most businesses employed migrant workers and with everything closed there were no jobs, no income and no food. As a result millions were dying of starvation or malnutrition. All this was happening under Prime Minister Narendra Modi, a 100-percent asset of the Cult, and it emphasises yet again the scale of pure anti- human evil we are dealing with. Australia banned its people from returning home from India with penalties for trying to do so of up to five years in jail and a fine of £37,000. The manufactured 'Covid' crisis in India was being prepared to justify further fascism in the West. Obvious connections could be seen between the Indian 'vaccine' programme and increased 'cases' and this became a common theme. The Seychelles, the most per capita 'Covid vaccinated' population in the world, went back into lockdown after a 'surge of cases'. Long ago the truly evil Monsanto agricultural biotechnology corporation with its big connections to Bill Gates devastated Indian farming with genetically-modified crops. Human rights activist Gurcharan Singh highlighted the efforts by the Indian government to complete the job by destroying the food supply to hundreds of millions with 'Covid' lockdowns. He said that 415 million people at the bottom of the disgusting caste system (still going whatever they say) were below the poverty line and struggled to feed themselves every year. Now the government was imposing lockdown at just the time to destroy the harvest. This deliberate policy was leading to mass starvation. People may reel back at the suggestion that a government would do that, but Wetiko-controlled 'leaders' are capable of any level of evil. In fact what is described in India is in the process of being instigated worldwide. The food chain and food supply are being targeted at every level to cause world hunger and thus control. Bill Gates is not the biggest owner of farmland in America for no reason and destroying access to food aids both the depopulation agenda and the plan for synthetic 'food' already being funded into existence by Gates. Add to this the coming hyper- inflation from the suicidal creation of fake 'money' in response to 'Covid' and the breakdown of container shipping systems and you have a cocktail that can only lead one way and is meant to. The Cult plan is to crash the entire system to 'build back better' with the Great Reports from all over the world continue to emerge of women

suffering menstrual and fertility problems after having the fake 'vaccine' and of the non-'vaccinated' having similar problems when interacting with the 'vaccinated'. There are far too many for 'coincidence' to be credible. We've had menopausal women getting periods, others having periods stop or not stopping for weeks, passing clots, sometimes the lining of the uterus, breast irregularities, and miscarriages (which increased by 400 percent in parts of the United States). Non-'vaccinated' men and children have suffered blood clots and nose bleeding after interaction with the 'vaccinated'. Babies have died from the effects of breast milk from a 'vaccinated' mother. Awake doctors – the small minority – speculated on the cause of non-'vaccinated' suffering the same effects as the 'vaccinated'. Was it nanotechnology in the synthetic substance transmitting frequencies or was it a straight chemical bioweapon that was being transmitted between people? I am not saying that some kind of chemical transmission is not one possible answer, but the foundation of all that the Cult does is frequency and this is fertile ground for understanding how transmission can happen. American doctor Carrie Madej, an internal medicine physician and osteopath, has been practicing for the last 20 years, teaching medical students, and she says attending different meetings where the agenda for humanity was discussed. Madej, who operates out of Georgia, did not dismiss other possible forms of transmission, but she focused on frequency in search of an explanation for transmission. She said the Moderna and Pfizer 'vaccines' contained nano-lipid particles as a key component. This was a brand new technology never before used on humanity. 'They're using a nanotechnology which is pretty much like tiny computer bits ... nanobots or hydrogel.' Inside the 'vaccines' was 'this sci-fi kind of substance' which suppressed immune checkpoints to get into the cell. I referred to this earlier as the 'Trojan horse' technique that tricks the cell into opening a gateway for the self-replicating synthetic material and while the immune system is artificially suppressed the body has no defences. Madej said the substance served many purposes including an on-demand ability to 'deliver the payload' and using the nano 'computer bits' as biosensors in the body. 'It actually has the ability to accumulate data from your body, like your breathing, your respiration, thoughts, emotions, all kinds She said the

technology obviously has the ability to operate through Wi-Fi and transmit and receive energy, messages, frequencies or impulses. 'Just imagine you're geïjing this new substance in you and it can react to things all around you, the 5G, your smart device, your phones.' We had something completely foreign in the human body that had never been launched large scale at a time when we were seeing 5G going into schools and hospitals (plus the Musk satellites) and she believed the 'vaccine' transmission had something to do with this: '... if these people have this inside of them ... it can act like an antenna and actually transmit it outwardly as well.' The synthetic substance produced its own voltage and so it could have that kind of effect. This fits with my own contention that the nano receiver-transmiïjers are designed to connect people to the Smart Grid and break the receiver-transmiïjer connection to expanded consciousness. That would explain the French energy healer's experience of the disconnection of body from 'soul' with those who have had the 'vaccine'. The nanobots, self-replicating inside the body, would also transmit the synthetic frequency which could be picked up through close interaction by those who have not been 'vaccinated'. Madej speculated that perhaps it was 5G and increased levels of other radiation that was causing the symptoms directly although interestingly she said that non-'vaccinated' patients had shown improvement when they were away from the 'vaccinated' person they had interacted with. It must be remembered that you can control frequency and energy with your mind and you can consciously create energetic barriers or bubbles with the mind to stop damaging frequencies from penetrating your field. American paediatrician Dr Larry Palevsky said the 'vaccine' was not a 'vaccine' and was never designed to protect from a 'viral' infection. He called it 'a massive, brilliant propaganda of genocide' because they didn't have to inject everyone to get the result they wanted. He said the content of the jabs was able to infuse any material into the brain, heart, lungs, kidneys, liver, sperm and female productive system. 'This is genocide; this is a weapon of mass destruction.' At the same time American colleges were banning students from aïjending if they didn't have this life-changing and potentially life-ending 'vaccine'. Class action lawsuits must follow when the consequences of this college fascism come to light. As the book was going to press came

reports about fertility effects on sperm in 'vaccinated' men which would absolutely fit with what I have been saying and hospitals continued to fill with 'vaccine' reactions. Another question is what about transmission via blood transfusions? The NHS has extended blood donation restrictions from seven days after a 'Covid vaccination' to 28 days after even a sore arm reaction. I said in the spring of 2020 that the then touted 'Covid vaccine' would be ongoing each year like the flu jab. A year later Pfizer CEO, the appalling Albert Bourla, said people would 'likely' need a 'booster dose' of the 'vaccine' within 12 months of getting 'fully vaccinated' and then a yearly shot. 'Variants will play a key role', he said confirming the point. Johnson & Johnson CEO Alex Gorsky also took time out from his 'vaccine' disaster to say that people may need to be vaccinated against 'Covid-19' each year. UK Health Secretary, the psychopath Matt Hancock, said additional 'boosters' would be available in the autumn of 2021. This is the trap of the 'vaccine passport'. The public will have to accept every last 'vaccine' they introduce, including for the fake 'variants', or it would cease to be valid. The only other way in some cases would be continuous testing with a test not testing for the 'virus' and what is on the swabs constantly pushed up your nose towards the brain every time? 'Vaccines' changing behaviour I mentioned in the body of the book how I believed we would see gathering behaviour changes in the 'vaccinated' and I am already hearing such comments from the non-'vaccinated' describing behaviour changes in friends, loved ones and work colleagues. This will only increase as the self-replicating synthetic material and nanoparticles expand in body and brain. An article in the Guardian in 2016 detailed research at the University of Virginia in Charlottesville which developed a new method for controlling brain circuits associated with complex animal behaviour. The method, dubbed 'magnetogenetics', involves genetically-engineering a protein called ferritin, which stores and releases iron, to create a magnetised substance – 'Magnetite' – that can activate specific groups of nerve cells from a distance. This is claimed to be an advance on other methods of brain activity manipulation known as optogenetics and chemogenetics (the Cult has been developing methods of brain control for a long time). The ferritin technique is said to be non-invasive and able to activate

neurons 'rapidly and reversibly'. In other words, human thought and perception. The article said that earlier studies revealed how nerve cell proteins 'activated by heat and mechanical pressure can be genetically engineered so that they become sensitive to radio waves and magnetic fields, by attaching them to an iron-storing protein called ferritin, or to inorganic paramagnetic particles'. Sensitive to radio waves and magnetic fields? You mean like 5G, 6G and 7G? This is the human-AI Smart Grid hive mind we are talking about. The Guardian article said: ... the researchers injected Magneto into the striatum of freely behaving mice, a deep brain structure containing dopamine-producing neurons that are involved in reward and motivation, and then placed the animals into an apparatus split into magnetised and non-magnetised. Mice expressing Magneto spent far more time in the magnetised areas than mice that did not, because activation of the protein caused the striatal neurons expressing it to release dopamine, so that the mice found being in those areas rewarding. This shows that Magneto can remotely control the firing of neurons deep within the brain, and also control complex. Make no mistake this basic methodology will be part of the 'Covid vaccine' cocktail and using magnetics to change brain function through electromagnetic field frequency activation. The Pentagon is developing a 'Covid vaccine' using ferritin. Magnetism would explain changes in behaviour and why videos are appearing across the Internet as I write showing how magnets stick to the skin at the point of the 'vaccine' shot. Once people take these 'vaccines' anything becomes possible in terms of brain function and illness which will be blamed on 'Covid-19' and 'variants'. Magnetic field manipulation would further explain why the non-'vaccinated' are reporting the same symptoms as the 'vaccinated' they interact with and why those symptoms are reported to decrease when not in their company. Interestingly 'Magneto', a 'mutant', is a character in the Marvel Comic X-Men stories with the ability to manipulate magnetic fields and he believes that mutants should fight back against their human oppressors by any means necessary. The character was born Erik Lehnsherr to a Jewish family in Germany. The European Court of Human Rights opened the door for mandatory 'Covid-19 vaccines' across the continent when it ruled in a Czech Republic dispute



over childhood immunisation that legally enforced vaccination could be 'necessary in a democratic society'. The 17 judges decided that compulsory vaccinations did not breach human rights law. On the face of it the judgement was so inverted you gasp for air. If not having a vaccine infused into your body is not a human right then what is? Ah, but they said human rights law which has been specifically written to delete all human rights at the behest of the state (the Cult). Article 8 of the European Convention on Human Rights relates to the right to a private life. The crucial word here is 'except': There shall be no interference by a public authority with the exercise of this right EXCEPT such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic wellbeing of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others [My emphasis]. No interference except in accordance with the law means there are no 'human rights' except what EU governments decide you can have at their behest. 'As is necessary in a democratic society' explains that reference in the judgement and 'in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others' gives the EU a coach and horses to ride through 'human rights' and scatter them in all directions. The judiciary is not a check and balance on government extremism; it is a vehicle to enforce it. This judgement was almost laughably predictable when the last thing the Cult wanted was a decision that went against mandatory vaccination. Judges rule over and over again to benefit the system of which they are a part. Vaccination disputes that come before them are invariably delivered in favour of doctors and authorities representing the view of the state which owns the judiciary. Oh, yes, and we have even had calls to stop putting 'Covid-19' on death certificates within 28 days of a 'positive test' because it is claimed the practice makes the 'vaccine' appear not to work. They are laughing. The scale of madness, inhumanity and things to come was highlighted when those not 'vaccinated' for 'Covid' were refused evacuation from the Caribbean island of St Vincent during massive volcanic eruptions. Cruise

ships taking residents to the safety of another island allowed only the 'vaccinated' to board and the rest were left to their fate. Even in life and death situations like this we see 'Covid' stripping people of their most basic human instincts and the insanity is even more extreme when you think that fake 'vaccine'-makers are not even claiming their body-manipulating concoctions stop 'infection' and 'transmission' of a 'virus' that doesn't exist. St Vincent Prime Minister Ralph Gonsalves said: 'The chief medical officer will be identifying the persons already vaccinated so that we can get them on the ship.' Note again the power of the chief medical officer who, like Whitty in the UK, will be answering to the World Health Organization. This is the Cult network structure that has overridden politicians who 'follow the and 'science advisers' tell them. Gonsalves even said that residents who were 'vaccinated' after the order so they could board the ships would still be refused entry due to possible side effects such as 'wooziness in the head'. The good news is that if they were woozy enough in the head they could qualify to be prime minister of St Vincent. The European judgement will be used at some point to justify moves to enforce the 'Covid' DNA-manipulating procedure. Sandra Ro, CEO of the Global Blockchain Business Council, told a World Economic Forum event that she hoped 'vaccine passports' would help to 'drive forced consent and standardisation' of global digital identity schemes: 'I'm hoping with the desire and global demand for some sort of vaccine passport – so that people can get travelling and working again – [it] will drive forced consent, standardisation, and frankly, cooperation across the world.' The lady is either not very bright, or thoroughly mendacious, to use the term 'forced consent'. You do not 'consent' if you are forced – you submit. She was describing what the plan has been all along and that's to enforce a digital identity on every human without which they could not function. 'Vaccine passports' are opening the door and are far from the end goal. A digital identity would allow you to be tracked in everything you do in cyberspace and this is the same technique used by Cult-owned China to enforce its social credit system of total control. The ultimate 'passport' is planned to be a microchip as my books have warned for nearly 30 years. Those nice people at the Pentagon working for the Cult-controlled Defense Advanced Research Projects Agency

(DARPA) claimed in April, 2021, they have developed a microchip inserted under the skin to detect 'asymptomatic Covid-19 infection' before it becomes an outbreak and a 'revolutionary filter' that can remove the 'virus' from the blood when attached to a dialysis machine. The only problems with this are that the 'virus' does not exist and people transmitting the 'virus' with no symptoms is brain-numbing bullshit. This is, of course, not a ruse to get people to be microchipped for very different reasons. DARPA also said it was producing a one-stop 'vaccine' for the 'virus' and all 'variants'. One of the most sinister organisations insane because Wetiko that possesses them is insane. Researchers from the Salk Institute in California announced they have created an embryo that is part human and part monkey. My books going back to the 1990s have exposed experiments in top secret underground facilities in the United States where humans are being crossed with animal and non-human 'extraterrestrial' species. They are now easing that long-developed capability into the public arena and there is much more to come given we are dealing with psychiatric basket cases. Talking of which – Elon Musk's scientists at Neuralink trained a monkey to play Pong and other puzzles on a computer screen using a joystick and when the monkey made the correct move a metal tube squirted banana smoothie into his mouth which is the basic technique for training humans into unquestioning compliance. Two Neuralink chips were in the monkey's skull and more than 2,000 wires 'fanned out' into its brain. Eventually the monkey played a video game purely with its brain waves. Psychopathic narcissist Musk said the 'breakthrough' was a step towards putting Neuralink chips into human skulls and merging minds with artificial intelligence. Exactly. This man is so dark and Cult to his DNA. World Economic Fascism (WEF) The World Economic Forum is telling you the plan by the statements made at its many and various events. Cult-owned fascist YouTube CEO Susan Wojcicki spoke at the 2021 WEF Global Technology Governance Summit (see the name) in which 40 governments and 150 companies met to ensure 'the responsible design and deployment of emerging technologies'. Orwellian translation: 'Ensuring the design and deployment of long-planned technologies will advance the Cult agenda for control and censorship.' Freedom- destroyer and Nuremberg-bound

Wojcicki expressed support for tech platforms like hers to censor content that is 'technically legal but could be harmful'. Who decides what is 'harmful'? She does and they do. 'Harmful' will be whatever the Cult doesn't want people to see and we have legislation proposed by the UK government that would censor content on the basis of 'harm' no matter if the information is fair, legal and provably true. Make that especially if it is fair, legal and provably true. Wojcicki called for a global coalition to be formed to enforce content moderation standards through automated censorship. This is a woman and mega-censor so self-deluded that she shamelessly accepted a 'free expression' award – Wojcicki – in an event sponsored by her own YouTube. They have no shame and no self-awareness. You know that 'Covid' is a scam and Wojcicki a Cult operative when YouTube is censoring medical and scientific opinion purely on the grounds of whether it supports or opposes the Cult 'Covid' narrative. Florida governor Ron DeSantis compiled an expert panel with four professors of medicine from Harvard, Oxford, and Stanford Universities who spoke against forcing children and vaccinated people to wear masks. They also said there was no proof that lockdowns reduced spread or death rates of 'Covid-19'. Cult-gofer Wojcicki and her YouTube deleted the panel video 'because it included content that contradicts the consensus of local and global health authorities regarding the efficacy of masks to prevent the spread of Covid-19'. This 'consensus' refers to what the Cult tells the World Health Organization to say and the WHO tells 'local health authorities' to do. Wojcicki knows this, of course. The panellists pointed out that censorship of scientific debate was responsible for deaths from many causes, but Wojcicki couldn't care less. She would not dare go against what she is told and as a disgrace to humanity she wouldn't want to anyway. The UK government is seeking to pass a fascist 'Online Safety Bill' to specifically target with massive fines and other means non-censored video and social media platforms to make them censor 'lawful but harmful' content like the Cult-owned Facebook, Twitter, Google and YouTube. What is 'lawful but harmful' would be decided by the fascist Blair-created Ofcom. Another WEF obsession is a cyber-attack on the financial system and this is clearly what the Cult has planned to take down the bank accounts of everyone – except theirs. Those that think they have

enough money for the Cult agenda not to matter to them have got a big lesson coming if they continue to ignore what is staring them in the face. The World Economic Forum, funded by Gates and fronted by Klaus Schwab, announced it would be running a 'simulation' with the Russian government and global banks of just such an attack called Cyber Polygon 2021. What they simulate – as with the 'Covid' Event 201 – they plan to instigate. The WEF is involved in a project with the Cult-owned Carnegie Endowment for International Peace called the WEF-Carnegie Cyber Policy Initiative which seeks to merge Wall Street banks, 'regulators' (I love it) and intelligence agencies to 'prevent' (arrange and allow) a cyber-attack that would bring down the global financial system as long planned by those that control the WEF and the Carnegie operation. The Carnegie Endowment for International Peace sent an instruction to First World War US President Woodrow Wilson not to let the war end before society had been irreversibly transformed. The Wuhan lab diversion As I close, the Cult-controlled authorities and lapdog media are systematically pushing 'the virus was released from the Wuhan lab' narrative. There are two versions – it happened by accident and it happened on purpose. Both are nonsense. The perceived existence of the never-shown-to-exist 'virus' is vital to sell the impression that there is actually an infective agent to deal with and to allow the endless potential for terrifying the population with 'variants' of a 'virus' that does not exist. The authorities at the time of writing are going with the 'by accident' while the alternative media is promoting the 'on purpose'. Cable news host Tucker Carlson who has questioned aspects of lockdown and 'vaccine' compulsion has bought the Wuhan lab story. 'Everyone now agrees' he said. Well, I don't and many others don't and the question is why does the system and its media suddenly 'agree'? When the media moves as one unit with a narrative it is always a lie – witness the hour by hour mendacity of the 'Covid' era. Why would this Cult-owned combination which has unleashed lies like machine gun fire suddenly 'agree' to tell the truth?? Much of the alternative media is buying the lie because it fits the conspiracy narrative, but it's the wrong conspiracy. The real conspiracy is that there is no virus and that is what the Cult is desperate to hide. The idea that the 'virus' was released by accident is ludicrous when the

whole 'Covid' hoax was clearly long-planned and waiting to be played out as it was so fast in accordance with the Rockefeller document and Event 201. So they prepared everything in detail over decades and then sat around strumming their fingers waiting for an 'accidental' release from a bio-lab? What?? It's crazy. Then there's the 'on purpose' claim. You want to circulate a 'deadly virus' and hide the fact that you've done so and you release it down the street from the highest-level bio-lab in China? I repeat – What?? You would release it far from that lab to stop any association being made. But, no, we'll do it in a place where the connection was certain to be made. Why would you need to scam 'cases' and 'deaths' and pay hospitals to diagnose 'Covid-19' if you had a real 'virus'? What Where were all the mass deaths in Wuhan from a 'deadly pathogen' when the recovery to normal life after the initial propaganda was dramatic in speed? Why isn't the 'deadly pathogen' now circulating all over China with bodies in the street? Once again we have the technique of tell them what they want to hear and they will likely believe it. The alternative media has its 'conspiracy' and with Carlson it fits with his 'China is the danger' narrative over years. China is a danger as a global Cult operations centre, but not for this reason. The Wuhan lab story also has the potential to instigate conflict with China when at some stage the plan is to trigger a Problem-Reaction-Solution confrontation with the West. Question everything – everything – and especially when the media agrees on a common party line. Third wave ... fourth wave ... fifth wave ... As the book went into production the world was being set up for more lockdowns and a 'third wave' supported by invented 'variants' that were increasing all the time and will continue to do so in public statements and computer programs, but not in reality. India became the new Italy in the 'Covid' propaganda campaign and we were told to be frightened of the new 'Indian strain'. Somehow I couldn't find it within myself to do so. A document produced for the UK government entitled 'Summary of further modelling of easing of restrictions – Roadmap Step 2' declared that a third wave was inevitable (of course when it's in the script) and it would be the fault of children and those who refuse the health-destroying fake 'Covid vaccine'. One of the computer models involved came from the Cult- owned

Imperial College and the other from Warwick University which I wouldn't trust to tell me the date in a calendar factory. The document states that both models presumed extremely high uptake of the 'Covid vaccines' and didn't allow for 'variants'. The document states: 'The resurgence is a result of some people (mostly children) being ineligible for vaccination; others choosing not to receive the vaccine; and others being vaccinated but not perfectly protected.' The mendacity takes the breath away. Okay, blame those with a brain who won't take the DNA-modifying shots and put more pressure on children to have it as 'trials' were underway involving children as young as six months with parents who give insanity a bad name. Massive pressure is being put on the young to have the fake 'vaccine' and child age consent limits have been systematically lowered around the world to stop parents intervening. Most extraordinary about the document was its claim that the 'third wave' would be driven by 'the resurgence in both hospitalisations and deaths ... dominated by those that have received two doses of the vaccine, comprising around 60-70% of the wave respectively'. The predicted peak of the 'third wave' suggested 300 deaths per day with 250 of them fully 'vaccinated' people. How many more lies do acquiescers need to be told before they see the obvious? Those who took the jab to 'protect themselves' are projected to be those who mostly get sick and die? So what's in the 'vaccine'? The document went on: It is possible that a summer of low prevalence could be followed by substantial increases in incidence over the following autumn and winter. Low prevalence in late summer should not be taken as an indication that SARS-CoV-2 has retreated or that the population has high enough levels of immunity to prevent another wave. They are telling you the script and while many British people believed 'Covid' restrictions would end in the summer of 2021 the government was preparing for them to be ongoing. Authorities were awarding contracts for 'Covid marshals' to police the restrictions with contracts starting in July, 2021, and going through to January 31st, 2022, and the government was advertising for 'Media Buying Services' to secure media propaganda slots worth a potential £320 million for 'Covid-19 campaigns' with a contract not ending until March, 2022. The recipient – via a list of other front companies – was reported to be American media marketing giant Omnicom Group

Inc. While money is no object for 'Covid' the UK waiting list for all other treatment – including life-threatening conditions – passed 4.5 million. Meantime the Cult is seeking to control all official 'inquiries' to block revelations about what has really been happening and why. It must not be allowed to – we need Nuremberg jury trials in every country. The cover-up doesn't get more obvious than appointing ultra-Zionist professor Philip Zelikow to oversee two dozen US virologists, public health officials, clinicians, former government officials and four American 'charitable foundations' to 'learn the lessons' of the 'Covid' debacle. The personnel will be those that created and perpetuated the 'Covid' lies while Zelikow is the former executive director of the 9/11 Commission who ensured that the truth about those a^jacks never came out and produced a report that must be among the most mendacious and manipulative documents ever wri^jen – see The Trigger for the detailed exposure of the almost unimaginable 9/11 story in which Sabbatians can be found at every Passive no more People are increasingly challenging the authorities with amazing numbers of people taking to the streets in London well beyond the ability of the Face-Nappies to stop them. Instead the Nappies choose situations away from the mass crowds to target, intimidate, and seek to promote the impression of 'violent protestors'. One such incident happened in London's Hyde Park. Hundreds of thousands walking through the streets in protest against 'Covid' fascism were ignored by the Cult-owned BBC and most of the rest of the mainstream media, but they delighted in reporting how police were injured in 'clashes with protestors'. The truth was that a group of people gathered in Hyde Park at the end of one march when most had gone home and they were peacefully having a good time with music and chat. Face-Nappies who couldn't deal with the full-march crowd then waded in with their batons and got more than they bargained for. Instead of just standing for this criminal brutality the crowd used their numerical superiority to push the Face-Nappies out of the park. Eventually the Nappies turned and ran. Unfortunately two or three idiots in the crowd threw drink cans striking two officers which gave the media and the government the image they wanted to discredit the 99.9999 percent who were peaceful. The idiots walked straight into the trap and we must always be



aware of potential agent provocateurs used by the authorities to discredit their targets. This response from the crowd – the can people apart – must be a turning point when the public no longer stand by while the innocent are arrested and brutally aĵacked by the Face-Nappies. That doesn't mean to be violent, that's the last thing we need. We'll leave the violence to the Face-Nappies and government. But it does mean that when the Face-Nappies use violence against peaceful people the numerical superiority is employed to stop them and make citizen's arrests or Common Law arrests for a breach of the peace. The time for being passive in the face of fascism is over. We are the many, they are the few, and we need to make that count before there is no freedom leĜ and our children and grandchildren face an ongoing fascist nightmare. COME ON PEOPLE – IT'S TIME. One final thought ... The power of love A force from above Cleaning my soul Flame on burn desire Love with tongues of fire Purge the soul Make love your goal I'll protect you from the hooded claw Keep the vampires from your door When the chips are down I'll be around With my undying, death-defying Love for you Envy will hurt itself Let yourself be beautiful Sparkling love, flowers And pearls and preĵy girls Love is like an energy Rushin' rushin' inside of me This time we go sublime Lovers entwine, divine, divine, Love is danger, love is pleasure Love is pure – the only treasure I'm so in love with you Purge the soul Make love your goal The power of love A force from above Cleaning my soul The power of love A force from above A sky-scraping dove Flame on burn desire Love with tongues of fire Purge the soul Make love your goal Frankie Goes To Hollywood Cowan-Kaufman-Morell

Statement on Virus Isolation Isolation: The action of isolating; the fact or condition of being isolated or standing alone; separation from other things or persons; Oxford English Dictionary

he controversy over whether the SARS-CoV-2 virus has ever been isolated or purified continues. However, using the above definition, common sense, the laws of logic and the dictates of science, any unbiased person must come to the conclusion that the SARS-CoV-2 virus has never been isolated or purified. As a result, no confirmation of the virus' existence can be found. The logical, common sense, and scientific consequences of this fact are: the structure and composition of something not shown to exist can't be known, including the

presence, structure, and function of any hypothetical spike or other proteins; the genetic sequence of something that has never been found can't "variants" of something that hasn't been shown to exist can't be it's impossible to demonstrate that SARS-CoV-2 causes a disease

In as concise terms as possible, here's the proper way to isolate, characterize and demonstrate a new virus. First, one takes samples (blood, sputum, secretions) from many people (e.g. 500) with symptoms which are unique and specific enough to characterize an illness. Without mixing these samples with ANY tissue or products that also contain genetic material, the virologist macerates, filters and ultracentrifuges i.e. purifies the specimen. This common virology technique, done for decades to isolate bacteriophages<sup>1</sup> and so-called giant viruses in every virology lab, then allows the virologist to demonstrate with electron microscopy thousands of identically sized and shaped particles. These particles are the isolated and purified. These identical particles are then checked for uniformity by physical and/or microscopic techniques. Once the purity is determined, the particles may be further characterized. This would include examining the structure, morphology, and chemical composition of the particles. Next, their genetic makeup is characterized by extracting the genetic material directly from the purified particles and using genetic-sequencing techniques, such as Sanger sequencing, that have also been around for decades. Then one does an analysis to confirm that these uniform particles are exogenous (outside) in origin as a virus is conceptualized to be, and not the normal breakdown products of dead and dying tissues.<sup>2</sup> (As of May 2020, we know that virologists have no way to determine whether the particles they're seeing are viruses or just normal break-down products of dead and dying tissues.)<sup>3</sup>

Isolation, characterization and analysis of bacteriophages from the haloalkaline lake Elmenteita, Kenya  
Juliah Khayeli Akhwale et al, PLOS One, Published: April 25, 2019. "Extracellular Vesicles Derived From Apoptotic Cells: An Essential Link Between Death and Regeneration," Maojiao Li<sup>1</sup> et al, Frontiers in Cell and Developmental Biology, 2020 October 2. "The Role of Extraellular Vesicles as Allies of HIV, HCV and SARS Viruses," Flavia Giannessi, et al, Viruses, 2020 May

If we have come this far then we have fully isolated, characterized, and genetically sequenced an

exogenous virus particle. However, we still have to show it is causally related to a disease. This is carried out by exposing a group of healthy subjects (animals are usually used) to this isolated, purified virus in the manner in which the disease is thought to be transmitted. If the animals get sick with the same disease, as confirmed by clinical and autopsy findings, one has now shown that the virus actually causes a disease. This demonstrates infectivity and transmission of an infectious agent. None of these steps has even been attempted with the SARS-CoV-2 virus, nor have all these steps been successfully performed for any so-called pathogenic virus. Our research indicates that a single study showing these steps does not exist in the medical literature. Instead, since 1954, virologists have taken unpurified samples from a relatively few people, often less than ten, with a similar disease. They then minimally process this sample and inoculate this unpurified sample onto tissue culture containing usually four to six other types of material – all of which contain identical genetic material as to what is called a “virus.” The tissue culture is starved and poisoned and naturally disintegrates into many types of particles, some of which contain genetic material. Against all common sense, logic, use of the English language and scientific integrity, this process is called “virus isolation.” This brew containing fragments of genetic material from many sources is then subjected to genetic analysis, which then creates in a computer- simulation process the alleged sequence of the alleged virus, a so called in silico genome. At no time is an actual virus confirmed by electron microscopy. At no time is a genome extracted and sequenced from an actual virus. This is scientific fraud. The observation that the unpurified specimen — inoculated onto tissue culture along with toxic antibiotics, bovine fetal tissue, amniotic fluid and other tissues — destroys the kidney tissue onto which it is inoculated is given as evidence of the virus’ existence and pathogenicity. This is scientific fraud. From now on, when anyone gives you a paper that suggests the SARS-CoV-2 virus has been isolated, please check the methods sections. If the researchers used Vero cells or any other culture method, you know that their process was not isolation. You will hear the following excuses for why actual isolation isn’t done: 1. There were not enough virus particles found in samples from patients

to analyze. 2. Viruses are intracellular parasites; they can't be found outside the cell in this manner. people, then on what evidence do we think the virus is dangerous or person to person? We are told it emerges from the cell to infect others. Then why isn't it possible to find it? Finally, questioning these virology techniques and conclusions is not some distraction or divisive issue. Shining the light on this truth is essential to stop this terrible fraud that humanity is confronting. For, as we now know, if the virus has never been isolated, sequenced or shown to cause illness, if the virus is imaginary, then why are we wearing masks, social distancing and putting the whole world into Finally, if pathogenic viruses don't exist, then what is going into those injectable devices erroneously called "vaccines," and what is their purpose? This scientific question is the most urgent and relevant one of our time. We are correct. The SARS-CoV2 virus does not exist. Sally Fallon Morell, MA Dr. Thomas Cowan, MD Dr. Andrew Kaufman, MD Alinsky, Saul: Rules for Radicals (Vintage, 1989) Antelman, Rabbi Marvin: To Eliminate the Opiate (Zahavia, 1974) Bastardi, Joe: The Climate Chronicles (Relentless Thunder Press, 2018) Cowan, Tom: Human Heart, Cosmic Heart (Chelsea Green Publishing, 2016) Cowan, Tom, and Fallon Morell, Sally: The Contagion Myth (Skyhorse Publishing, 2020) Forbes, Jack D: Columbus And Other Cannibals – The Wetiko Disease of Exploitation, Imperialism, and Terrorism (Seven Stories Press, 2008 – originally published in 1979) Gates, Bill: How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need (Allen Lane, 2021) Huxley, Aldous: Brave New World (Châjo & Windus, 1932) Köhnlein, Dr Claus, and Engelbrecht, Torsten: Virus Mania (emu-Verlag, Lahnstein, 2020) Lanza, Robert, and Berman, Bob: Biocentrism (BenBella Books, 2010) Lash, John Lamb: Not In His Image (Chelsea Green Publishing, 2006) Lester, Dawn, and Parker, David: What Really Makes You Ill – Why everything you thought you knew about disease is wrong (Independently Published, 2019) Levy, Paul: Dispelling Wetiko, Breaking the Spell of Evil (North Atlantic Books, 2013) Marx, Karl: A World Without Jews (Philosophical Library, first edition, 1959) Mullis, Kary: Dancing Naked in the Mine Field (Bloomsbury, 1999) O'Brien, Cathy: Trance-Formation of America (Reality Marketing, 1995) Scholem, Gershon: The Messianic Idea in Judaism (Schocken Books, 1994) Schwab,

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Joe ref1, ref2, ref3, ref4, ref5, ref6, ref7, ref8, ref9, ref10, ref11, ref12, ref13, ref14, ref15, ref16, ref17 health professionals ref1, ref2 immunity from prosecution in US ref1 vaccines ref1, ref2, ref3, ref4, ref5, ref6, ref7, ref8 Wetiko factor ref1, ref2 WHO ref1, ref2, ref3 Bill and Melinda Gates Foundation ref1, ref2, ref3, ref4, ref5, ref6, billionaires ref1, ref2, ref3, ref4, ref5, ref6, ref7, ref8, ref9 ref10, ref11 bird flu (H5N1) ref1 Black Lives Matter (BLM) ref1, ref2, ref3, ref4, ref5 Blair, Tony ref1, ref2, ref3, ref4, ref5, ref6, ref7 Brin, Sergei ref1, ref2, ref3, ref4, ref5, ref6, ref7 British Empire ref1 Bush, George HW ref1, ref2 Bush, George W ref1, ref2, ref3, ref4 Byrd, Robert ref1 Global Cult ref1 hate speech ref1 old people ref1 wearable technology ref1 Capitol Hill riot ref1, ref2 agents provocateur ref1 Black Lives Matter (BLM) ref1, ref2 security precautions, lack of ref1, ref2, ref3 carbon dioxide ref1, ref2 care homes, deaths in ref1, ref2 cashless digital money systems ref1 censorship ref1, ref2, ref3, ref4, ref5 media ref1, ref2 private messages ref1 social media ref1, ref2, ref3, ref4, ref5, ref6 transgender persons ref1 vaccines ref1, ref2, ref3 Centers for Disease Control (CDC) (United States) ref1, ref2, ref3, ref4, ref5, ref6, ref7, ref8, ref9, ref10, ref11, ref12, ref13 centralisation ref1, ref2, ref3, ref4, ref5, ref6, ref7, ref8 change agents ref1, ref2, ref3 chemtrails ref1, ref2, ref3 chief medical officers and scientific advisers ref1, ref2, ref3, ref4, children see also young people abuse ref1, ref2, ref3, ref4, ref5, ref6, ref7, ref8, ref9, ref10 care, taken into ref1, ref2, ref3 education ref1, ref2, ref3, ref4 family courts ref1 hand sanitisers ref1 human sacrifice ref1 lockdowns ref1, ref2, ref3 masks ref1, ref2, ref3, ref4, ref5 mental health ref1 old people ref1 parents, replacement of ref1, ref2 Psyop (psychological operation), Covid as a ref1, ref2 smartphone addiction ref1 social distancing and isolation ref1 social media ref1 transgender persons ref1, ref2 United States ref1 vaccines ref1, ref2, ref3, ref4, ref5, ref6, ref7, ref8, ref9, ref10 Wetiko factor ref1 China ref1, ref2, ref3, ref4 anal swab tests ref1 Chinese Revolution ref1, ref2, ref3 digital currency ref1 Global Cult ref1, ref2, ref3, ref4, ref5, ref6, ref7, ref8, ref9 guaranteed income ref1 Imperial College ref1 lockdown ref1, ref2 masculinity crisis ref1 origins of virus in China ref1, ref2, ref3, ref4, ref5 pollution causing respiratory diseases ref1 Sabbatians ref1, ref2 Smart Grid ref1, ref2 social credit system ref1 testing ref1, ref2 United States ref1, ref2

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the times I've been mistaken It's impossible to say And the grass is growing Underneath our feet The words that I remember From my childhood still are true That there's none so blind As those who will not see And to those who lack the courage And say it's dangerous to try Well they just don't know That love eternal will not be denied I know you're out there somewhere I know you're out there somewhere Somewhere you can hear my voice I know I'll find you somehow I know I'll find you somehow And somehow I'll return again to you The Moody Blues Are you a gutless wonder - or a Renegade Mind? Monuments put from pen to paper, Turns me into a gutless wonder, And if you tolerate this, Then your children will be next. Gravity keeps my head down, Or is it maybe shame ... Manic Street Preachers Rise like lions after slumber In unvanquishable number. Shake your chains to earth like dew Which in sleep have fallen on you. Ye are many - they are few. 'I'm thinking' - Oh, but are you? The Pushbacker sting 'Covid': The calculated catastrophe There is no 'virus' Sequence of deceit War on your mind We must have it? So what is it? Who controls the Cult? Cowan-Kaufman-Morell Statement on Virus Isolation 'I'm thinking' - Oh, but are you? French-born philosopher, mathematician and scientist René Descartes became famous for his statement in Latin in the 17th century which translates into English as: 'I think, therefore I am.' On the face of it that is true. Thought reflects perception and perception leads to both behaviour and self-identity. In that sense thinking the only route to perception? Clearly, as we shall see, 'we' are not always the source of 'our' perception, indeed with regard to humanity as a whole this is rarely the case; and thinking is far from the only means of perception. Thought is the village idiot compared with other expressions of consciousness that we all have the potential to access and tap into. This has to be true when we are those other expressions of consciousness which are infinite in nature. We have forgotten this, or, more to the point, been manipulated to These are not just the esoteric musings of the navel. The whole foundation of human control and oppression is control of perception. Once perception is hijacked then so is behaviour which is dictated by perception. Collective perception becomes collective behaviour and collective behaviour is what we call human society. Perception is all and those behind human control know that which is why

perception is the target 24/7 of the psychopathic manipulators that I call the Global Cult. They know that if they dictate perception they will dictate behaviour and collectively dictate the nature of human society. They are further aware that perception is formed from information received and if they control the circulation of information they will to a vast extent direct human behaviour. Censorship of information and opinion has become globally Nazi- like in recent years and never more blatantly than since the illusory 'virus pandemic' was triggered out of China in 2019 and across the world in 2020. Why have billions submitted to house arrest and accepted fascistic societies in a way they would have never believed possible? Those controlling the information spewing from government, mainstream media and Silicon Valley (all controlled by the same Global Cult networks) told them they were in danger from a 'deadly virus' and only by submitting to house arrest and conceding their most basic of freedoms could they and their families be protected. This monumental and provable lie became the perception of the billions and therefore the behaviour of the billions. In those few words you have the whole structure and modus operandi of human control. Fear is a perception – False Emotion Appearing Real – and fear is the currency of control. In short ... get them by the balls (or give them the impression that you have) and their hearts and minds will follow. Nothing grips the dangly bits and freezes the rear-end more comprehensively than fear.

World number 1

There are two 'worlds' in what appears to be one 'world' and the prime difference between them is knowledge. First we have the mass of human society in which the population is maintained in coldly- calculated ignorance through control of information and the 'education' (indoctrination) system. That's all you really need to control to enslave billions in a perceptual delusion in which what are perceived to be their thoughts and opinions are ever-repeated mantras that the system has been downloading all their lives through 'education', media, science, medicine, politics and academia in which the personnel and advocates are themselves overwhelmingly the perceptual products of the same repetition. Teachers and academics in general are processed by the same programming machine as everyone else, but unlike the great majority they never leave the 'education' program. It gripped them as students and

continues to grip them as programmers of subsequent generations of students. The programmed become the programmers – the programmed programmers. The same can largely be said for scientists, doctors and politicians and not least because as the American writer Upton Sinclair said: 'It is difficult to get a man to understand something when his salary depends upon his not understanding it.' If your career and income depend on thinking the way the system demands then you will – bar a few free- minded exceptions – concede your mind to the Perceptual Mainframe that I call the Postage Stamp Consensus. This is a tiny band of perceived knowledge and possibility 'taught' (downloaded) in the schools and universities, pounded out by the mainstream media and on which all government policy is founded. Try thinking, and especially speaking and acting, outside of the 'box' of consensus and see what that does for your career in the Mainstream Everything which bullies, harasses, intimidates and ridicules the population into compliance. Here we have the simple structure which enslaves most of humanity in a perceptual prison cell for an entire lifetime and I'll go deeper into this process shortly. Most of what humanity is taught as fact is nothing more than programmed belief. American science fiction author Frank Herbert was right when he said: 'Belief can be manipulated. Only knowledge is dangerous.' In the 'Covid' age belief is promoted and knowledge is censored. It was always so, but never to the extreme of today. World number 2 of every day. World number 2 is a global network of secret societies and semi-secret groups dictating the direction of society via governments, corporations and authorities of every kind. I have spent more than 30 years uncovering and exposing this network that I call the Global Cult and knowing its agenda is what has made my books so accurate in predicting current and past events. Secret societies are secret for a reason. They want to keep their hoarded knowledge to themselves and their chosen initiates and to hide it from the population which they seek through ignorance to control and subdue. The whole foundation of the division between World 1 and World 2 is knowledge. What number 1 knows number 2 must not. Knowledge they have worked so hard to keep secret includes (a) the agenda to enslave humanity in a centrally-controlled global dictatorship, and (b) the nature of reality and

life itself. The lajêr (b) must be suppressed to allow the former (a) to prevail as I shall be explaining. The way the Cult manipulates and interacts with the population can be likened to a spider's web. The 'spider' sits at the centre in the shadows and imposes its will through the web with each strand represented in World number 2 by a secret society, satanic or semi-secret group, and in World number 1 – the world of the seen – by governments, agencies of government, law enforcement, corporations, the banking system, media conglomerates and Silicon Valley (Fig 1 overleaf). The spider and the web connect and coordinate all these organisations to pursue the same global outcome while the population sees them as individual entities working randomly and independently. At the level of the web governments are the banking system are the corporations are the media are Silicon Valley are the World Health Organization working from their inner cores as one unit. Apparently unconnected countries, corporations, institutions, organisations and people are on the same team pursuing the same global outcome. Strands in the web immediately around the spider are the most secretive and exclusive secret societies and their membership is emphatically restricted to the Cult inner-circle emerging through the generations from particular bloodlines for reasons I will come to. At the core of the core you would get them in a single room. That's how many people are dictating the direction of human society and its transformation through the 'Covid' hoax and other means. As the web expands out from the spider we meet the secret societies that many people will be aware of – the Freemasons, Knights Templar, Knights of Malta, Opus Dei, the inner sanctum of the Jesuit Order, and such like. Note how many are connected to the Church of Rome and there is a reason for that. The Roman Church was established as a revamp, a rebranding, of the relocated 'Church' of Babylon and the Cult imposing global tyranny today can be tracked back to Babylon and Sumer in what is Figure 1: The global web through which the few control the many. (Image Neil Hague.) Inner levels of the web operate in the unseen away from the public eye and then we have what I call the cusp organisations located at the point where the hidden meets the seen. They include a series of satellite organisations answering to a secret society founded in London in the late 19th century called

the Round Table and among them are the Royal Institute of International Affairs (UK, founded in 1920); Council on Foreign Relations (US, 1921); Bilderberg Group (worldwide, 1954); Trilateral Commission (US/worldwide, 1972); and the Club of Rome (worldwide, 1968) which was created to exploit environmental concerns to justify the centralisation of global power to 'save the planet'. The Club of Rome instigated with others the human-caused climate change hoax which has led to all the 'green new deals' demanding that very centralisation of control. Cusp organisations, which include endless 'think tanks' all over the world, are designed to coordinate a single global policy between political and business leaders, intelligence personnel, media organisations and anyone who can influence the direction of policy in their own sphere of operation. Major players and regular attendees will know what is happening – or some of it – while others come and go and are kept overwhelmingly in the dark about the big picture. I refer to these cusp groupings as semi-secret in that they can be publicly identified, but what goes on at the inner-core is kept very much 'in house' even from most of their members and participants through a fiercely-imposed system of compartmentalisation. Only let them know what they need to know to serve your interests and no more. The structure of secret societies serves as a perfect example of this principle. Most Freemasons never get higher than the bottom three levels of 'degree' (degree of knowledge) when there are 33 official degrees of the Scottish Rite. Initiates only qualify for the next higher 'compartment' or degree if those at that level choose to allow them. Knowledge can be carefully assigned only to those considered 'safe'. I went to my local Freemason's lodge a few years ago when they were having an 'open day' to show how cuddly they were and when I chatted to some of them I was astonished at how little the rank and file knew even about the most ubiquitous symbols they use. The mushroom technique – keep them in the dark and feed them bullshit – applies to most people in the web as well as the population as a whole. Sub-divisions of the web mirror in theme and structure transnational corporations which have a headquarters somewhere in the world dictating to all their subsidiaries in different countries. Subsidiaries operate in their methodology and branding to the same centrally-dictated plan and policy in

pursuit of particular ends. The Cult web functions in the same way. Each country has its own web as a subsidiary of the global one. They consist of networks of secret societies, semi-secret groups and bloodline families and their job is to impose the will of the spider and the global web in their particular country. Subsidiary networks control and manipulate the national political system, finance, corporations, media, medicine, etc. to ensure that they follow the globally-dictated Cult agenda. These networks were the means through which the 'Covid' hoax could be played out with almost every country responding in the same way. The 'Yessir' pyramid Compartmentalisation is the key to understanding how a tiny few can dictate the lives of billions when combined with a top-down sequence of imposition and acquiescence. The inner core of the Cult sits at the peak of the pyramidal hierarchy of human society (Fig 2 overleaf). It imposes its will – its agenda for the world – on the level immediately below which acquiesces to that imposition. This level then imposes the Cult will on the level below them which acquiesces and imposes on the next level. Very quickly we meet levels in the hierarchy that have no idea there even is a Cult, but the sequence of imposition and acquiescence continues down the pyramid in just the form "on-high" and so we be!er just do it.' Alfred Lord Tennyson said of the cannon fodder levels in his poem The Charge of the Light Brigade: 'Theirs not to reason why; theirs but to do and die.' The next line says that 'into the valley of death rode the six hundred' and they died because they obeyed without question what their perceived 'superiors' told them to do. In the same way the population capitulated to 'Covid'. The whole hierarchical pyramid functions like this to allow the very few to direct the enormous many. Eventually imposition-acquiescence-imposition-acquiescence comes down to the mass of the population at the foot of the pyramid. If they acquiesce to those levels of the hierarchy imposing on them (governments/law enforcement/doctors/media) a circuit is completed between the population and the handful of super- psychopaths in the Cult inner core at the top of the pyramid. Without a circuit-breaking refusal to obey, the sequence of imposition and acquiescence allows a staggeringly few people to impose their will upon the entirety of humankind. We are looking at the very sequence that has subjugated billions since the start of

2020. Our freedom has not been taken from us. Humanity has given it away. Fascists do not impose fascism because there are not enough of them. Fascism is imposed by the population acquiescing to fascism. Put another way allowing their perceptions to be programmed to the extent that leads to the population giving their freedom away by giving their perceptions – their mind – away. If this circuit is not broken by humanity ceasing to cooperate with their own enslavement then nothing can change. For that to happen people have to critically think and see through the lies and window dressing and then summon the backbone to act upon what they see. The Cult spends its days working to stop either happening and its methodology is systematic and highly detailed, but it can be overcome and that is what this book is all about.

Figure 2: The simple sequence of imposition and compliance that allows a handful of people at the peak of the pyramid to dictate the lives of billions. The Life Program Okay, back to world number 1 or the world of the 'masses'. Observe the process of what we call 'life' and it is a perceptual download from cradle to grave. The Cult has created a global structure in which perception can be programmed and the program continually topped-up with what appears to be constant confirmation that the program is indeed true reality. The important word here is 'appears'. This is the structure, the fly-trap, the Postage Stamp Consensus or Perceptual Mainframe, which represents that incredibly narrow band of perceived possibility delivered by the 'education' system, mainstream media, science and medicine. From the earliest age the download begins with parents who have themselves succumbed to the very programming their children are about to go through. Most parents don't do this out of malevolence and mostly it is quite the opposite. They do what they believe is best for their children and that is what the program has told them is best. Within three or four years comes the major transition from parental programming to full-blown state (Cult) programming in school, college and university where perceptually-programmed teachers and academics pass on their programming to the next generations. Teachers who resist are soon marginalised and their careers ended while children who resist are called a problem child for whom Ritalin may need to be prescribed. A few years after entering the 'world' children are under the control of



authority figures representing the state telling them when they have to be there, when they can leave and when they can speak, eat, even go to the toilet. This is calculated preparation for a lifetime of obeying authority in all its forms. Reflex-action fear of authority is instilled by authority from the start. Children soon learn the carrot and stick consequences of obeying or defying authority which is underpinned daily for the rest of their life. Fortunately I daydreamed through this crap and never obeyed authority simply because it told me to. This approach to my alleged 'bejers' continues to this day. There can be consequences of pursuing open-minded freedom in a world of closed-minded conformity. I spent a lot of time in school corridors after being ejected from the classroom for not taking some of it seriously and now I spend a lot of time being ejected from Facebook, YouTube and Twitter. But I can tell you that being true to yourself and not compromising your self-respect is far more exhilarating than bowing to authority for authority's sake. You don't have to be a sheep to the shepherd (authority) and the sheep dog (fear of not obeying authority). The perceptual download continues throughout the formative years in school, college and university while script-reading 'teachers', 'academics' 'scientists', 'doctors' and 'journalists' insist that ongoing generations must be as programmed as they are. Accept the program or you will not pass your 'exams' which confirm your 'degree' of programming. It is tragic to think that many parents pressure their offspring to work hard at school to download the program and qualify for the next stage at college and university. The late, great, American comedian George Carlin said: 'Here's a bumper sticker I'd like to see: We are proud parents of a child who has resisted his teachers' attempts to break his spirit and bend him to the will of his corporate masters.' Well, the best of luck finding many of those, George. Then comes the moment to leave the formal programming years in academia and enter the 'adult' world of work. There you meet others in your chosen or prescribed arena who went through the same Postage Stamp Consensus program before you did. There is therefore overwhelming agreement between almost everyone on the basic foundations of Postage Stamp reality and the rejection, even contempt, of the few who have a mind of their own and are prepared to use it. This has two

major effects. Firstly, the consensus confirms to the programmed that their download is really how things are. I mean, everyone knows that, right? Secondly, the arrogance and ignorance of Postage Stamp adherents ensure that anyone questioning the program will have unpleasant consequences for seeking their own truth and not picking their perceptions from the shelf marked: 'Things you must believe without question and if you don't you're a dangerous lunatic conspiracy theorist and a Every government, agency and corporation is founded on the same Postage Stamp prison cell and you can see why so many people believe the same thing while calling it their own 'opinion'. Fusion of governments and corporations in pursuit of the same agenda was the definition of fascism described by Italian dictator Benito Mussolini. The pressure to conform to perceptual norms downloaded for a lifetime is incessant and infiltrates society right down to family groups that become censors and condemners of their own 'black sheep' for not, ironically, being sheep. We have seen an explosion of that in the 'Covid' era. Cult-owned global media unleashes its propaganda all day every day in support of the Postage Stamp and targets with abuse and ridicule anyone in the public eye who won't bend their mind to the will of the tyranny. Any response to this is denied (certainly in my case). They don't want to give a platform to expose official lies. Cult-owned-and-created Internet giants like Facebook, Google, YouTube and Twiŕer delete you for having an unapproved opinion. Facebook boasts that its AI censors delete 97-percent of 'hate speech' before anyone even reports it. Much of that 'hate speech' will simply be an opinion that Facebook and its masters don't want people to see. Such perceptual oppression is widely known as fascism. Even Facebook executive Benny Thomas, a 'CEO Global Planning Lead', said in comments secretly recorded by investigative journalism operation Project Veritas that Facebook is 'too powerful' and should be broken up: I mean, no king in history has been the ruler of two billion people, but Mark Zuckerberg is ... And he's 36. That's too much for a 36-year-old ... You should not have power over two billion people. I just think that's wrong. Thomas said Facebook-owned platforms like Instagram, Oculus, and WhatsApp needed to be separate companies. 'It's too much power when they're all one together'. That's the way the Cult likes it, however. We have

an executive of a Cult organisation in Benny Thomas that doesn't know there is a Cult such is the compartmentalisation. Thomas said that Facebook and Google 'are no longer companies, they're countries'. Actually they are more powerful than countries on the basis that if you control information you control perception and control human society. I love my oppressor

Another expression of this psychological trickery is for those who realise they are being pressured into compliance to eventually convince themselves to believe the official narratives to protect their self-respect from accepting the truth that they have succumbed to meek and subservient compliance. Such people become some of the most vehement defenders of the system. You can see them everywhere screaming abuse at those who prefer to think for capitulation to conformity. 'You are talking dangerous nonsense you Covidiot!!' Are you trying to convince me or yourself? It is a potent form of Stockholm syndrome which is defined as: 'A psychological condition that occurs when a victim of abuse identifies and attaches, or bonds, positively with their abuser.' An example is hostages bonding and even 'falling in love' with their kidnappers. The syndrome has been observed in domestic violence, abused children, concentration camp inmates, prisoners of war and many and various Satanic cults. These are some traits of Stockholm syndrome listed at Positive regard towards perpetrators of abuse or captor [see Failure to cooperate with police and other government authorities when it comes to holding perpetrators of abuse or kidnapping accountable [or in the case of 'Covid' cooperating with the police to enforce and defend their captors' demands]. Little or no effort to escape [see 'Covid']. Belief in the goodness of the perpetrators or kidnappers [see Appeasement of captors. This is a manipulative strategy for maintaining one's safety. As victims get rewarded – perhaps with less abuse or even with life itself – their appeasing behaviours are reinforced [see 'Covid']. Learned helplessness. This can be akin to 'if you can't beat 'em, join 'em'. As the victims fail to escape the abuse or captivity, they may start giving up and soon realize it's just easier for everyone if they acquiesce all their power to their captors [see 'Covid']. Feelings of pity toward the abusers, believing they are actually victims themselves. Because of this, victims may go on a crusade or mission to 'save' [protect] their

abuser [see the venom unleashed on those challenging the official 'Covid' narrative]. Unwillingness to learn to detach from their perpetrators and heal. In essence, victims may tend to be less loyal to themselves than to their abuser [ definitely see 'Covid']. Ponder on those traits and compare them with the behaviour of great swathes of the global population who have defended governments and authorities which have spent every minute destroying their lives and livelihoods and those of their children and grandchildren since early 2020 with fascistic lockdowns, house arrest and employment deletion to 'protect' them from a 'deadly virus' that their abusers' perceptually created to bring about this very outcome. We are looking at mass Stockholm syndrome. All those that agree to concede their freedom will believe those perceptions are originating in their own independent 'mind' when in fact by conceding their reality to Stockholm syndrome they have by definition conceded any independence of mind. Listen to the 'opinions' of the acquiescing masses in this 'Covid' era and what gushes forth is the repetition of the official version of everything delivered unprocessed, unfiltered and unquestioned. The whole programming dynamic works this way. I must be free because I'm told that I am and so I think that I am. You can see what I mean with the chapter theme of 'I'm thinking – Oh, but are you?' The great majority are not thinking, let alone for themselves. They are repeating what authority has told them to believe which allows them to be controlled. Weaving through this mentality is the fear that the 'conspiracy theorists' are right and this again explains the often hysterical abuse that ensues when you dare to contest the official narrative of anything. Denial is the mechanism of hiding from yourself what you don't want to be true. Telling people what they want to hear is easy, but it's an infinitely greater challenge to tell them what they would rather not be happening. One is akin to pushing against an open door while the other is met with vehement resistance no matter what the scale of evidence. I don't want it to be true so I'll convince myself that it's not. Examples are everywhere from the denial that a partner is cheating despite all the signs to the reflex-action rejection of any idea that world events in which country after country act in exactly the same way are centrally coordinated. To accept the latter is to accept that a force of unspeakable evil is working to

destroy your life and the lives of your children with nothing too horrific to achieve that end. Who the heck wants that to be true? But if we don't face reality the end is duly achieved and the consequences are far worse and ongoing than breaking through the walls of denial today with the courage to make a stand against tyranny. Connect the dots – but how? A crucial aspect of perceptual programming is to portray a world in which everything is random and almost nothing is connected to anything else. Randomness cannot be coordinated by its very nature and once you perceive events as random the idea they could be connected is waved away as the rantings of the tinfoil-hat brigade. You can't plan and coordinate random you idiot! No, you can't, but you can hide the coldly-calculated and long-planned behind the illusion of randomness. A foundation manifestation of the Renegade Mind is to scan reality for patterns that connect the apparently random and turn pixels and dots into pictures. This is the way I work and have done so for more than 30 years. You look for similarities in people, modus operandi and desired outcomes and slowly, then ever quicker, the picture forms. For instance: There would seem to be no connection between the 'Covid pandemic' hoax and the human-caused global-warming hoax and yet they are masks (appropriately) on the same face seeking the same outcome. Those pushing the global warming myth through the Club of Rome and other Cult agencies are driving the lies about 'Covid' – Bill Gates is an obvious one, but they are endless. Why would the same people be involved in both when they are clearly not connected? Oh, but they are. Common themes with personnel are matched by common goals. The 'solutions' to both 'problems' are centralisation of global power to impose the will of the few on the many to 'save' humanity from 'Covid' and save the planet from an 'existential threat' (we need 'zero Covid' and 'zero carbon emissions'). These, in turn, connect with the 'dot' of globalisation which was coined to describe the centralisation of global power in every area of life through incessant political and corporate expansion, trading blocks and superstates like the European Union. If you are the few and you want to control the many you have to centralise power and decision-making. The more you centralise power the more power the few at the centre will have over the many; and the more that power is centralised the more

power those at the centre have to centralise even quicker. The momentum of centralisation gets faster and faster which is exactly the process we have witnessed. In this way the hoaxed 'pandemic' and the fakery of human-caused global warming serve the interests of globalisation and the seizure of global power in the hands of the Cult inner-circle which is behind 'Covid', 'climate change' and globalisation. At this point random 'dots' become a clear and obvious picture or pattern. Klaus Schwab, the classic Bond villain who founded the Cult's Gates-funded World Economic Forum, published a book in 2020, *The Great Reset*, in which he used the 'problem' of 'Covid' to justify a total transformation of human society to 'save' humanity from 'climate change'. Schwab said: 'The pandemic represents a rare but narrow window of opportunity to reflect, reimagine, and reset our world.' What he didn't mention is that the Cult he serves is behind both hoaxes as I show in my book *The Answer*. He and the Cult don't have to reimagine the world. They know precisely what they want and that's why they destroyed human society with 'Covid' to 'build back better' in their grand design. Their job is not to imagine, but to get humanity to imagine and agree with their plans while believing it's all random. It must be pure coincidence that 'The Great Reset' has long been the Cult's code name for the global imposition of fascism and replaced previous code-names of the 'New World Order' used by Cult frontmen like Father George Bush and the 'New Order of the Ages' which emerged from Freemasonry and much older secret societies. New Order of the Ages appears on the reverse of the Great Seal of the United States as 'Novus ordo seclorum' underneath the Cult symbol used since way back of the pyramid and all seeing-eye (Fig 3). The pyramid is the hierarchy of human control headed by the illuminated eye that symbolises the force behind the Cult which I will expose in later chapters. The term 'Annuity Coeptis' translates as 'He favours our undertaking'. We are told the 'He' is the Christian god, but 'He' is not as I will be explaining. Figure 3: The all-seeing eye of the Cult 'god' on the Freemason-designed Great Seal of the United States and also on the dollar bill. Having you on Two major Cult techniques of perceptual manipulation that relate to all this are what I have called since the 1990s Problem-Reaction- Solution (PRS) and the Totalitarian Tiptoe (TT). They can be uncovered by

the inquiring mind with a simple question: Who benefits? The answer usually identifies the perpetrators of a given action or happening through the concept of 'he who most benefits from a crime is the one most likely to have committed it'. The Latin 'Cui bono?' – Who benefits? – is widely attributed to the Roman orator and statesman Marcus Tullius Cicero. No wonder it goes back so far when the concept has been relevant to human behaviour since history was recorded. Problem-Reaction-Solution is the technique used to manipulate us every day by covertly creating a problem (or the illusion of one) and offering the solution to the problem (or the illusion of one). In the first phase you create the problem and blame someone or something else for why it has happened. This may relate to a financial collapse, terrorist attack, war, global warming or pandemic, anything in fact that will allow you to impose the 'solution' to change society in the way you desire at that time. The 'problem' doesn't have to be real. PRS is manipulation of perception and all you need is the population to believe the problem is real. Human-caused global warming and the 'Covid pandemic' only have to be perceived to be real for the population to accept the 'solutions' of authority. I refer to this technique as NO-Problem-Reaction-Solution. Billions did not meekly accept house arrest from early 2020 because there was a real deadly 'Covid pandemic' but because they perceived – believed – that to be the case. The antidote to Problem- Reaction-Solution is to ask who benefits from the proposed solution. Invariably it will be anyone who wants to justify more control through deletion of freedom and centralisation of power and The two world wars were Problem-Reaction-Solutions that transformed and realigned global society. Both were manipulated into being by the Cult as I have detailed in books since the mid- 1990s. They dramatically centralised global power, especially World War Two, which led to the United Nations and other global bodies thanks to the overt and covert manipulations of the Rockefeller family and other Cult bloodlines like the Rothschilds. The UN is a stalking horse for full-blown world government that I will come to shortly. The land on which the UN building stands in New York was donated by the Rockefellers and the same Cult family was behind Big Pharma scalpel and drug 'medicine' and the creation of the World Health Organization as part

of the UN. They have been stalwarts of the eugenics movement and funded Hitler's race-purity expert' Ernst Rudin. The human-caused global warming hoax has been orchestrated by the Club of Rome through the UN which is manufacturing both the 'problem' through its Intergovernmental Panel on Climate Change and imposing the 'solution' through its Agenda 21 and Agenda 2030 which demand the total centralisation of global power to 'save the world' from a climate hoax the United Nations is itself perpetrating. What a small world the Cult can be seen to be particularly among the inner circles. The bedfellow of Problem-Reaction-Solution is the Totalitarian Tiptoe which became the Totalitarian Sprint in 2020. The technique is fashioned to hide the carefully-coordinated behind the cover of apparently random events. You start the sequence at 'A' and you know you are heading for 'Z'. You don't want people to know that and each step on the journey is presented as a random happening while all the steps strung together lead in the same direction. The speed may have quickened dramatically in recent times, but you can still see the incremental approach of the Tiptoe in the case of 'Covid' as each new imposition takes us deeper into fascism. Tell people they have to do this or that to get back to 'normal', then this and this and this. With each new demand adding to the ones that went before the population's freedom is deleted until it disappears. The spider wraps its web around the flies more comprehensively with each new diktat. I'll highlight this in more detail when I get to the 'Covid' hoax and how it has been pulled off. Another prime example of the Totalitarian Tiptoe is how the Cult-created European Union went from a 'free-trade zone' to a centralised bureaucratic dictatorship through the Tiptoe of incremental centralisation of power until nations became mere administrative units for Cult-owned dark suits in Brussels. The antidote to ignorance is knowledge which the Cult seeks vehemently to deny us, but despite the systematic censorship to that end the Renegade Mind can overcome this by vociferously seeking out the facts no matter the impediments put in the way. There is also a method of thinking and perceiving – knowing – that doesn't even need names, dates, place-type facts to identify the patterns that reveal the story. I'll get to that in the final chapter. All you need to know about the manipulation of human society and to what end is still out



there – at the time of writing – in the form of books, videos and websites for those that really want to breach the walls of programmed perception. To access this knowledge requires the abandonment of the mainstream media as a source of information in the awareness that this is owned and controlled by the Cult and therefore promotes mass perceptions that suit the Cult. Mainstream media lies all day, every day. That is its function and very reason for being. Where it does tell the truth, here and there, is only because the truth and the Cult agenda very occasionally coincide. If you look for fact and insight to the BBC, CNN and virtually all the rest of them you are asking to be conned and perceptually programmed. Know the outcome and you'll see the journey Events seem random when you have no idea where the world is being taken. Once you do the random becomes the carefully planned. Know the outcome and you'll see the journey is a phrase I have been using for a long time to give context to daily happenings that appear unconnected. Does a problem, or illusion of a problem, trigger a proposed 'solution' that further drives society in the direction of the outcome? Invariably the answer will be yes and the random – abracadabra – becomes the clearly coordinated. So what is this outcome that unlocks the door to a massively expanded understanding of daily events? I will summarise its major aspects – the fine detail is in my other books – and those new to this information will see that the world they thought they were living in is a very different place. The foundation of the Cult agenda is the incessant centralisation of power and all such centralisation is ultimately in pursuit of Cult control on a global level. I have described for a long time the planned world structure of top-down dictatorship as the Hunger Games Society. The term obviously comes from the movie series which portrayed a world in which a few living in military-protected hi-tech luxury were the overlords of a population condemned to abject poverty in isolated 'sectors' that were not allowed to interact. 'Covid' lockdowns and travel bans anyone? The 'Hunger Games' pyramid of structural control has the inner circle of the Cult at the top with préjy much the entire population at the bojom under their control through dependency for survival on the Cult. The whole structure is planned to be protected and enforced by a military-police state (Fig 4). Here you have the reason for the global lockdowns

of the fake pandemic to coldly destroy independent incomes and livelihoods and make everyone dependent on the 'state' (the Cult that controls the 'states'). I have warned in my books for many years about the plan to introduce a 'guaranteed income' – a barely survivable pittance – designed to impose dependency when employment was destroyed by AI technology and now even more comprehensively at great speed by the 'Covid' scam. Once the pandemic was played and lockdown consequences began to delete independent income the authorities began to talk right on cue about the need for a guaranteed income and a 'Great Reset'. Guaranteed income will be presented as benevolent governments seeking to help a desperate people – desperate as a direct result of actions of the same governments. The truth is that such payments are a trap. You will only get them if you do exactly what the authorities demand including mass vaccination (genetic manipulation). We have seen this theme already in Australia where those dependent on government benefits have them reduced if parents don't agree to have their children vaccinated according to an insane health-destroying government-dictated schedule. Calculated economic collapse applies to governments as well as people. The Cult wants rid of countries through the creation of a world state with countries broken up into regions ruled by a world government and super states like the European Union. Countries must be bankrupted, too, to this end and it's being achieved by the trillions in 'rescue packages' and furlough payments, trillions in lost taxation, and money-no-object spending on 'Covid' including constant all-medium advertising (programming) which has made the media dependent on government for much of its income. The day of reckoning is coming – as planned – for government spending and given that it has been made possible by printing money and not by production/taxation there is inflation on the way that has the potential to wipe out monetary value. In that case there will be no need for the Cult to steal your money. It just won't be worth anything (see the German Weimar Republic before the Nazis took over). Many have been okay with lockdowns while getting a percentage of their income from so-called furlough payments without having to work. Those payments are dependent, however, on people having at least a theoretical job with a business considered

non-essential and ordered to close. As these business go under because they are closed by lockdown after lockdown the furlough stops and it will for everyone eventually. Then what? The 'then what?' is precisely the idea. Figure 4: The Hunger Games Society structure I have long warned was planned and now the 'Covid' hoax has made it possible. This is the real reason for lockdowns. Between the Hunger Games Cult elite and the dependent population is planned to be a vicious military-police state (a fusion of the two into one force). This has been in the making for a long time with police looking ever more like the military and carrying weapons to match. The pandemic scam has seen this process accelerate so fast as lockdown house arrest is brutally enforced by carefully recruited fascist minds and gormless system-servers. The police and military are planned to merge into a centrally-directed world army in a global structure headed by a world government which wouldn't be elected even by the election fixes now in place. The world army is not planned even to be human and instead wars would be fought, primarily against the population, using robot technology controlled by artificial intelligence. I have been warning about this for decades and now militaries around the world are being transformed by this very AI technology. The global regime that I describe is a particular form of fascism known as a technocracy in which decisions are not made by clueless and co-opted politicians but by unelected technocrats – scientists, engineers, technologists and bureaucrats. Cult-owned-and-controlled Silicon Valley giants are examples of technocracy and they already have far more power to direct world events than governments. They are with their censorship selecting governments. I know that some are calling the 'Great Reset' a Marxist communist takeover, but fascism and Marxism are different labels for the same tyranny. Tell those who lived in fascist Germany and Stalinist Russia that there was a difference in the way their freedom was deleted and their lives controlled. I could call it a fascist technocracy or a Marxist technocracy and they would be equally accurate. The Hunger Games society with its world government structure would oversee a world army, world central bank and single world cashless currency imposing its will on a microchipped population (Fig 5). Scan its different elements and see how the illusory pandemic is forcing

society in this very direction at great speed. Leaders of 23 countries and the World Health Organization (WHO) backed the idea in March, 2021, of a global treaty for 'international cooperation' in 'health emergencies' and nations should 'come together as a global community for peaceful cooperation that extends beyond this crisis'. Cut the Orwellian bullshit and this means another step towards global government. The plan includes a cashless digital money system that I first warned about in 1993. Right at the start of 'Covid' the deeply corrupt Tedros Adhanom Ghebreyesus, the crooked and merely gofer 'head' of the World Health Organization, said it was possible to catch the 'virus' by touching cash and it was better to use cashless means. The claim was ridiculous nonsense and like the whole 'Covid' mind-trick it was nothing to do with 'health' and everything to do with pushing every aspect of the Cult agenda. As a result of the Tedros lie the use of cash has plummeted. The Cult script involves a single world digital currency that would eventually be technologically embedded in the body. China is a massive global centre for the Cult and if you watch what is happening there you will know what is planned for everywhere. The Chinese government is developing a digital currency which would allow fines to be deducted immediately via AI for anyone caught on camera breaking its fantastic list of laws and the money is going to be programmable with an expiry date to ensure that no one can accrue wealth except the Cult and its

Figure 5: The structure of global control the Cult has been working towards for so long and this has been enormously advanced by the 'Covid' illusion. Serfdom is so smart The Cult plan is far wider, extreme, and more comprehensive than even most conspiracy researchers appreciate and I will come to the true depths of deceit and control in the chapters 'Who controls the Cult?' and 'Escaping Wetiko'. Even the world that we know is crazy enough. We are being deluged with ever more sophisticated and controlling technology under the heading of 'smart'. We have smart televisions, smart meters, smart cards, smart cars, smart driving, smart roads, smart pills, smart patches, smart watches, smart skin, smart borders, smart pavements, smart streets, smart cities, smart communities, smart environments, smart growth, smart planet ... smart everything around us. Smart technologies and methods of operation are designed to interlock

to create a global Smart Grid connecting the entirety of human society including human minds to create a centrally-dictated 'hive' mind. 'Smart cities' is code for densely-occupied megacities of total surveillance and control through AI. Ever more destructive frequency communication systems like 5G have been rolled out without any official testing for health and psychological effects (colossal). 5G/6G/7G systems are needed to run the Smart Grid and each one becomes more destructive of body and mind. Deleting independent income is crucial to forcing people into these AI-policed prisons by ending private property ownership (except for the Cult elite). The Cult's Great Reset now openly foresees a global society in which no one will own any possessions and everything will be rented while the Cult would own literally everything under the guise of government and corporations. The aim has been to use the lockdowns to destroy sources of income on a mass scale and when the people are destitute and in unrepayable amounts of debt (problem) Cult assets come forward with the pledge to write-off debt in return for handing over all property and possessions (solution). Everything – literally everything including people – would be connected to the Internet via AI. I was warning years ago about the coming Internet of Things (IoT) in which all devices and technology from your car to your fridge would be plugged into the Internet and controlled by AI. Now we are already there with much more to come. The next stage is the Internet of Everything (IoE) which is planned to include the connection of AI to the human brain and body to replace the human mind with a centrally-controlled AI mind. Instead of perceptions being manipulated through control of information and censorship those perceptions would come direct from the Cult through AI. What do you think? You think whatever AI decides that you think. In human terms there would be no individual 'think' any longer. Too incredible? The ravings of a lunatic? Not at all. Cult-owned crazies in Silicon Valley have been telling us the plan for years without explaining the real motivation and calculated implications. These include Google executive and 'futurist' Ray Kurzweil who highlights the year 2030 for when this would be underway. He said: Our thinking ... will be a hybrid of biological and non-biological thinking ... humans will be able to extend their limitations and 'think in the cloud' ... We're going to put gateways to the

cloud in our brains ... We're going to gradually merge and enhance ourselves ... In my view, that's the nature of being human – we transcend our limitations. As the technology becomes vastly superior to what we are then the small proportion that is still human gets smaller and smaller and smaller until it's just utterly negligible. The sales-pitch of Kurzweil and Cult-owned Silicon Valley is that this would make us 'super-human' when the real aim is to make us post-human and no longer 'human' in the sense that we have come to know. The entire global population would be connected to AI and become the centrally-controlled 'hive-mind' of externally-delivered perceptions. The Smart Grid being installed to impose the Cult's will on the world is being constructed to allow particular locations – even one location – to control the whole global system. From these prime control centres, which absolutely include China and Israel, anything connected to the Internet would be switched on or off and manipulated at will. Energy systems could be cut, communication via the Internet taken down, computer-controlled driverless autonomous vehicles driven off the road, medical devices switched off, the potential is limitless given how much AI and Internet connections now run human society. We have seen nothing yet if we allow this to continue. Autonomous vehicle makers are working with law enforcement to produce cars designed to automatically pull over if they detect a police or emergency vehicle flashing from up to 100 feet away. At a police stop the car would be unlocked and the window rolled down automatically. Vehicles would only take you where the computer (the state) allowed. The end of petrol vehicles and speed limiters on all new cars in the UK and EU from 2022 are steps leading to electric computerised transport over which ultimately you have no control. The picture is far bigger even than the Cult global network or web and that will become clear when I get to the nature of the 'spider'. There is a connection between all these happenings and the instigation of DNA-manipulating 'vaccines' (which aren't 'vaccines') justified by the 'Covid' hoax. That connection is the unfolding plan to transform the human body from a biological to a synthetic biological state and this is why synthetic biology is such a fast-emerging discipline of mainstream science. 'Covid vaccines' are infusing self-replicating synthetic genetic material into the cells to cumulatively

take us on the Totalitarian Tiptoe from Human 1.0 to the synthetic biological Human 2.0 which will be physically and perceptually attached to the Smart Grid to one hundred percent control every thought, perception and deed. Humanity needs to wake up and fast. This is the barest explanation of where the 'outcome' is planned to go but it's enough to see the journey happening all around us. Those new to this information will already see 'Covid' in a whole new context. I will add much more detail as we go along, but for the minutiae evidence see my mega-works, The Answer, The Trigger and Everything You Need to Know But Have Never Been Told. Now – how does a Renegade Mind see the 'world'? It is one thing to be clever and another to be wise George R.R. Martin simple definition of the difference between a programmed mind and a Renegade Mind would be that one sees only dots while the other connects them to see the picture. Reading reality with accuracy requires the observer to (a) know the planned outcome and (b) realise that everything, but everything, is connected. The entirety of infinite reality is connected – that's its very nature – and with human society an expression of infinite reality the same must apply. Simple cause and effect is a connection. The effect is triggered by the cause and the effect then becomes the cause of another effect. Nothing happens in isolation because it can't. Life in whatever reality is simple choice and consequence. We make choices and these lead to consequences. If we don't like the consequences we can make different choices and get different consequences which lead to other choices and consequences. The choice and the consequence are not only connected they are indivisible. You can't have one without the other as an old song goes. A few cannot control the world unless those being controlled allow that to happen – cause and effect, choice and consequence. Control – who has it and who doesn't – is a two-way process, a symbiotic relationship, involving the controller and controlled. 'They took my freedom away!!' Well, yes, but you also gave it to them. Humanity is subjected to mass control because humanity has acquiesced to that control. This is all cause and effect and literally a case of give and take. In the same way world events of every kind are connected and the Cult works incessantly to sell the illusion of the random and coincidental to maintain the essential (to them) perception of

dots that hide the picture. Renegade Minds know this and constantly scan the world for patterns of connection. This is absolutely pivotal in understanding the happenings in the world and without that perspective clarity is impossible. First you know the planned outcome and then you identify the steps on the journey – the day-by-day apparently random which, when connected in relation to the outcome, no longer appear as individual events, but as the proverbial chain of events leading in the same direction. I'll give you Political puppet show We are told to believe that politics is 'adversarial' in that different parties with different beliefs engage in an endless tussle for power. There may have been some truth in that up to a point – and only a point – but today divisions between 'different' parties are rhetorical not ideological. Even the rhetorical is fusing into one-speak as the parties eject any remaining free thinkers while others succumb to the ever-gathering intimidation of anyone with the 'wrong' opinion. The Cult is not a new phenomenon and can be traced back thousands of years as my books have documented. Its intergenerational initiates have been manipulating events with increasing effect the more that global power has been centralised. In ancient times the Cult secured control through the system of monarchy in which 'special' bloodlines (of which more later) demanded the right to rule as kings and queens simply by birthright and by vanquishing others who claimed the same birthright. There came a time, however, when people had matured enough to see the unfairness of such tyranny and demanded a say in who governed them. Note the word – governed them. Not served them – governed them, hence government defined as 'the political direction and control exercised over the actions of the members, citizens, or inhabitants of communities, societies, and states; direction of the affairs of a state, community, etc.' Governments exercise control over rather than serve just like the monarchies before them. Bizarrely there are still countries like the United Kingdom which are ruled by a monarch and a government that officially answers to the monarch. The UK head of state and that of Commonwealth countries such as Canada, Australia and New Zealand is 'selected' by who in a single family had unprotected sex with whom and in what order. Pinch me it can't be true. Ouch! Shit, it is. The demise of monarchies in most countries offered a potential vacuum



in which some form of free and fair society could arise and the Cult had that base covered. Monarchies had served its interests but they couldn't continue in the face of such widespread opposition and, anyway, replacing a 'royal' dictatorship that people could see with a dictatorship 'of the people' hiding behind the concept of 'democracy' presented far greater manipulative possibilities and ways of hiding coordinated tyranny behind the illusion of 'freedom'. Democracy is quite wrongly defined as government selected by the population. This is not the case at all. It is government selected by some of the population (and then only in theory). This 'some' doesn't even have to be the majority as we have seen so often in first-past-the-post elections in which the so-called majority party wins fewer votes than the 'losing' parties combined. Democracy can give total power to a party in government from a minority of the votes cast. It's a sleight of hand to sell tyranny as freedom. Seventy-four million Trump-supporting Americans didn't vote for the 'Democratic' Party of Joe Biden in the distinctly dodgy election in 2020 and yet far from acknowledging the wishes and feelings of that great percentage of American society the Cult-owned Biden government set out from day one to destroy them and their right to a voice and opinion. Empty shell Biden and his Cult handlers said lunacy and sickness to which politics has descended. Connect the dots and relate them to the desired outcome – a world government run by self-appointed technocrats and no longer even elected politicians. While operating through its political agents in government the Cult is at the same time encouraging public disdain for politicians by putting idiots and incompetents in theoretical power on the road to deleting them. The idea is to instil a public reaction that says of the technocrats: 'Well, they couldn't do any worse than the pathetic politicians.' It's all about controlling perception and Renegade Minds can see through that while programmed minds cannot when they are ignorant of both the planned outcome and the manipulation techniques employed to secure that end. This knowledge can be learned, however, and fast if people choose to get informed. Politics may at first sight appear very difficult to control from a central point. I mean look at the 'different' parties and how would you be able to oversee them all and their constituent parts? In truth, it's very

straightforward because of their structure. We are back to the pyramid of imposition and acquiescence. Organisations are structured in the same way as the system as a whole. Political parties are not open forums of free expression. They are hierarchies. I was a national spokesman for the British Green Party which claimed to be a different kind of politics in which influence and power was devolved; but I can tell you from direct experience – and it's far worse now – that Green parties are run as hierarchies like all the others however much they may try to hide that fact or kid themselves that it's not true. A very few at the top of all political parties are directing policy and personnel. They decide if you are elevated in the party or serve as a government minister and to do that you have to be a yes man or woman. Look at all the maverick political thinkers who never ascended the greasy pole. If you want to progress within the party or reach 'high-office' you need to fall into line and conform. Exceptions to this are rare indeed. Should you want to run for parliament or Congress you have to persuade the local or state level of the party to select you and for that you need to play the game as dictated by the hierarchy. If you secure election and wish to progress within the greater structure you need to go on conforming to what is acceptable to those running the hierarchy from the peak of the pyramid. Political parties are perceptual gulags and the very fact that there are party 'Whips' appointed to 'whip' politicians into voting the way the hierarchy demands exposes the ridiculous idea that politicians are elected to serve the people they are supposed to represent. Cult operatives and manipulation has long seized control of major parties that have any chance of forming a government and at least most of those that haven't. A new party forms and the Cult goes to work to infiltrate and direct. This has reached such a level today that you see video compilations of 'leaders' of all parties whether Democrats, Republicans, Conservative, Labour and Green parroting the same Cult mantra of 'Build Back Bejêr' and the 'Great Reset' which are straight off the Cult song-sheet to describe the transformation of global society in response to the Cult-instigated hoaxes of the 'Covid pandemic' and human-caused 'climate change'. To see Caroline Lucas, the Green Party MP that I knew when I was in the party in the 1980s, speaking in support of plans proposed by Cult operative Klaus

Schwab representing the billionaire global elite is a real head-shaker. Many parties – one master The party system is another mind-trick and was instigated to change the nature of the dictatorship by swapping 'royalty' for dark suits that people believed – though now ever less so – represented their interests. Understanding this trick is to realise that a single force (the Cult) controls all parties either directly in terms of the major ones or through manipulation of perception and ideology with others. You don't need to manipulate Green parties to demand your transformation of society in the name of 'climate change' when they are obsessed with the lie that this is essential to 'save the planet'. You just give them a platform and away they go serving your interests while believing they are being environmentally virtuous. America's political structure is a perfect blueprint for how the two or multi- party system is really a one-party state. The Republican Party is controlled from one step back in the shadows by a group made up of billionaires and their gofers known as neoconservatives or Neocons. I have exposed them in fine detail in my books and they were the driving force behind the policies of the imbecilic presidency of Boy George Bush which included 9/11 (see The Trigger for a comprehensive demolition of the official story), the subsequent 'war on terror' (war of terror) and the invasions of Afghanistan and Iraq. The laîcher was a No-Problem-Reaction-Solution based on claims by Cult operatives, including Bush and British Prime Minister Tony Blair, about Saddam Hussein's 'weapons of mass destruction' which did not exist as war criminals Bush and Blair well knew. Figure 6: Different front people, different parties – same control system. The Democratic Party has its own 'Neocon' group controlling from the background which I call the 'Democons' and here's the penny-drop – the Neocons and Democons answer to the same masters one step further back into the shadows (Fig 6). At that level of the Cult the Republican and Democrat parties are controlled by the same people and no maîcher which is in power the Cult is in power. This is how it works in almost every country and certainly in Britain with Conservative, Labour, Liberal Democrat and Green parties now all on the same page whatever the rhetoric may be in their feeble aîtempts to appear different. Neocons operated at the time of Bush through a think tank called The Project for the New American

Century which in September, 2000, published a document entitled Rebuilding America's Defenses: Strategies, Forces, and Resources For a New Century demanding that America fight 'multiple, simultaneous major theatre wars' as a 'core mission' to force regime- change in countries including Iraq, Libya and Syria. Neocons arranged for Bush ('Republican') and Blair ('Labour Party') to front- up the invasion of Iraq and when they departed the Democons orchestrated the targeting of Libya and Syria through Barack Obama ('Democrat') and British Prime Minister David Cameron ('Conservative Party'). We have 'different' parties and 'different' people, but the same unfolding script. The more the Cult has seized the reigns of parties and personnel the more their policies have transparently pursued the same agenda to the point where the fascist 'Covid' impositions of the Conservative junta of Jackboot Johnson in Britain were opposed by the Labour Party because they were not fascist enough. The Labour Party is likened to the US Democrats while the Conservative Party is akin to a British version of the Republicans and on both sides of the Atlantic they all speak the same language and support the direction demanded by the Cult although some more enthusiastically than others. It's a similar story in country after country because it's all centrally controlled. Oh, but what about Trump? I'll come to him shortly. Political 'choice' in the 'party' system goes like this: You vote for Party A and they get into government. You don't like what they do so next time you vote for Party B and they get into government. You don't like what they do when it's pretty much the same as Party A and why wouldn't that be with both controlled by the same force? Given that only two, sometimes three, parties have any chance of forming a government to get rid of Party B that you don't like you have to vote again for Party A which ... you don't like. This, ladies and gentlemen, is what they call 'democracy' which we are told - wrongly - is a term interchangeable with 'freedom'. The cult of cults At this point I need to introduce a major expression of the Global Cult known as Sabbatian-Frankism. Sabbatian is also spelt as Sabbatean. I will summarise here. I have published major exposés and detailed background in other works. Sabbatian-Frankism combines the names of two frauds posing as 'Jewish' men, Sabbatai Zevi (1626-1676), a rabbi, black magician and occultist who proclaimed he was the

Jewish messiah; and Jacob Frank (1726-1791), the Polish 'Jew', black magician and occultist who said he was the reincarnation of 'messiah' Zevi and biblical patriarch Jacob. They worked across two centuries to establish the Sabbatian-Frankist cult that plays a major, indeed central, role in the manipulation of human society by the Global Cult which has its origins much further back in history than Sabbatai Zevi. I should emphasise two points here in response to the shrill voices that will scream 'anti-Semitism': (1) Sabbatian-Frankists are NOT Jewish and only pose as such to hide their cult behind a Jewish façade; and (2) my information about this cult has come from Jewish sources who have long realised that their society and community has been infiltrated and taken over by interloper Sabbatian-Frankists. Infiltration has been the foundation technique of Sabbatian-Frankism from its official origin in the 17th century. Zevi's Sabbatian sect attracted a massive following described as the biggest messianic movement in Jewish history, spreading as far as Africa and Asia, and he promised a return for the Jews to the 'Promised Land' of Israel. Sabbatianism was not Judaism but an inversion of everything that mainstream Judaism stood for. So much so that this sinister cult would have a feast day when Judaism had a fast day and whatever was forbidden in Judaism the Sabbatians were encouraged and even commanded to do. This included incest and what would be today called Satanism. Members were forbidden to marry outside the sect and there was a system of keeping their children ignorant of what they were part of until they were old enough to be trusted not to unknowingly reveal anything to outsiders. The same system is employed to this day by the Global Cult in general which Sabbatian-Frankism has enormously influenced and now largely controls. Zevi and his Sabbatians suffered a setback with the intervention by the Sultan of the Islamic Ottoman Empire in the Middle East and what is now the Republic of Turkey where Zevi was located. The Sultan gave him the choice of proving his 'divinity', converting to Islam or facing torture and death. Funnily enough Zevi chose to convert or at least appear to. Some of his supporters were disillusioned and drifted away, but many did not with 300 families also converting – only in theory – to Islam. They continued behind this Islamic smokescreen to follow the goals, rules and rituals of Sabbatianism and became known

as 'crypto-Jews' or the 'Dönme' which means 'to turn'. This is rather ironic because they didn't 'turn' and instead hid behind a fake Islamic persona. The process of appearing to be one thing while being very much another would become the calling card of Sabbatianism especially after Zevi's death and the arrival of the Satanist Jacob Frank in the 18th century when the cult became Sabbatian-Frankism and plumbed still new depths of depravity and infiltration which included – still includes – human sacrifice and sex with children. Wherever Sabbatians go paedophilia and Satanism follow and is it really a surprise that Hollywood is so infested with child abuse and Satanism when it was established by Sabbatian-Frankists and is still controlled by them? Hollywood has been one of the prime vehicles for global perceptual programming and manipulation. How many believe the version of 'history' portrayed in movies when it is a travesty and inversion (again) of the truth? Rabbi Marvin Antelman describes Frankism in his book, *To Eliminate the Opiate*, as 'a movement of complete evil' while Jewish professor Gershom Scholem said of Frank in *The Messianic Idea in Judaism*: 'In all his actions [he was] a truly corrupt and degenerate individual ... one of the most frightening phenomena in the whole of Jewish history.' Frank was excommunicated by traditional rabbis, as was Zevi, but Frank was undeterred and enjoyed vital support from the House of Rothschild, the infamous banking dynasty whose inner-core are Sabbatian-Frankists and not Jews. Infiltration of the Roman Church and Vatican was instigated by Frank with many Dönme 'turning' again to convert to Roman Catholicism with a view to hijacking the reins of power. This was the ever-repeating modus operandi and continues to be so. Pose as an advocate of the religion, culture or country that you want to control and then manipulate your people into the positions of authority and influence largely as advisers, administrators and Svengalis for those that appear to be in power. They did this with Judaism, Christianity (Christian Zionism is part of this), Islam and other religions and nations until Sabbatian-Frankism spanned the world as it does Sabbatian Saudis and the terror network. One expression of the Sabbatian-Frankist Dönme within Islam is the ruling family of Saudi Arabia, the House of Saud, through which came the vile distortion of Islam known as Wahhabism. This is the violent creed followed by

terrorist groups like Al-Qaeda and ISIS or Islamic State. Wahhabism is the hand-chopping, head-chopping 'religion' of Saudi Arabia which is used to keep the people in a constant state of fear so the interloper House of Saud can continue to rule. Al-Qaeda and Islamic State were lavishly funded by the House of Saud while being created and directed by the Sabbatian-Frankist network in the United States that operates through the Pentagon, CIA and the government in general of whichever 'party'. The front man for the establishment of Wahhabism in the middle of the 18th century was a Sabbatian-Frankist 'crypto-Jew' posing as Islamic called Muhammad ibn Abd al-Wahhab. His daughter would marry the son of Muhammad bin Saud who established the first Saudi state before his death in 1765 with support from the British Empire. Bin Saud's successors would establish modern Saudi Arabia in league with the British and Americans in 1932 which allowed them to seize control of Islam's major shrines in Mecca and Medina. They have dictated the direction of Sunni Islam ever since while Iran is the major centre of the Shiite version and here we have the source of at least the public conflict between them. The Sabbatian network has used its Wahhabi extremists to carry out Problem-Reaction-Solution terrorist aĵacks in the name of 'Al-Qaeda' and 'Islamic State' to justify a devastating 'war on terror', ever-increasing surveillance of the population and to terrify people into compliance. Another insight of the Renegade Mind is the streetwise understanding that just because a country, location or people are aĵacked doesn't mean that those apparently representing that country, location or people are not behind the aĵackers. Oĝen they are orchestrating the aĵacks because of the societal changes that can be then justified in the name of 'saving the population from terrorists'. I show in great detail in The Trigger how Sabbatian-Frankists were the real perpetrators of 9/11 and not '19 Arab hijackers' who were blamed for what happened. Observe what was justified in the name of 9/11 alone in terms of Middle East invasions, mass surveillance and control that fulfilled the demands of the Project for the New American Century document published by the Sabbatian Neocons. What appear to be enemies are on the deep inside players on the same Sabbatian team. Israel and Arab 'royal' dictatorships are all ruled by Sabbatians and the recent peace

agreements between Israel and Saudi Arabia, the United Arab Emirates (UAE) and others are only making formal what has always been the case behind the scenes. Palestinians who have been subjected to grotesque tyranny since Israel was bombed and terrorised into existence in 1948 have never stood a chance. Sabbatian-Frankists have controlled Israel (so the constant theme of violence and war which Sabbatians love) and they have controlled the Arab countries that Palestinians have looked to for real support that never comes. 'Royal families' of the Arab world in Saudi Arabia, Bahrain, UAE, etc., are all Sabbatians with allegiance to the aims of the cult and not what is best for their Arabic populations. They have stolen the oil and financial resources from their people by false claims to be 'royal dynasties' with a genetic right to rule and by employing vicious militaries to impose The Satanist Jacob Frank formed an alliance in 1773 with two other Sabbatians, Mayer Amschel Rothschild (1744-1812), founder of the Rothschild banking dynasty, and Jesuit-educated fraudulent Jew, Adam Weishaupt, and this led to the formation of the Bavarian Illuminati, firstly under another name, in 1776. The Illuminati would be the manipulating force behind the French Revolution (1789-1799) and was also involved in the American Revolution (1775-1783) before and after the Illuminati's official creation. Weishaupt would later become (in public) a Protestant Christian in archetypal Sabbatian style. I read that his name can be decoded as Adam-Weis- haupt or 'the first man to lead those who know'. He wasn't a leader in the sense that he was a subordinate, but he did lead those below him in a crusade of transforming human society that still continues today. The theme was confirmed as early as 1785 when a horseman courier called Lanz was reported to be struck by lightning and extensive Illuminati documents were found in his saddlebags. They made the link to Weishaupt and detailed the plan for world takeover. Current events with 'Covid' fascism have been in the making for a very long time. Jacob Frank was jailed for 13 years by the Catholic Inquisition after his arrest in 1760 and on his release he headed for Frankfurt, Germany, home city and headquarters of the House of Rothschild where the alliance was struck with Mayer Amschel Rothschild and Weishaupt. Rothschild arranged for Frank to be given the title of Baron and he became a wealthy nobleman with a big following of



Jews in Germany, the Austro-Hungarian Empire and other European countries. Most of them would have believed he was on their side. The name 'Illuminati' came from the Zohar which is a body of works in the Jewish mystical 'bible' called the Kabbalah. 'Zohar' is the foundation of Sabbatian-Frankist belief and in Hebrew 'Zohar' means 'splendour', 'radiance', 'illuminated', and so we have 'Illuminati'. They claim to be the 'Illuminated Ones' from their knowledge systematically hidden from the human population and passed on through generations of carefully-chosen initiates in the global secret society network or Cult. Hidden knowledge includes an awareness of the Cult agenda for the world and the nature of our collective reality that I will explore later. Cult 'illumination' is symbolised by the torch held by the Statue of Liberty which was giŒed to New York by French Freemasons in Paris who knew exactly what it represents. 'Liberty' symbolises the goddess worshipped in Babylon as Queen Semiramis or Ishtar. The significance of this will become clear. Notice again the ubiquitous theme of inversion with the Statue of 'Liberty' really symbolising mass control (Fig 7). A mirror-image statute stands on an island in the River Seine in Paris from where New York Liberty originated (Fig 8). A large replica of the Liberty flame stands on top of the Pont de l'Alma tunnel in Paris where Princess Diana died in a Cult ritual described in The Biggest Secret. Lucifer 'the light bringer' is related to all this (and much more as we'll see) and 'Lucifer' is a central figure in Sabbatian-Frankism and its associated Satanism. Sabbatians reject the Jewish Torah, or Pentateuch, the 'five books of Moses' in the Old Testament known as Genesis, Exodus, Leviticus, Numbers, and Deuteronomy which are claimed by Judaism and Christianity to have been dictated by 'God' to Moses on Mount Sinai. Sabbatians say these do not apply to them and they seek to replace them with the Zohar to absorb Judaism and its followers into their inversion which is an expression of a much greater global inversion. They want to delete all religions and force humanity to worship a one-world religion – Sabbatian Satanism that also includes worship of the Earth goddess. Satanic themes are being more and more introduced into mainstream society and while Christianity is currently the foremost target for destruction the others are planned to follow. Figure 7: The Cult goddess of Babylon disguised as the

Statue of Liberty holding the flame of Lucifer the 'light bringer'. Figure 8: Liberty's mirror image in Paris where the New York version originated. Rabbi Marvin Antelman connects the Illuminati to the Jacobins in To Eliminate the Opiate and Jacobins were the force behind the French Revolution. He links both to the Bund der Gerechten, or League of the Just, which was the network that inflicted communism/Marxism on the world. Antelman wrote: The original inner circle of the Bund der Gerechten consisted of born Catholics, Protestants and Jews [Sabbatian-Frankist infiltrators], and those representatives of respective subdivisions formulated schemes for the ultimate destruction of their faiths. The heretical Catholics laid plans which they felt would take a century or more for the ultimate destruction of the church; the apostate Jews for the ultimate destruction of the Jewish religion. Sabbatian-created communism connects into this anti-religion agenda in that communism does not allow for the free practice of religion. The Sabbatian 'Bund' became the International Communist Party and Communist League and in 1848 'Marxism' was born with the Communist Manifesto of Sabbatian assets Karl Marx and Friedrich Engels. It is absolutely no coincidence that Marxism, just a different name for fascist and other centrally-controlled tyrannies, is being imposed worldwide as a result of the 'Covid' hoax and nor that Marxist/fascist China was the place where the hoax originated. The reason for this will become very clear in the chapter 'Covid: The calculated catastrophe'. The so-called 'Woke' mentality has hijacked traditional beliefs of the political left and replaced them with far-right make-believe 'social justice' better known as Marxism. Woke will, however, be swallowed by its own perceived 'revolution' which is really the work of billionaires and billionaire corporations feigning being 'Woke'. Marxism is being touted by Wokers as a replacement for 'capitalism' when we don't have 'capitalism'. We have cartelism in which the market is stitched up by the very same billionaires and corporations bankrolling Woke. Billionaires love Marxism which keeps the people in servitude while they control from the top. Terminally naïve Wokers think they are 'changing the world' when their vital part and become surplus to requirements they, too, will be targeted. The Illuminati-Jacobins were behind the period known as 'The Terror' in the French Revolution in

1793 and 1794 when Jacobin Maximillan de Robespierre and his Orwellian 'Commîjée of Public Safety' killed 17,000 'enemies of the Revolution' who had once been 'friends of the Revolution'. Karl Marx (1818-1883), whose Sabbatian creed of Marxism has cost the lives of at least 100 million people, is a hero once again to Wokers who have been systematically kept ignorant of real history by their 'education' programming. As a result they now promote a Sabbatian 'Marxist' abomination destined at some point to consume them. Rabbi Antelman, who spent decades researching the Sabbatian plot, said of the League of the Just and Contrary to popular opinion Karl Marx did not originate the Communist Manifesto. He was paid for his services by the League of the Just, which was known in its country of origin, Germany, as the Bund der Geaehteten. Antelman said the text aîributed to Marx was the work of other people and Marx 'was only repeating what others already said'. Marx was 'a hired hack – lackey of the wealthy Illuminists'. Marx famously said that religion was the 'opium of the people' (part of the Sabbatian plan to demonise religion) and Antelman called his books, To Eliminate the Opiate. Marx was born Jewish, but his family converted to Christianity (Sabbatian modus operandi) and he so he supported the Sabbatian plan to destroy traditional Jewishness and Judaism which we are clearly seeing today with the vindictive targeting of orthodox Jews by the Sabbatian government of Israel over 'Covid' laws. I don't follow any religion and it has done much damage to the world over centuries and acted as a perceptual straightjacket. Renegade Minds, however, are always asking why something is being done. It doesn't maîjer if they agree or disagree with what is happening – why is it happening is the question. The 'why?' can be answered with regard to religion in that religions create interacting communities of believers when the Cult wants to dismantle all discourse, unity and interaction (see 'Covid' lockdowns) and the ultimate goal is to delete all religions for a one- world religion of Cult Satanism worshipping their 'god' of which more later. We see the same 'why?' with gun control in America. I don't have guns and don't want them, but why is the Cult seeking to disarm the population at the same time that law enforcement agencies are armed to their molars and why has every tyrant in history sought to disarm people before launching the final takeover?

They include Hitler, Stalin, Pol Pot and Mao who followed confiscation with violent seizing of power. You know it's a Cult agenda by the people who immediately race to the microphones to exploit dead people in multiple shootings. Ultra-Zionist Cult lackey Senator Chuck Schumer was straight on the case after ten people were killed in Boulder, Colorado in March, 2021. Simple rule ... if Schumer wants it the Cult wants it and the same with his ultra-Zionist mate the wild-eyed Senator Adam Schiff. At the same time they were calling for the disarmament of Americans, many of whom live a long way from a police response, Schumer, Schiff and the rest of these pampered clowns were sitting on Capitol Hill behind a razor-wired security fence protected by thousands of armed troops in addition to their own armed bodyguards. Mom and pop in an isolated home? They're just potential mass shooters. Sabbatian-Frankists and most importantly the Rothschilds were behind the creation of 'Zionism', a political movement that demanded a Jewish homeland in Israel as promised by Sabbatai Zevi. The very symbol of Israel comes from the German meaning of the name Rothschild. Dynasty founder Mayer Amschel Rothschild changed the family name from Bauer to Rothschild, or 'Red-Shield' in German, in deference to the six-pointed 'Star of David' hexagram displayed on the family's home in Frankfurt. The symbol later appeared on the flag of Israel after the Rothschilds were centrally involved in its creation. Hexagrams are not a uniquely Jewish symbol and are widely used in occult ('hidden') networks often as a symbol for Saturn (see my other books for why). Neither are Zionism and Jewishness interchangeable. Zionism is a political movement and philosophy and not a 'race' or a people. Many Jews oppose Zionism and many non-Jews, including US President Joe Biden, call themselves Zionists as does Israel-centric Donald Trump. America's support for the Israel government is pretty much a gimme with ultra-Zionist billionaires and corporations providing fantastic and dominant funding for both political parties. Former Congresswoman Cynthia McKinney has told how she was approached immediately she ran for office to 'sign the pledge' to Israel and confirm that she would always vote in that country's best interests. All American politicians are approached in this way. Anyone who refuses will get no support or funding from the enormous and all-powerful

Zionist lobby that includes organisations like mega-lobby group AIPAC, the American Israel Public Affairs Commiĵee. Trump's biggest funder was ultra-Zionist casino and media billionaire Sheldon Adelson while major funders of the Democratic Party include ultra-Zionist George Soros and ultra- Zionist financial and media mogul, Haim Saban. Some may reel back at the suggestion that Soros is an Israel-firster (Sabbatian-controlled Israel-firster), but Renegade Minds watch the actions not the words and everywhere Soros donates his billions the Sabbatian agenda benefits. In the spirit of Sabbatian inversion Soros pledged \$1 billion for a new university network to promote 'liberal values and tackle intolerance'. He made the announcement during his annual speech at the Cult-owned World Economic Forum in Davos, Switzerland, in January, 2020, aĝer his 'harsh criticism' of 'authoritarian rulers' around the world. You can only laugh at such brazen mendacity. How he doesn't laugh is the mystery. Translated from the Orwellian 'liberal values and tackle intolerance' means teaching non-white people to hate white people and for white people to loathe themselves for being born white. The reason for that will become The 'Anti-Semitism' fraud Zionists support the Jewish homeland in the land of Palestine which has been the Sabbatian-Rothschild goal for so long, but not for the benefit of Jews. Sabbatians and their global Anti-Semitism Industry have skewed public and political opinion to equate opposing the violent extremes of Zionism to be a blanket aĵack and condemnation of all Jewish people. Sabbatians and their global Anti-Semitism Industry have skewed public and political opinion to equate opposing the violent extremes of Zionism to be a blanket aĵack and condemnation of all Jewish people. This is nothing more than a Sabbatian protection racket to stop legitimate investigation and exposure of their agendas and activities. The official definition of 'anti-Semitism' has more recently been expanded to include criticism of Zionism – a political movement – and this was done to further stop exposure of Sabbatian infiltrators who created Zionism as we know it today in the 19th century. Renegade Minds will talk about these subjects when they know the shit that will come their way. People must decide if they want to know the truth or just cower in the corner in fear of what others will say. Sabbatians have been trying to label me as

'anti-Semitic' since the 1990s as I have uncovered more and more about their background and agendas. Useless, gutless, fraudulent 'journalists' then just repeat the smears without question and on the day I was writing this section a pair of unquestioning repeaters called Ben Quinn and Archie Bland (how appropriate) outright called me an 'anti-Semite' in the establishment propaganda sheet, the London Guardian, with no supporting evidence. The Sabbatian Anti-Semitism Industry said so and who are they to question that? They wouldn't dare. Ironically 'Semitic' refers to a group of languages in the Middle East that are almost entirely Arabic. 'Anti-Semitism' becomes 'anti-Arab' which if the consequences of this misunderstanding were not so grave would be hilarious. Don't bother telling Quinn and Bland. I don't want to confuse them, bless 'em. One reason I am dubbed 'anti-Semitic' is that I wrote in the 1990s that Jewish operatives (Sabbatians) were heavily involved in the Russian Revolution when Sabbatians overthrew the Romanov dynasty. This apparently made me 'anti-Semitic'. Oh, really? Here is a section from The Trigger: British journalist Robert Wilton confirmed these themes in his 1920 book The Last Days of the Romanovs when he studied official documents from the Russian government to identify the members of the Bolshevik ruling elite between 1917 and 1919. The Central Committee included 41 Jews among 62 members; the Council of the People's Commissars had 17 Jews out of 22 members; and 458 of the 556 most important Bolshevik positions between 1918 and 1919 were occupied by Jewish people. Only 17 were Russian. Then there were the 23 Jews among the 36 members of the vicious Cheka Soviet secret police established in 1917 who would soon appear all across the country. Professor Robert Service of Oxford University, an expert on 20th century Russian history, found evidence that ['Jewish'] Leon Trotsky had sought to make sure that Jews were enrolled in the Red Army and were disproportionately represented in the Soviet civil bureaucracy that included the Cheka which performed mass arrests, imprisonment and executions of 'enemies of the people'. A US State Department Decimal File (861.00/5339) dated November 13th, 1918, names [Rothschild banking agent in America] Jacob Schiff and a list of ultra-Zionists as funders of the Russian Revolution leading to claims of a 'Jewish plot', but the

key point missed by all is they were not 'Jews' – they were Sabbatian-Frankists. Britain's Winston Churchill made the same error by mistake or otherwise. He wrote in a 1920 edition of the Illustrated Sunday Herald that those behind the Russian revolution were part of a 'worldwide conspiracy for the overthrow of civilisation and for the reconstitution of society on the basis of arrested development, of envious malevolence, and impossible equality' (see 'Woke' today because that has been created by the same network). Churchill said there was no need to exaggerate the part played in the creation of Bolshevism and in the actual bringing about of the Russian Revolution 'by these international and for the most part atheistical Jews' ['atheistical Jews' = Sabbatians]. Churchill said it is certainly a very great one and probably outweighs all others: 'With the notable exception of Lenin, the majority of the leading figures are Jews.' He went on to describe, knowingly or not, the Sabbatian modus operandi of placing puppet leaders nominally in power while they control from the background: Moreover, the principal inspiration and driving power comes from the Jewish leaders. Thus Tchitcherin, a pure Russian, is eclipsed by his nominal subordinate, Litvinoff, and the influence of Russians like Bukharin or Lunacharski cannot be compared with the power of Trotsky, or of Zinovieff, the Dictator of the Red Citadel (Petrograd), or of Krassin or Radek – all Jews. In the Soviet institutions the predominance of Jews is even more astonishing. And the prominent, if not indeed the principal, part in the system of terrorism applied by the Extraordinary Commissions for Combatting Counter-Revolution has been taken by Jews, and in some notable cases by Jewesses. What I said about seriously disproportionate involvement in the Russian Revolution by Jewish 'revolutionaries' (Sabbatians) is provable fact, but truth is no defence against the Sabbatian Anti- Semitism Industry, its repeater parrots like Quinn and Bland, and the now breathtaking network of so-called 'Woke' 'anti-hate' groups with interlocking leaderships and funding which have the role of discrediting and silencing anyone who gets too close to exposing the Sabbatians. We have seen 'truth is no defence' confirmed in legal judgements with the Saskatchewan Human Rights Commission in Canada decreeing this: 'Truthful statements can be presented in a manner that would meet the definition of hate

speech, and not all truthful statements must be free from restriction.' Most 'anti-hate' activists, who are themselves consumed by hatred, are too stupid and ignorant of the world to know how they are being used. They are far too far up their own virtue-signalling arses and it's far too dark for them to see anything. The 'revolution' game The background and methods of the 'Russian' Revolution are straight from the Sabbatian playbook seen in the French Revolution and endless others around the world that appear to start as a revolution of the people against tyrannical rule and end up with a regime change to more tyrannical rule overtly or covertly. Wars, terror attacks and regime overthrows follow the Sabbatian cult through history with its agents creating them as Problem-Reaction- Solutions to remove opposition on the road to world domination. Sabbatian dots connect the Rothschilds with the Illuminati, Jacobins of the French Revolution, the 'Bund' or League of the Just, the International Communist Party, Communist League and the Communist Manifesto of Karl Marx and Friedrich Engels that would lead to the Rothschild-funded Russian Revolution. The sequence comes under the heading of 'creative destruction' when you advance to your global goal by continually destroying the status quo to install a new status quo which you then also destroy. The two world wars come to mind. With each new status quo you move closer to your planned outcome. Wars and mass murder are to Sabbatians a collective blood sacrifice ritual. They are obsessed with death for many reasons and one is that death is an inversion of life. Satanists and Sabbatians are obsessed with death and often target churches and churchyards for their rituals. Inversion-obsessed Sabbatians explain the use of inverted symbolism including the inverted pentagram and inverted cross. The inversion of the cross has been related to targeting Christianity, but the cross was a religious symbol long before Christianity and its inversion is a statement about the Sabbatian mentality and goals more than any single religion. Sabbatians operating in Germany were behind the rise of the occult-obsessed Nazis and the subsequent Jewish exodus from Germany and Europe to Palestine and the United States after World War Two. The Rothschild dynasty was at the forefront of this both as political manipulators and by funding the operation. Why would Sabbatians help to



orchestrate the horrors inflicted on Jews by the Nazis and by Stalin after they organised the Russian Revolution? Sabbatians hate Jews and their religion, that's why. They pose as Jews and secure positions of control within Jewish society and play the 'anti-Semitism' card to protect themselves from exposure through a global network of organisations answering to the Sabbatian-created-and-controlled globe-spanning intelligence network that involves a stunning web of military-intelligence operatives and operations for a tiny country of just nine million. Among them are Jewish assets who are not Sabbatians but have been and the Jewish community to protect them from what they have been programmed since childhood to believe is a Jew-hating hostile world. The Jewish community is just a highly convenient cover to hide the true nature of Sabbatians. Anyone getting close to exposing their game is accused by Sabbatian place-people and gofers of 'anti-Semitism' and claiming that all Jews are part of a plot to take over the world. I am not saying that. I am saying that Sabbatians – the real Jew-haters – have infiltrated the Jewish community to use them both as a cover and an 'anti-Semitic' defence against exposure. Thus we have the Anti-Semitism Industry targeted researchers in this way and most Jewish people think this is justified and genuine. They don't know that their 'Jewish' leaders and institutions of state, intelligence and military are not controlled by Jews at all, but cultists and stooges of Sabbatian-Frankism. I once added my name to a pro-Jewish freedom petition online and the next time I looked my name was gone and text had been added to the petition blurb to attack me as an 'anti-Semite' such is the scale of perceptual programming. Moving on America I tell the story in The Trigger and a chapter called 'Atlantic Crossing' how particularly after Israel was established the Sabbatians moved in on the United States and eventually grasped control of government administration, the political system via both Democrats and Republicans, the intelligence community like the CIA and National Security Agency (NSA), the Pentagon and mass media. Through this seriously compartmentalised network Sabbatians and their operatives in Mossad, Israeli Defense Forces (IDF) and US agencies pulled off 9/11 and blamed it on 19 'Al-Qaeda hijackers' dominated by men from, or connected to, Sabbatian-ruled Saudi Arabia. The '19' were not even on the planes

let alone flew those big passenger jets into buildings while being largely incompetent at piloting one-engine light aircraft. 'Hijacker' Hani Hanjour who is said to have flown American Airlines Flight 77 into the Pentagon with a turn and manoeuvre most professional pilots said they would have struggled to do was banned from renting a small plane by instructors at the Freeway Airport in Bowie, Maryland, just six weeks earlier on the grounds that he was an incompetent pilot. The Jewish population of the world is just 0.2 percent with even that almost entirely concentrated in Israel (75 percent Jewish) and the United States (around two percent). This two percent and globally 0.2 percent refers to Jewish people and not Sabbatian interlopers who are a fraction of that fraction. What a sobering thought when you think of the fantastic influence on world affairs of tiny Israel and that the Project for the New American Century (PNAC) which laid out the blueprint in September, 2000, for America's war on terror and regime change wars in Iraq, Libya and Syria was founded and dominated by Sabbatians known as 'Neocons'. The document conceded that this plan would not be supported politically or publicly without a major attack on American soil and a Problem-Reaction-Solution excuse to send troops to war across the Middle East. Sabbatian Neocons said: ... [The] process of transformation ... [war and regime change] ... is likely to be a long one, absent some catastrophic and catalysing event – like a new Pearl Harbor. Four months later many of those who produced that document came to power with their inane puppet George Bush from the long-time Sabbatian Bush family. They included Sabbatian Dick Cheney who was officially vice-president, but really de-facto president for the entirety of the 'Bush' government. Nine months after the 'Bush' inauguration came what Bush called at the time 'the Pearl Harbor of the 21st century' and with typical Sabbatian timing and symbolism 2001 was the 60th anniversary of the attack in 1941 by the Japanese Air Force on Pearl Harbor, Hawaii, which allowed President Franklin Delano Roosevelt to take the United States into a Sabbatian-instigated Second World War that he said in his election campaign that he never would. The evidence is overwhelming that Roosevelt and his military and intelligence networks knew the attack was coming and did nothing to stop it, but they did make sure that America's most

essential naval ships were not in Hawaii at the time. Three thousand Americans died in the Pearl Harbor attacks as they did on September 11th. By the year of 2001 Sabbatians had widely infiltrated the US government, military and intelligence operations and used their compartmentalised assets to pull off the 'Al-Qaeda' attacks. If you read The Trigger it will blow your mind to see the utterly staggering concentration of 'Jewish' operatives (Sabbatian infiltrators) in essential positions of political, security, legal, law enforcement, financial and business power before, during, and after the attacks to make them happen, carry them out, and then cover their tracks – and I do mean staggering when you think of that 0.2 percent of the world population and two percent of Americans which are Jewish while Sabbatian infiltrators are a fraction of that. A central foundation of the 9/11 conspiracy was the hijacking of government, military, Air Force and intelligence computer systems in real time through 'back-door' access made possible by Israeli (Sabbatian) 'cyber security' software. Sabbatian-controlled Israel is on the way to rivalling Silicon Valley for domination of cyberspace and is becoming the dominant force in cyber-security which gives them access to entire computer systems and their passcodes across the world. Then add to this that Zionists head (officially) Silicon Valley giants like Google (Larry Page and Sergey Brin), Google-owned YouTube (Susan Wojcicki), Facebook (Mark Zuckerberg and Sheryl Sandberg), and Apple (Chairman Arthur D. Levinson), and that ultra-Zionist hedge fund billionaire Paul Singer has a \$1 billion stake in Twitter which is only nominally headed by 'CEO' pothead Jack Dorsey. As cable news host Tucker Carlson said of Dorsey: 'There used to be debate in the medical community whether dropping a ton of acid had permanent effects and I think that debate has now ended.' Carlson made the comment after Dorsey told a hearing on Capitol Hill (if you cut through his bullshit) that he believed in free speech so long as he got to decide what you can hear and see. These 'big names' of Silicon Valley are only front men and women for the Global Cult, not least the Sabbatians, who are the true controllers of these corporations. Does anyone still wonder why these same people and companies have been ferociously censoring and banning people (like me) for exposing any aspect of the Cult agenda and especially the truth

about the 'Covid' hoax which Sabbatians have orchestrated? The Jeffrey Epstein paedophile ring was a Sabbatian operation. He was officially 'Jewish' but he was a Sabbatian and women abused by the ring have told me about the high number of 'Jewish' people involved. The Epstein horror has Sabbatian wriĳen all over it and matches perfectly their modus operandi and obsession with sex and ritual. Epstein was running a Sabbatian blackmail ring in which famous people with political and other influence were provided with young girls for sex while everything was being filmed and recorded on hidden cameras and microphones at his New York house, Caribbean island and other properties. Epstein survivors have described this surveillance system to me and some have gone public. Once the famous politician or other figure knew he or she was on video they tended to do whatever they were told. Here we go again ...when you've got them by the balls their hearts and minds will follow. Sabbatians use this blackmail technique on a wide scale across the world to entrap politicians and others they need to act as demanded. Epstein's private plane, the infamous 'Lolita Express', had many well-known passengers including Bill Clinton while Bill Gates has flown on an Epstein plane and met with him four years aĳer Epstein had been jailed for paedophilia. They subsequently met many times at Epstein's home in New York according to a witness who was there. Epstein's infamous side-kick was Ghislaine Maxwell, daughter of Mossad agent and ultra-Zionist mega-crooked British businessman, Bob Maxwell, who at one time owned the Daily Mirror newspaper. Maxwell was murdered at sea on his boat in 1991 by Sabbatian-controlled Mossad when he became a liability with his business empire collapsing as a former Mossad operative has confirmed (see The Trigger). Money, money, money, funny money ... Before I come to the Sabbatian connection with the last three US presidents I will lay out the crucial importance to Sabbatians of controlling banking and finance. Sabbatian Mayer Amschel Rothschild set out to dominate this arena in his family's quest for total global control. What is freedom? It is, in effect, choice. The more choices you have the freer you are and the fewer your choices the more you are enslaved. In the global structure created over centuries by Sabbatians the biggest decider and restrictor of choice is ... money. Across the world if you

ask people what they would like 'I don't have the money'. This is the idea. A global elite of multi- billionaires are described as 'greedy' and that is true on one level; but control of money – who has it and who doesn't – is not primarily about greed. It's about control. Sabbatians have seized ever more control of finance and sucked the wealth of the world out of the hands of the population. We talk now, after all, about the 'One- percent' and even then the wealthiest are a lot fewer even than that. This has been made possible by a money scam so outrageous and so vast it could rightly be called the scam of scams founded on creating 'money' out of nothing and 'loaning' that with interest to the population. Money out of nothing is called 'credit'. Sabbatians have asserted control over governments and banking ever more completely through the centuries and secured financial laws that allow banks to lend hugely more than they have on deposit in a confidence trick known as fractional reserve lending. Imagine if you could lend money that doesn't exist and charge the recipient interest mansions, private jets, Malibu and Monaco. Banks are only required to keep a fraction of their deposits and wealth in their vaults and they are allowed to lend 'money' they don't have called 'credit'. Go into a bank for a loan and if you succeed the banker will not move any real wealth into your account. They will type into your account the amount of the agreed 'loan' – say £100,000. This is not wealth that really exists; it is non-existent, fresh- air, created-out-of-nothing 'credit' which has never, does not, and will never exist except in theory. Credit is backed by nothing except wind and only has buying power because people think that it has buying power and accept it in return for property, goods and services. I have described this situation as like those cartoon characters you see chasing each other and when they run over the edge of a cliff they keep running forward on fresh air until one of them looks down, realises what's happened, and they all crash into the ravine. The whole foundation of the Sabbatian financial system is to stop people looking down except for periodic moments when they want to crash the system (as in 2008 and 2020 ongoing) and reap the rewards from all the property, businesses and wealth their borrowers had signed over as 'collateral' in return for a 'loan' of fresh air. Most people think that money is somehow created by governments when it comes

into existence from the start as a debt through banks 'lending' illusory money called credit. Yes, the very currency of exchange is a debt from day one issued as an interest-bearing loan. Why don't governments create money interest-free and lend it to their people interest-free? Governments are controlled by Sabbatians and the financial system is controlled by Sabbatians for whom interest-free money would be a nightmare come true. Sabbatians underpin their financial domination through their global network of central banks, including the privately-owned US Federal Reserve and Britain's Bank of England, and this is orchestrated by a privately-owned central bank coordination body called the Bank for International Settlements in Basle, Switzerland, created by the usual suspects including the Rockefellers and Rothschilds. Central bank chiefs don't answer to governments or the people. They answer to the Bank for International Settlements or, in other words, the Global Cult which is dominated today by Sabbatians. There are so many constituent scams within the overall banking scam. When you take out a loan of thin-air credit only the amount of that loan is theoretically brought into circulation to add to the amount in circulation; but you are paying back the principle plus interest. The additional interest is not created and this means that with every 'loan' there is a shortfall in the money in circulation between what is borrowed and what has to be paid back. There is never even close to enough money in circulation to repay all outstanding public and private debt including interest. Coldly weaved in the very fabric of the system is the certainty that some will lose their homes, businesses and possessions to the banking 'lender'. This is less obvious in times of 'boom' when the amount of money in circulation (and the debt) is expanding through more people wanting and getting loans. When a downturn comes and the money supply contracts it becomes painfully obvious that there is not enough money to service all debt and interest. This is less obvious in times of 'boom' when the amount of money in circulation (and the debt) is expanding through more people wanting and getting loans. When a downturn comes and the money supply contracts and it becomes painfully obvious – as in 2008 and currently – that there is not enough money to service all debt and interest. Sabbatian banksters have been leading the human population through a

calculated series of booms (more debt incurred) and busts (when the debt can't be repaid and the banks get the debtor's tangible wealth in exchange for non-existent 'credit'). With each 'bust' Sabbatian bankers have absorbed more of the world's tangible wealth and we end up with the One-percent. Governments are in bankruptcy levels of debt to the same system and are therefore owned by a system they do not control. The Federal Reserve, 'America's central bank', is privately-owned and American presidents only nominally appoint its chairman or woman to maintain the illusion that it's an arm of government. It's not. The 'Fed' is a cartel of private banks which handed billions to its associates and friends after the crash of 2008 and has been Sabbatian-controlled since it was manipulated into being in 1913 through the covert trickery of Rothschild banking agents Jacob Schiff and Paul Warburg, and the Sabbatian Rockefeller family. Somehow from a Jewish population of two-percent and globally 0.2 percent (Sabbatian interlopers remember are far smaller) ultra-Zionists headed the Federal Reserve for 31 years between 1987 and 2018 in the form of Alan Greenspan, Bernard Bernanke and Janet Yellen (now Biden's Treasury Secretary) with Yellen's deputy chairman a Israeli-American dual citizen and ultra-Zionist Stanley Fischer, a former governor of the Bank of Israel. Ultra-Zionist Fed chiefs spanned the presidencies of Ronald Reagan ('Republican'), Father George Bush ('Republican'), Bill Clinton ('Democrat'), Boy George Bush ('Republican') and Barack Obama ('Democrat'). We should really add the pre-Greenspan chairman, Paul Adolph Volcker, 'appointed' by Jimmy Carter ('Democrat') who ran the Fed between 1979 and 1987 during the Carter and Reagan administrations before Greenspan took over. Volcker was a long-time associate and business partner of the Rothschilds. No matter what the 'party' officially in power the United States economy was directed by the same force. Here are members of the Obama, Trump and Biden administrations and see if you can make out a common theme. Barack Obama ('Democrat') Ultra-Zionists Robert Rubin, Larry Summers, and Timothy Geithner ran the US Treasury in the Clinton administration and two of them reappeared with Obama. Ultra-Zionist Fed chairman Alan Greenspan had manipulated the crash of 2008 through deregulation and jumped ship just before the disaster to make way for

ultra- Zionist Bernard Bernanke to hand out trillions to Sabbatian 'too big to fail' banks and businesses, including the ubiquitous ultra-Zionist Goldman Sachs which has an ongoing staff revolving door operation between itself and major financial positions in government worldwide. Obama inherited the fallout of the crash when he took office in January, 2009, and fortunately he had the support of his ultra-Zionist White House Chief of Staff Rahm Emmanuel, son of a terrorist who helped to bomb Israel into being in 1948, and his ultra- Zionist senior adviser David Axelrod, chief strategist in Obama's two successful presidential campaigns. Emmanuel, later mayor of Chicago and former senior fundraiser and strategist for Bill Clinton, is an example of the Sabbatian policy after Israel was established of migrating insider families to America so their children would be born American citizens. 'Obama' chose this financial team throughout his administration to respond to the Sabbatian-instigated Timothy Geithner (ultra-Zionist) Treasury Secretary; Jacob J. Lew, Treasury Secretary; Larry Summers (ultra-Zionist), director of the White House National Economic Council; Paul Adolph Volcker (Rothschild business partner), chairman of the Economic Recovery Advisory Board; Peter Orszag (ultra-Zionist), director of the Office of Management and Budget overseeing all government spending; Penny Pritzker (ultra-Zionist), Commerce Secretary; Jared Bernstein (ultra-Zionist), chief economist and economic policy adviser to Vice President Joe Biden; Mary Schapiro (ultra-Zionist), chair of the Securities and Exchange Commission (SEC); Gary Gensler (ultra- Zionist), chairman of the Commodity Futures Trading Commission (CFTC); Sheila Bair (ultra-Zionist), chair of the Federal Deposit Insurance Corporation (FDIC); Karen Mills (ultra-Zionist), head of the Small Business Administration (SBA); Kenneth Feinberg (ultra-Zionist), Special Master for Executive [bail-out] Compensation. Feinberg would be appointed to oversee compensation (with strings) to 9/11 victims and families in a campaign to stop them having their day in court to question the official story. At the same time ultra- Zionist Bernard Bernanke was chairman of the Federal Reserve and these are only some of the ultra-Zionists with allegiance to Sabbatian-controlled Israel in the Obama government. Obama's biggest corporate donor was ultra-Zionist Goldman Sachs which had employed many in his



administration. Donald Trump ('Republican') Trump claimed to be an outsider (he wasn't) who had come to 'drain the swamp'. He embarked on this goal by immediately appointing ultra-Zionist Steve Mnuchin, a Goldman Sachs employee for 17 years, as his Treasury Secretary. Others included Gary Cohn (ultra-Zionist), chief operating officer of Goldman Sachs, his first Director of the National Economic Council and chief economic adviser, who was later replaced by Larry Kudlow (ultra-Zionist). Trump's senior adviser throughout his four years in the White House was his sinister son-in-law Jared Kushner, a life-long friend of Israel Prime Minister Benjamin Netanyahu. Kushner is the son of a convicted crook who was pardoned by Trump in his last days in office. Other ultra-Zionists in the Trump administration included: Stephen Miller, Senior Policy Adviser; Avrahm Berkowitz, Deputy Adviser to Trump and his Senior Adviser Jared Kushner; Ivanka Trump, Adviser to the President, who converted to Judaism when she married Jared Kushner; David Friedman, Trump lawyer and Ambassador to Israel; Jason Greenblatt, Trump Organization executive vice president and chief legal officer, who was made Special Representative for International Negotiations and the Israeli-Palestinian Conflict; Rod Rosenstein, Deputy Attorney General; Elliot Abrams, Special Representative for Venezuela, then Iran; John Eisenberg, National Security Council Legal Adviser and Deputy Council to the President for National Security Affairs; Anne Neuberger, Deputy National Manager, National Security Agency; Ezra Cohen-Watnick, Acting Under Secretary of Defense for Intelligence; Elan Carr, Special Envoy to monitor and combat anti-Semitism; Len Khodorkovsky, Deputy Special Envoy to monitor and combat anti-Semitism; Reed Cordish, Assistant to the President, Intragovernmental and Technology Initiatives. Trump Vice President Mike Pence and Secretary of State Mike Pompeo, both Christian Zionists, were also vehement supporters of Israel and its goals and ambitions. Donald 'free-speech believer' Trump pardoned a number of financial and violent criminals while ignoring calls to pardon Julian Assange and Edward Snowden whose crimes are revealing highly relevant information about government manipulation and corruption and the widespread illegal surveillance of the American people by US 'security' agencies. It's so good to know that Trump

is on the side of freedom and justice and not mega-criminals with allegiance to Sabbatian-controlled Israel. These included a pardon for Israeli spy Jonathan Pollard who was jailed for life in 1987 under the Espionage Act. Aviem Sella, the Mossad agent who recruited Pollard, was also pardoned by Trump while Assange sat in jail and Snowden remained in exile in Russia. Sella had 'fled' (was helped to escape) to Israel in 1987 and was never extradited despite being charged under the Espionage Act. A Trump White House statement said that Sella's clemency had been 'supported by Benjamin Netanyahu, Ron Dermer, Israel's US Ambassador, David Friedman, US Ambassador to Israel and Miriam Adelson, wife of leading Trump donor Sheldon Adelson who died shortly before. Other friends of Jared Kushner were pardoned along with Sholom Weiss who was believed to be serving the longest-ever white-collar prison sentence of more than 800 years in 2000. The sentence was commuted of Ponzi-schemer Eliyahu Weinstein who defrauded Jews and others out of \$200 million. I did mention that Assange and Snowden were ignored, right? Trump gave Sabbatians almost everything they asked for in military and political support, moving the US Embassy from Tel Aviv to Jerusalem with its critical symbolic and literal implications for Palestinian statehood, and the 'deal of the Century' designed by Jared Kushner and David Friedman which gave the Sabbatian Israeli government the green light to substantially expand its already widespread program of building illegal Jewish-only settlements in the occupied land of the West Bank. This made a two-state 'solution' impossible by seizing all the land of a potential Palestinian homeland and that had been the plan since 1948 and then 1967 when the Arab-controlled Gaza Strip, West Bank, Sinai Peninsula and Syrian Golan Heights were occupied by Israel. All the talks about talks and road maps and delays have been buying time until the West Bank was physically occupied by Israeli real estate. Trump would have to be a monumentally ill-informed idiot not to see that this was the plan he was helping to complete. The Trump administration was in so many ways the Kushner administration which means the Netanyahu administration which means the Sabbatian administration. I understand why many opposing Cult fascism in all its forms gravitated to Trump, but he was a crucial part of the Sabbatian

plan and I will deal with this in the next chapter. Joe Biden ('Democrat') A barely cognitive Joe Biden took over the presidency in January, 2021, along with his fellow empty shell, Vice-President Kamala Harris, as the latest Sabbatian gofers to enter the White House. Names on the door may have changed and the 'party' – the force behind them remained the same as Zionists were appointed to a stream of pivotal areas relating to Sabbatian plans and policy. They included: Janet Yellen, Treasury Secretary, former head of the Federal Reserve, and still another ultra-Zionist running the US Treasury after Mnuchin (Trump), Lew and Geithner (Obama), and Summers and Rubin (Clinton); Anthony Blinken, Secretary of State; Wendy Sherman, Deputy Secretary of State (so that's 'Biden's' Sabbatian foreign policy sorted); Jeff Zients, White House coronavirus coordinator; Rochelle Walensky, head of the Centers for Disease Control; Rachel Levine, transgender deputy health secretary (that's 'Covid' hoax policy under control); Merrick Garland, Attorney General; Alejandro Mayorkas, Secretary of Homeland Security; Cass Sunstein, Homeland Security with responsibility for new immigration laws; Avril Haines, Director of National Intelligence; Anne Neuberger, National Security Agency cybersecurity director (note, cybersecurity); David Cohen, CIA Deputy Director; Ronald Klain, Biden's Chief of Staff (see Rahm Emanuel); Eric Lander, a 'leading geneticist', Office of Science and Technology Policy director (see Smart Grid, synthetic biology agenda); Jessica Rosenworcel, acting head of the Federal Communications Commission (FCC) which controls Smart Grid technology policy and electromagnetic communication systems including 5G. How can it be that so many pivotal positions are held by two-percent of the American population and 0.2 percent of the world population administration after administration no matter who is the president and what is the party? It's a coincidence? Of course it's not and this is why Sabbatians have built their colossal global web of interlocking 'anti-hate' hate groups to condemn anyone who asks these glaring questions as an 'anti-Semite'. The way that Jewish people horrifically abused in Sabbatian-backed Nazi Germany are exploited to this end is stomach-turning and disgusting beyond words. Sabbatian manipulation has reversed the roles of Republicans and Democrats and the same has happened in Britain with the

Conservative and Labour Parties. Republicans and Conservatives were always labelled the 'right' and Democrats and Labour the 'left', but look at the policy positions now and the Democrat-Labour 'left' has moved further to the 'right' than Republicans and Conservatives under the banner of 'Woke', the Cult-created far-right tyranny. Where once the Democrat-Labour 'left' defended free speech and human rights they now seek to delete them and as I said earlier despite the 'Covid' fascism of the Jackboot Johnson Conservative government in the UK the Labour Party of leader Keir Starmer demanded even more extreme measures. The Labour Party has been very publicly absorbed by Sabbatians after a political and media onslaught against the previous leader, the weak and inept Jeremy Corbyn, over made-up allegations of 'anti-Semitism' both by him and his party. The plan was clear with this 'anti-Semite' propaganda and what was required in response was a swift and decisive 'fuck off' from Corbyn and a statement to expose the Anti-Semitism Industry (Sabbatian) attempt to silence Labour criticism of the Israeli government (Sabbatians) and purge the party of all dissent against the extremes of ultra-Zionism (Sabbatians). Instead Corbyn and his party fell to their knees and appeased the abusers which, by definition, is impossible. Appeasing one demand leads only to a new demand to be appeased until takeover is complete. Like I say - 'fuck off' would have been a much more effective policy and I have used it myself with great effect over the years when Sabbatians are on my case which is most of the time. I consider that fact a great compliment, by the way. The outcome of the Labour Party capitulation is that we now have a Sabbatian-controlled Conservative Party 'opposed' by a Sabbatian-controlled Labour Party in a one-party Sabbatian state that hurtles towards the extremes of tyranny (the Sabbatian cult agenda). In America the situation is the same. Labour's Keir Starmer spends his days on his knees with his tongue out pointing to Tel Aviv, or I guess now Jerusalem, while Boris Johnson has an 'anti-Semitism czar' in the form of former Labour MP John Mann who keeps Starmer company on his prayer mat. Sabbatian influence can be seen in Jewish members of the Labour Party who have been ejected for criticism of Israel including those from families that suffered in Nazi Germany. Sabbatians despise real Jewish people and target

them even more harshly because it is so much more difficult to dub them 'anti-Semitic' although in their desperation they do try. The Pushbacker sting Until you realize how easy it is for your mind to be manipulated, you remain the puppet of someone else's game will use the presidencies of Trump and Biden to show how the manipulation of the one-party state plays out behind the illusion of political choice across the world. No two presidencies could – on the face of it – be more different and apparently at odds in terms of direction and policy. A Renegade Mind sees beyond the obvious and focuses on outcomes and consequences and not image, words and waffle. The Cult embarked on a campaign to divide America between those who blindly support its agenda (the mentality known as 'Woke') and those who are pushing back on where the Cult and its Sabbatians want to go. This presents infinite possibilities for dividing and ruling the population by seîing them at war with each other and allows a perceptual ring fence of demonisation to encircle the Pushbackers in a modern version of the Liîle Big Horn in 1876 when American cavalry led by Lieutenant Colonel George Custer were drawn into a trap, surrounded and killed by Native American tribes defending their land of thousands of years from being seized by the government. In this modern version the roles are reversed and it's those defending themselves from the Sabbatian government who are surrounded and the government that's seeking to destroy them. This trap was set years ago and to explain how we must return to 2016 and the emergence of Donald Trump as a candidate to be President of the United States. He set out to overcome the best part of 20 other candidates in the Republican Party before and during the primaries and was not considered by many in those early stages to have a prayer of living in the White House. The Republican Party was said to have great reservations about Trump and yet somehow he won the nomination. When you know how American politics works – politics in general – there is no way that Trump could have become the party's candidate unless the Sabbatian-controlled 'Neocons' that run the Republican Party wanted that to happen. We saw the proof in emails and documents made public by WikiLeaks that the Democratic Party hierarchy, or Democons, systematically undermined the campaign of Bernie Sanders to make sure that Sabbatian gofer

Hillary Clinton won the nomination to be their presidential candidate. If the Democons could do that then the Neocons in the Republican Party could have derailed Trump in the same way. But they didn't and at that stage I began to conclude that Trump could well be the one chosen to be president. If that was the case the 'why' was preÿ clear to see – the goal of dividing America between Cult agenda-supporting Wokers and Pushbackers who gravitated to Trump because he was telling them what they wanted to hear. His constituency of support had been increasingly ignored and voiceless for decades and profoundly through the eight years of Sabbatian puppet Barack Obama. Now here was someone speaking their language of pulling back from the incessant globalisation of political and economic power, the exporting of American jobs to China and elsewhere by 'American' (Sabbatian) corporations, the deletion of free speech, and the mass immigration policies that had further devastated job opportunities for the urban working class of all races and the once American heartlands of the Midwest. Beware the forked tongue Those people collectively sighed with relief that at last a political leader was apparently on their side, but another trait of the Renegade Mind is that you look even harder at people telling you what you want to hear than those who are telling you otherwise. Obviously as I said earlier people wish what they want to hear to be true and genuine and they are much more likely to believe that than someone saying what they don't want to hear and don't want to be true. Sales people are taught to be skilled in eliciting by calculated questioning what their customers want to hear and repeating that back to them as their own opinion to get their targets to like and trust them. Assets of the Cult are also sales people in the sense of selling perception. To read Cult manipulation you have to play the long and expanded game and not fall for the Vaudeville show of party politics. Both American parties are vehicles for the Cult and they exploit them in different ways depending on what the agenda requires at that moment. Trump and the Republicans were used to be the focus of dividing America and isolating Pushbackers to open the way for a Biden presidency to become the most extreme in American history by advancing the full-blown Woke (Cult) agenda with the aim of destroying and silencing Pushbackers now labelled Nazi Trump supporters and

white supremacists. Sabbatians wanted Trump in office for the reasons described by ultra-Zionist Saul Alinsky (1909-1972) who was promoting the Woke philosophy through 'community organising' long before anyone had heard of it. In those days it still went by its traditional name of Marxism. The reason for the manipulated Trump phenomenon was laid out in Alinsky's 1971 book, *Rules for Radicals*, which was his blueprint for overthrowing democratic and other regimes and replacing them with Sabbatian Marxism. Not surprisingly his to-do list was evident in the Sabbatian French and Russian 'Revolutions' and that in China which will become very relevant in the next chapter about the 'Covid' hoax. Among Alinsky's followers have been the deeply corrupt Barack Obama, House Speaker Nancy Pelosi and Hillary Clinton who described him as a 'hero'. All three are Sabbatian stooges with Pelosi personifying the arrogant corrupt idiocy that so widely fronts up for the Cult inner core. Predictably as a Sabbatian advocate of the 'light-bringer' Alinsky features Lucifer on the dedication page of his book as the original radical who gained his own kingdom ('Earth' as we shall see). One of Alinsky's golden radical rules was to pick an individual and focus all attention, hatred and blame on them and not to target faceless bureaucracies and corporations. *Rules for Radicals* is really a Sabbatian handbook with its contents repeatedly employed all over the world for centuries and why wouldn't Sabbatians bring to power their designer-villain to be used as the individual on which all attention, hatred and blame was bestowed? This is what they did and the only question for me is how much Trump knew that and how much he was manipulated. A bit of both, I suspect. This was Alinsky's Trump technique from a man who died in 1972. The technique has spanned history: Pick the target, freeze it, personalize it, polarize it. Don't try to attack abstract corporations or bureaucracies. Identify a responsible individual. Ignore attempts to shift or spread the blame. From the moment Trump came to illusory power everything was about him. It wasn't about Republican policy or opinion, but all about Trump. Everything he did was presented in negative, derogatory and abusive terms by the Sabbatian-dominated media led by Cult operations such as CNN, MSNBC, The New York Times and the Jeff Bezos-owned Washington Post – 'Pick the target, freeze it, personalize it,

polarize it.' Trump was turned into a demon to be vilified by those who hated him and a demi-god loved by those who worshipped him. This, in turn, had his supporters, too, presented as equally demonic in preparation for the punchline later down the line when Biden was about to take office. It was here's a Trump, there's a Trump, everywhere a Trump, Trump. Virtually every news story or happening was filtered through the lens of 'The Donald'. You loved him or hated him and which one you chose was said to define you as Satan's spawn or a paragon of virtue. Even supporting some Trump policies or statements and not others was enough for an assault on your character. No shades of grey were or are allowed. Everything is black and white (literally and figuratively). A Californian I knew had her head utterly scrambled by her hatred for Trump while telling people they should love each other. She was so totally consumed by Trump Derangement Syndrome as it became to be known that this glaring contradiction would never have occurred to her. By definition anyone who criticised Trump or praised his opponents was a hero and this lady described Joe Biden as 'a kind, honest gentleman' when he's a provable liar, mega-crook and vicious piece of work to boot. Sabbatians had indeed divided America using Trump as the fall-guy and all along the clock was ticking on the consequences for his supporters. In hock to his masters Trump gave Sabbatians via Israel almost everything they wanted in his four years. Ask and you shall receive was the dynamic between himself and Benjamin Netanyahu orchestrated by Trump's ultra-Zionist son-in-law Jared Kushner, his ultra-Zionist Ambassador to Israel, David Friedman, and ultra-Zionist 'Israel adviser', Jason Greenblatt. The last two were central to the running and protecting from collapse of his business empire, the Trump Organisation, and colossal business failures made him forever beholden to Sabbatian networks that bailed him out. By the start of the 1990s Trump owed \$4 billion to banks that he couldn't pay and almost \$1 billion of that was down to him personally and not his companies. This mega-disaster was the result of building two new casinos in Atlantic City and buying the enormous Taj Mahal operation which led to crippling debt payments. He had borrowed fantastic sums from 72 banks with major Sabbatian connections and although the scale of debt should have had him living in a



tent alongside the highway they never foreclosed. A plan was devised to lift Trump from the mire by BT Securities Corporation and Rothschild Inc. and the case was handled by Wilber Ross who had worked for the Rothschilds for 27 years. Ross would be named US Commerce Secretary after Trump's election. Another crucial figure in saving Trump was ultra- Zionist 'investor' Carl Icahn who bought the Taj Mahal casino. Icahn was made special economic adviser on financial regulation in the Trump administration. He didn't stay long but still managed to find time to make a tidy sum of a reported \$31.3 million when he sold his holdings affected by the price of steel three days before Trump imposed a 235 percent tariff on steel imports. What amazing bits of luck these people have. Trump and Sabbatian operatives have long had a close association and his mentor and legal adviser from the early 1970s until 1986 was the dark and genetically corrupt ultra- Zionist Roy Cohn who was chief counsel to Senator Joseph McCarthy's 'communist' witch-hunt in the 1950s. Esquire magazine published an article about Cohn with the headline 'Don't mess with Roy Cohn'. He was described as the most feared lawyer in New York and 'a ruthless master of dirty tricks ... [with] ... more than one Mafia Don on speed dial'. Cohn's influence, contacts, support and protection made Trump a front man for Sabbatians in New York with their connections to one of Cohn's many criminal employers, the 'Russian' Sabbatian Mafia. Israel-centric media mogul Rupert Murdoch was introduced to Trump by Cohn and they started a long friendship. Cohn died in 1986 weeks after being disbarred for unethical conduct by the Appellate Division of the New York State Supreme Court. The wheels of justice do indeed run slow given the length of Cohn's crooked career. We are asked to believe that Donald Trump with his fundamental connections to Sabbatian networks and operatives has been leading the fight to stop the Sabbatian agenda for the fascistic control of America and the world. Sure he has. A man entrapped during his years in the White House by Sabbatian operatives and whose biggest financial donor was casino billionaire Sheldon Adelson who was Sabbatian to his DNA?? Oh, do come on. Trump has been used to divide America and isolate Pushbackers on the Cult agenda under the heading of 'Trump supporters', 'insurrectionists' and 'white supremacists'. The US

Intelligence/Mossad Psyop or psychological operation known as QAnon emerged during the Trump years as a central pillar in the Sabbatian campaign to lead Pushbackers into the trap set by those that wished to destroy them. I knew from the start that QAnon was a scam because I had seen the same scenario many times before over 30 years under different names and I had written about one in particular in the books. 'Not again' was my reaction when QAnon came to the fore. The same script is pulled out every few years and a new name added to the leŕthead. The story always takes the same form: 'Insiders' or 'the good guys' in the government- intelligence-military 'Deep State' apparatus were going to instigate mass arrests of the 'bad guys' which would include the Rockefellers, Rothschilds, Barack Obama, Hillary Clinton, George Soros, etc., etc. Dates are given for when the 'good guys' are going to move in, but the dates pass without incident and new dates are given which pass without incident. The central message to Pushbackers in each case is that they don't have to do anything because there is 'a plan' and it is all going to be sorted by the 'good guys' on the inside. 'Trust the plan' was a QAnon mantra when the only plan was to misdirect Pushbackers into puŕjing their trust in a Psyop they believed to be real. Beware, beware, those who tell you what you want to hear and always check it out. Right up to Biden's inauguration QAnon was still claiming that 'the Storm' was coming and Trump would stay on as president when Biden and his cronies were arrested and jailed. It was never going to happen and of course it didn't, but what did happen as a result provided that punchline to the Sabbatian On January 6th, 2021, a very big crowd of Trump supporters gathered in the National Mall in Washington DC down from the Capitol Building to protest at what they believed to be widespread corruption and vote fraud that stopped Trump being re-elected for a second term as president in November, 2020. I say as someone that does not support Trump or Biden that the evidence is clear that major vote-fixing went on to favour Biden, a man with cognitive problems so advanced he can oŕgen hardly string a sentence together without reading the words written for him on the Teleprompter. Glaring ballot discrepancies included serious questions about electronic voting machines that make vote rigging a comparative cinch and hundreds of thousands of paper

votes that suddenly appeared during already advanced vote counts and virtually all of them for Biden. Early Trump leads in crucial swing states suddenly began to close and disappear. The pandemic hoax was used as the excuse to issue almost limitless numbers of mail-in ballots with no checks to establish that the recipients were still alive or lived at that address. They were sent to streams of people who had not even asked for them. Private organisations were employed to gather these ballots and who knows what they did with them before they turned up at the counts. The American election system has been manipulated over decades to become a sick joke with more holes than a Swiss cheese for the express purpose of dictating the results. Then there was the criminal manipulation of information by Sabbatian tech giants like Facebook, Twiĵer and Google-owned YouTube which deleted pro-Trump, anti-Biden accounts and posts while everything in support of Biden was leŕ alone. Sabbatians wanted Biden to win because aĖer the dividing of America it was time for full-on Woke and every aspect of the Cult agenda to be Extreme Silicon Valley bias included blocking information by the New York Post exposing a Biden scandal that should have ended his bid for president in the final weeks of the campaign. Hunter Biden, his monumentally corrupt son, is reported to have sent a laptop to be repaired at a local store and failed to return for it. Time passed until the laptop became the property of the store for non-payment of the bill. When the owner saw what was on the hard drive he gave a copy to the FBI who did nothing even though it confirmed widespread corruption in which the Joe Biden family were using his political position, especially when he was vice president to Obama, to make multiple millions in countries around the world and most notably Ukraine and China. Hunter Biden's one-time business partner Tony Bobulinski went public when the story broke in the New York Post to confirm the corruption he saw and that Joe Biden not only knew what was going on he also profited from the spoils. Millions were handed over by a Chinese company with close connections – like all major businesses in China – to the Chinese communist party of President Xi Jinping. Joe Biden even boasted at a meeting of the Cult's World Economic Forum that as vice president he had ordered the government of Ukraine to fire a prosecutor. What he didn't

mention was that the same man just happened to be investigating an energy company which was part of Hunter Biden's corrupt portfolio. The company was paying him big bucks for no other reason than the influence his father had. Overnight Biden's presidential campaign should have been over given that he had lied the entire Sabbatian-owned mainstream media and Sabbatian- owned Silicon Valley suppressed circulation of the story. This alone went a mighty way to rigging the election of 2020. Cult assets like Mark Zuckerberg at Facebook also spent hundreds of millions to be used in support of Biden and vote 'administration'. The Cult had used Trump as the focus to divide America and was now desperate to bring in moronic, pliable, corrupt Biden to complete the double-whammy. No way were they going to let little things like the will of the people thwart their plan. Silicon Valley widely censored claims that the election was rigged because it was rigged. For the same reason anyone claiming it was rigged was denounced as a 'white supremacist' including the pathetically few Republican politicians willing to say so. Right across the media where the claim was mentioned it was described as a 'false claim' even though these excuses for 'journalists' would have done no research into the subject whatsoever. Trump won seven million more votes than any sitting president had ever achieved while somehow a cognitively-challenged soon to be 78-year-old who was hidden away from the public for most of the campaign managed to win more votes than any presidential candidate in history. It makes no sense. You only had to see election rallies for both candidates to witness the enthusiasm for Trump and the apathy for Biden. Tens of thousands would attend Trump events while Biden was speaking in empty car parks with often only television crews attending and framing their shots to hide the fact that no one was there. It was pathetic to see footage come to light of Biden standing at a podium making speeches only to TV crews and party fixers while reading the words written for him on massive Teleprompter screens. So, yes, those protestors on January 6th had a point about election rigging, but some were about to walk into a trap laid for them in Washington by the Cult Deep State and its QAnon Psyop. This was the Capitol Hill riot ludicrously dubbed an 'insurrection'. The spider and the fly Renegade Minds know there are not two 'sides' in politics, only one side,

the Cult, working through all 'sides'. It's a stage show, a puppet show, to direct the perceptions of the population into focusing on diversions like parties and candidates while missing the puppeteers with their hands holding all the strings. The Capitol Hill 'insurrection' brings us back to the Little Big Horn. Having created two distinct opposing groupings – Woke and Pushbackers – the trap was about to be sprung. Pushbackers were to be encircled and isolated by associating them all in the public mind with Trump and then labelling Trump as some sort of Confederate leader. I knew immediately that the Capitol riot was a set-up because of two things. One was how easy the rioters got into the building with virtually no credible resistance and secondly I could see – as with the 'Covid' hoax in the West at the start of 2020 – how the Cult could exploit the situation to move its agenda forward with great speed. My experience of Cult techniques and activities over more than 30 years has showed me that while they do exploit situations they haven't themselves created this never happens with events of fundamental agenda significance. Every time major events giving cultists the excuse to rapidly advance their plan you find they are manipulated into being for the specific reason of providing that excuse – Problem- Reaction-Solution. Only a tiny minority of the huge crowd of Washington protestors sought to gain entry to the Capitol by smashing windows and breaching doors. That didn't matter. The whole crowd and all Pushbackers, even if they did not support Trump, were going to be lumped together as dangerous insurrectionists and conspiracy theorists. The latter term came into widespread use through a CIA memo in the 1960s aimed at discrediting those questioning the nonsensical official story of the Kennedy assassination and it subsequently became widely employed by the media. It's still being used by inept 'journalists' with no idea of its origin to discredit anyone questioning anything that authority claims to be true. When you are perpetrating a conspiracy you need to discredit the very word itself even though the dictionary definition of conspiracy is merely 'the activity of secretly planning with other people to do something bad or illegal' and 'a general agreement to keep silent about a subject for the purpose of keeping it secret'. On that basis there are conspiracies almost wherever you look. For obvious reasons the Cult and its lapdog media

have to claim there are no conspiracies even though the word appears in state laws as with conspiracy to defraud, to murder, and to corrupt public morals. Agent provocateurs are widely used by the Cult Deep State to manipulate genuine people into acting in ways that suit the desired outcome. By genuine in this case I mean protestors genuinely supporting Trump and claims that the election was stolen. In among them, however, were agents of the state wearing the garb of Trump supporters and QAnon to pump-prime the Capital riot which some genuine Trump supporters naively fell for. I described the situation as 'Come into my parlour said the spider to the fly'. Leaflets appeared through the Woke paramilitary arm Antifa, the anti-fascist fascists, calling on supporters to turn up in Washington looking like Trump supporters even though they hated him. Some of those arrested for breaching the Capitol Building were sourced to Antifa and its stable mate Black Lives Maîer. Both organisations are funded by Cult billionaires and corporations. One man charged for the riot was according to his lawyer a former FBI agent who had held top secret security clearance for 40 years. Aîorney Thomas Plofchan said of his client, 66-year-old Thomas Edward Caldwell: He has held a Top Secret Security Clearance since 1979 and has undergone multiple Special Background Investigations in support of his clearances. After retiring from the Navy, he worked as a section chief for the Federal Bureau of Investigation from 2009-2010 as a GS-12 He also formed and operated a consulting firm performing work, often classified, for U.S government customers including the US. Drug Enforcement Agency, Department of Housing and Urban Development, the US Coast Guard, and the US Army Personnel Command. A judge later released Caldwell pending trial in the absence of evidence about a conspiracy or that he tried to force his way into the building. The New York Post reported a 'law enforcement source' as saying that 'at least two known Antifa members were spoîed' on camera among Trump supporters during the riot while one of the rioters arrested was John Earle Sullivan, a seriously extreme Black Lives Maîer Trump-hater from Utah who was previously arrested and charged in July, 2020, over a BLM-Antifa riot in which drivers were threatened and one was shot. Sullivan is the founder of Utah- based Insurgence USA which is an affiliate of the

Cult-created-and- funded Black Lives Maĵer movement. Footage appeared and was then deleted by Twiĵer of Trump supporters calling out Antifa infiltrators and a group was filmed changing into pro-Trump clothing before the riot. Security at the building was pathetic – as planned. Colonel Leroy Fletcher Prouty, a man with long experience in covert operations working with the US security apparatus, once described the tell-tale sign to identify who is involved in an assassination. He said: No one has to direct an assassination – it happens. The active role is played secretly by permitting it to happen. This is the greatest single clue. Who has the power to call off or reduce the usual security precautions? This principle applies to many other situations and certainly to the Capitol riot of January 6th, 2021. With such a big and potentially angry crowd known to be gathering near the Capitol the security apparatus would have had a major police detail to defend the building with National Guard troops on standby given the strength of feeling among people arriving from all over America encouraged by the QAnon Psyop and statements by Donald Trump. Instead Capitol Police 'security' was flimsy, weak, and easily breached. The same number of officers was deployed as on a regular day and that is a blatant red flag. They were not staffed or equipped for a possible riot that had been an obvious possibility in the circumstances. No protective and effective fencing worth the name was put in place and there were no contingency plans. The whole thing was basically a case of standing aside and waving people in. Once inside police mostly backed off apart from one Capitol police officer who ridiculously shot dead unarmed Air Force veteran protestor Ashli Babbij without a warning as she climbed through a broken window. The 'investigation' refused to name or charge the officer aĜer what must surely be considered a murder in the circumstances. They just liĜed a carpet and swept. The story was endlessly repeated about five people dying in the 'armed insurrection' when there was no report of rioters using weapons. Apart from Babbij the other four died from a heart aĵack, strokes and apparently a drug overdose. Capitol police officer Brian Sicknick was reported to have died aĜer being bludgeoned with a fire extinguisher when he was alive aĜer the riot was over and died later of what the Washington Medical Examiner's Office said was a stroke.

Sicknick had no external injuries. The lies were delivered like rapid fire. There was a narrative to build with incessant repetition of the lie until the lie became the accepted 'everybody knows that' truth. The 'Big Lie' technique of Nazi Propaganda Minister Joseph Goebbels is constantly used by the Cult which was behind the Nazis and is today behind the 'Covid' and 'climate change' hoaxes. Goebbels If you tell a lie big enough and keep repeating it, people will eventually come to believe it. The lie can be maintained only for such time as the State can shield the people from the political, economic and/or military consequences of the lie. It thus becomes vitally important for the State to use all of its powers to repress dissent, for the truth is the mortal enemy of the lie, and thus by extension, the truth is the greatest enemy of the State. Most protestors had a free run of the Capitol Building. This allowed pictures to be taken of rioters in iconic parts of the building including the Senate chamber which could be used as propaganda images against all Pushbackers. One Congresswoman described the scene as 'the worst kind of non-security anybody could ever imagine'. Well, the first part was true, but someone obviously did imagine it and made sure it happened. Some photographs most widely circulated featured people wearing QAnon symbols and now the Psyop would be used to dub all QAnon followers with the ubiquitous fit-all label of 'white supremacist' and 'insurrectionists'. When a Muslim extremist called Noah Green drove his car at two police officers at the Capitol Building killing one in April, 2021, there was no such political and media hysteria. They were just disappointed he wasn't white. Government prosecutor Michael Sherwin, an aggressive, dark-eyed, professional Rojweiler led the 'investigation' and to call it over the top would be to understate reality a thousand fold. Hundreds were tracked down and arrested for the crime of having the wrong political views and people were jailed who had done nothing more than walk in the building, committed no violence or damage to property, took a few pictures and left. They were labelled a 'threat to the Republic' while Biden sat in the White House signing executive orders written for him that were dismantling 'the Republic'. Even when judges ruled that a mother and son should not be in jail the government kept them there. Some of those arrested have been badly beaten by prison guards in Washington and



lawyers for one man said he suffered a fractured skull and was made blind in one eye. Meanwhile a woman is shot dead for no reason by a Capitol Police officer and we are not allowed to know who he is never mind what has happened to him although that will be nothing. The Cult's QAnon/Trump sting to identify and isolate Pushbackers and then target them on the road to crushing and deleting them was a resounding success. You would have thought the Russians had invaded the building at gunpoint and lined up senators for a firing squad to see the political and media reaction. Congresswoman Alexandria Ocasio-Cortez is a child in a woman's body, a terrible- twos, me, me, me, Woker narcissist of such proportions that words have no meaning. She said she thought she was going to die when 'insurrectionists' banged on her office door. It turned out she wasn't even in the Capitol Building when the riot was happening and the 'banging' was a Capitol Police officer. She referred to herself as a 'survivor' which is an insult to all those true survivors of violent and sexual abuse while she lives her pampered and privileged life talking drivel for a living. Her Woke colleague and fellow mega- narcissist Rashida Tlaib broke down describing the devastating effect on her, too, of not being in the building when the rioters were there. Ocasio-Cortez and Tlaib are members of a fully-Woke group of Congresswomen known as 'The Squad' along with Ilhan Omar and Ayanna Pressley. The Squad from what I can see can be identified by its vehement anti-white racism, anti-white men agenda, and, as always in these cases, the absence of brain cells on active. The usual suspects were on the riot case immediately in the form of Democrat ultra-Zionist senators and operatives Chuck Schumer and Adam Schiff demanding that Trump be impeached for 'his part in the insurrection'. The same pair of prats had led the failed impeachment of Trump over the invented 'Russia collusion' nonsense which claimed Russia had helped Trump win the 2016 election. I didn't realise that Tel Aviv had been relocated just outside Moscow. I must find an up-to-date map. The Russia hoax was a Sabbatian operation to keep Trump occupied and impotent and to stop any rapport with Russia which the Cult wants to retain as a perceptual enemy to be pulled out at will. Puppet Biden began a^jacking Russia when he came to office as the Cult seeks more

upheaval, division and war across the world. A two-year stage show 'Russia collusion inquiry' headed by the not-very-bright former 9/11 FBI chief Robert Mueller, with support from 19 lawyers, 40 FBI agents plus intelligence analysts, forensic accountants and other staff, devoured tens of millions of dollars and found no evidence of Russia collusion which a ten-year-old could have told them on day one. Now the same moronic Schumer and Schiff wanted a second impeachment of Trump over the Capitol 'insurrection' (riot) which the arrested development of Schumer called another 'Pearl Harbor' while others compared it with 9/11 in which 3,000 died and, in the case of CNN, with the Rwandan genocide in the 1990s in which an estimated 500,000 to 600,000 were murdered, between 250, 000 and 500,000 women were raped, and populations of whole towns were hacked to death with machetes. To make those comparisons purely for Cult political reasons is beyond insulting to those that suffered and lost their lives and confirms yet again the callous inhumanity that we are dealing with. Schumer is a monumental idiot and so is Schiff, but they serve the Cult agenda and do whatever they're told so they get looked aĜer. Talking of idiots – another inane man who spanned the Russia and Capitol impeachment aĴempts was Senator Eric Swalwell who had the nerve to accuse Trump of collusion with the Russians while sleeping with a Chinese spy called Christine Fang or 'Fang Fang' which is straight out of a Bond film no doubt starring Klaus Schwab as the bloke living on a secret island and controlling laser weapons positioned in space and pointing at world capitals. Fang Fang plays the part of Bond's infiltrator girlfriend which I'm sure she would enjoy rather more than sharing a bed with the brainless Swalwell, lying back and thinking of China. The FBI eventually warned Swalwell about Fang Fang which gave her time to escape back to the Chinese dictatorship. How very thoughtful of them. The second Trump impeachment also failed and hardly surprising when an impeachment is supposed to remove a sĴing president and by the time it happened Trump was no longer president. These people are running your country America, well, officially anyway. Terrifying isn't it? Outcomes tell the story - always The outcome of all this – and it's the outcome on which Renegade Minds focus, not the words – was that a vicious, hysterical and obviously

pre-planned assault was launched on Pushbackers to censor, silence and discredit them and even targeted their right to earn a living. They have since been condemned as 'domestic terrorists' that need to be treated like Al-Qaeda and Islamic State. 'Domestic terrorists' is a label the Cult has been trying to make stick since the period of the Oklahoma bombing in 1995 which was blamed on 'far-right domestic terrorists'. If you read The Trigger you will see that the bombing was clearly a Problem-Reaction-Solution carried out by the Deep State during a Bill Clinton administration so corrupt that no dictionary definition of the term would even nearly suffice. Nearly 30, 000 troops were deployed from all over America to the empty streets of Washington for Biden's inauguration. Ten thousand of them stayed on with the pretext of protecting the capital from insurrectionists when it was more psychological programming to normalise the use of the military in domestic law enforcement in support of the Cult plan for a police-military state. Biden's fascist administration began a purge of 'wrong-thinkers' in the military which means anyone that is not on board with Woke. The Capitol Building was surrounded by a fence with razor wire and the Land of the Free was further symbolically and literally dismantled. The circle was completed with the installation of Biden and the exploitation of the QAnon Psyop. America had never been so divided since the civil war of the 19th century, Pushbackers were isolated and dubbed terrorists and now, as was always going to happen, the Cult immediately set about deleting what liĵle was leĜ of freedom and transforming American society through a swish of the hand of the most controlled 'president' in American history leading (officially at least) the most extreme regime since the country was declared an independent state on July 4th, 1776. Biden issued undebated, dictatorial executive orders almost by the hour in his opening days in office across the whole spectrum of the Cult wish-list including diluting controls on the border with Mexico allowing thousands of migrants to illegally enter the United States to transform the demographics of America and import an election-changing number of perceived Democrat voters. Then there were Biden deportation amnesties for the already illegally resident (estimated to be as high as 20 or even 30 million). A bill before Congress awarded American citizenship to anyone who could prove they had

worked in agriculture for just 180 days in the previous two years as 'Big Ag' secured its slave labour long-term. There were the plans to add new states to the union such as Puerto Rico and making Washington DC a state. They are all parts of a plan to ensure that the Cult-owned Woke Democrats would be permanently in power. Border – what border? I have exposed in detail in other books how mass immigration into the United States and Europe is the work of Cult networks fuelled by the tens of billions spent to this and other ends by George Soros and his global Open Society (open borders) Foundations. The impact can be seen in America alone where the population has increased by 100 million in little more than 30 years mostly through immigration. I wrote in *The Answer* that the plan was to have so many people crossing the southern border that the numbers become unstoppable and we are now there under Cult-owned Biden. El Salvador in Central America puts the scale of what is happening into context. A third of the population now lives in the United States, much of it illegally, and many more are on the way. The methodology is to crush Central and South American countries economically and spread violence through machete-wielding psychopathic gangs like MS-13 based in El Salvador and now operating in many American cities. Biden-imposed lax security at the southern border means that it is all but open. He said before his 'election' that he wanted to see a surge towards the border if he became president and that was the green light for people to do just that after election day to create the human disaster that followed for both America and the migrants. When that surge came the imbecilic Alexandria Ocasio-Cortez said it wasn't a 'surge' because they are 'children, not insurgents' and the term 'surge' (used by Biden) was a claim of 'white supremacists'. This disingenuous lady may one day enter the realm of the most basic intelligence, but it won't be any time soon. Sabbatians and the Cult are in the process of destroying America by importing violent people and gangs in among the genuine to terrorise American cities and by overwhelming services that cannot cope with the sheer volume of new arrivals. Something similar is happening in Europe as Western society in general is targeted for demographic and cultural transformation and upheaval. The plan demands violence and crime to create an environment of intimidation, fear and division and

Soros has been funding the election of district attorneys across America who then stop prosecuting many crimes, reduce sentences for violent crimes and free as many violent criminals as they can. Sabbatians are creating the chaos from which order – their order – can respond in a classic Problem-Reaction-Solution. A Freemasonic motto says 'Ordo Ab Chao' (Order out of Chaos) and this is why the Cult is constantly creating chaos to impose a new 'order'. Here you have the reason the Cult is constantly creating chaos. The 'Covid' hoax can be seen with those entering the United States by plane being forced to take a 'Covid' test while migrants flooding through southern border processing facilities do not. Nothing is put in the way of mass migration and if that means ignoring the government's own 'Covid' rules then so be it. They know it's all bullshit anyway. Any pushback on this is denounced as 'racist' by Wokers and Sabbatian fronts like the ultra-Zionist Anti-Defamation League headed by the appalling Jonathan Greenblatt which at the same time argues that Israel should not give citizenship and voting rights to more Palestinian Arabs or the 'Jewish population' (in truth the Sabbatian network) will lose control of the country. Biden's masters have declared that countries like El Salvador are so dangerous that their people must be allowed into the United States for humanitarian reasons when there are fewer murders in large parts of many Central American countries than in US cities like Baltimore. That is not to say Central America cannot be a dangerous place and Cult-controlled American governments have been making it so since way back, along with the dismantling of economies, in a long-term plan to drive people north into the United States. Parts of Central America are very dangerous, but in other areas the story is being greatly exaggerated to justify relaxing immigration criteria. Migrants are being offered free healthcare and education in the United States as another incentive to head for the border and there is no requirement to be financially independent before you can enter to prevent the resources of America being drained. You can't blame migrants for seeking what they believe will be a better life, but they are being played by the Cult for dark and nefarious ends. The numbers since Biden took office are huge. In February, 2021, more than 100,000 people were known to have tried to enter the US illegally through the southern border (it was

34,000 in the same month in 2020) and in March it was 170,000 – a 418 percent increase on March, 2020. These numbers are only known people, not the ones who get in unseen. The true figure for migrants illegally crossing the border in a single month was estimated by one congressman at 250,000 and that number will only rise under Biden's current policy. Gangs of murdering drug-running thugs that control the Mexican side of the border demand money – thousands of dollars – to let migrants cross the Rio Grande into America. At the same time gun battles are breaking out on the border several times a week between rival Mexican drug gangs (which now operate globally) who are equipped with sophisticated military-grade weapons, grenades and armoured vehicles. While the Capitol Building was being 'protected' from a non-existent 'threat' by thousands of troops, and others were still deployed at the time in the Cult Neocon war in Afghanistan, the southern border of America was left to its fate. This is not incompetence, it is cold calculation. By March, 2021, there were 17,000 unaccompanied children held at border facilities and many of them are ensnared by people traffickers for paedophile rings and raped on their journey north to America. This is not conjecture – this is fact. Many of those designated children are in reality teenage boys or older. Meanwhile Wokers posture their self-purity for encouraging poor and tragic people to come to America and face this nightmare both on the journey and at the border with the disgusting figure of House Speaker Nancy Pelosi giving disingenuous speeches about caring for migrants. The woman's evil. Wokers condemned Trump for having children in cages at the border (so did Obama, Shhhh), but now they are sleeping on the floor without access to a shower with one border facility 729 percent over capacity. The Biden insanity even proposed flying migrants from the southern border to the northern border with Canada for 'processing'. The whole shambles is being overseen by ultra-Zionist Secretary of Homeland Security, the moronic liar Alejandro Mayorkas, who banned news cameras at border facilities to stop Americans seeing what was happening. Mayorkas said there was not a ban on news crews; it was just that they were not allowed to film. Alongside him at Homeland Security is another ultra-Zionist Cass Sunstein appointed by Biden to oversee new immigration laws. Sunstein despises conspiracy

researchers to the point where he suggests they should be banned or taxed for having such views. The man is not bonkers or anything. He's perfectly well-adjusted, but adjusted to what is the question. Criticise what is happening and you are a 'white supremacist' when earlier non-white immigrants also oppose the numbers which effect their lives and opportunities. Black people in poor areas are particularly damaged by uncontrolled immigration and the increased competition for work opportunities with those who will work for less. They are also losing voting power as Hispanics become more dominant in former black areas. It's a downward spiral for them while the billionaires behind the policy drone on about how much they care about black people and 'racism'. None of this is about compassion for migrants or black people – that's just wind and air. Migrants are instead being mercilessly exploited to transform America while the countries they leave are losing their future and the same is true in Europe. Mass immigration may now be the work of Woke Democrats, but it can be traced back to the 1986 Immigration Reform and Control Act (it wasn't) signed into law by Republican hero President Ronald Reagan which gave amnesty to millions living in the United States illegally and other incentives for people to head for the southern border. Here we have the one-party state at work again. Save me syndrome Almost every aspect of what I have been exposing as the Cult agenda was on display in even the first days of 'Biden' with silencing of Pushbackers at the forefront of everything. A Renegade Mind will view the Trump years and QAnon in a very different light to their supporters and advocates as the dots are connected. The QAnon/Trump Psyop has given the Cult all it was looking for. We may not know how much, or liĵle, that Trump realised he was being used, but that's a side issue. This pincer movement produced the desired outcome of dividing America and having Pushbackers isolated. To turn this around we have to look at new routes to empowerment which do not include handing our power to other people and groups through what I will call the 'Save Me Syndrome' – 'I want someone else to do it so that I don't have to'. We have seen this at work throughout human history and the QAnon/Trump Psyop is only the latest incarnation alongside all the others. Religion is an obvious expression of this when people look to a 'god'

or priest to save them or tell them how to be saved and then there are 'save me' politicians like Trump. Politics is a diversion and not a 'saviour'. It is a means to block positive change, not make it possible. Save Me Syndrome always comes with the same repeating theme of handing your power to whom or what you believe will save you while your real 'saviour' stares back from the mirror every morning. Renegade Minds are constantly vigilant in this regard and always asking the question 'What can I do?' rather than 'What can someone else do for me?' Gandhi was right when he said: 'You must be the change you want to see in the world.' We are indeed the people we have been waiting for. We are presented with a constant raft of reasons to concede that power to others and forget where the real power is. Humanity has the numbers and the Cult does not. It has to use diversion and division to target the unstoppable power that comes from unity. Religions, governments, politicians, corporations, media, QAnon, are all different manifestations of this power- diversion and dilution. Refusing to give your power to governments and instead handing it to Trump and QAnon is not to take a new direction, but merely to recycle the old one with new names on the posters. I will explore this phenomenon as we proceed and how to break the cycles and recycles that got us here through the mists of repeating perception and so repeating history. For now we shall turn to the most potent example in the entire human story of the consequences that follow when you give your power away. I am talking, of course, of the 'Covid' hoax. 'Covid': Calculated catastrophe Facts are threatening to those invested in fraud e can easily unravel the real reason for the 'Covid pandemic' hoax by employing the Renegade Mind methodology that I have outlined this far. We'll start by comparing the long-planned Cult outcome with the 'Covid pandemic' outcome. Know the outcome and you'll see the journey. I have highlighted the plan for the Hunger Games Society which has been in my books for so many years with the very few controlling the very many through ongoing dependency. To create this dependency it is essential to destroy independent livelihoods, businesses and employment to make the population reliant on the state (the Cult) for even the basics of life through a guaranteed pittance income. While independence of income remained these Cult ambitions would be



thwarted. With this knowledge it was easy to see where the 'pandemic' hoax was going once talk of 'lockdowns' began and the closing of all but perceived 'essential' businesses to 'save' us from an alleged 'deadly virus'. Cult corporations like Amazon and Walmart were naturally considered 'essential' while mom and pop shops and stores had their doors closed by fascist decree. As a result with every new lockdown and new regulation more small and medium, even large businesses not owned by the Cult, went to the wall while Cult giants and their frontmen and women grew financially fatter by the second. Mom and pop were denied an income and the right to earn a living and the wealth of people like Jeff Bezos (Amazon), Mark Zuckerberg (Facebook) and Sergei Brin and Larry Page (Google/Alphabet) have reached record levels. The Cult was increasing its own power through further dramatic concentrations of wealth while the competition was being destroyed and brought into a state of dependency. Lockdowns have been instigated to secure that very end and were never anything to do with health. My brother Paul spent 45 years building up a bus repair business, but lockdowns meant buses were running at a fraction of normal levels for months on end. Similar stories can be told in their hundreds of millions worldwide. Efforts of a lifetime coldly destroyed by Cult multi-billionaires and their lackeys in government and law enforcement who continued to earn their living from the taxation of the people while denying the right of the same people to earn theirs. How different it would have been if those making and enforcing these decisions had to face the same financial hardships of those they affected, but they never do. Gates of Hell the psychopathic figure of Cult operative Bill Gates. His puppet Tedros at the World Health Organization declared 'Covid' a pandemic in March, 2020. The WHO had changed the definition of a 'pandemic' in 2009 just a month before declaring the 'swine flu pandemic' which would not have been so under the previous definition. The same applies to 'Covid'. The definition had included... 'an infection by an infectious agent, occurring simultaneously in different countries, with a significant mortality rate relative to the proportion of the population infected'. The new definition removed the need for 'significant mortality'. The 'pandemic' has been fraudulent even down to the definition, but Gates demanded

economy-destroying lockdowns, school closures, social distancing, mandatory masks, a 'vaccination' for every man, woman and child on the planet and severe consequences and restrictions for those that refused. Who gave him this power? The what his daddy tells him. He and his psychopathic missus even smiled when they said that much worse was to come (what they knew was planned to come). Gates responded in the majer-of-fact way of all psychopaths to a question about the effect on the world Well, it won't go to zero but it will shrink. Global GDP is probably going to take the biggest hit ever [Gates was smiling as he said this] ... in my lifetime this will be the greatest economic hit. But you don't have a choice. People act as if you have a choice. People don't feel like going to the stadium when they might get infected ... People are deeply affected by seeing these stats, by knowing they could be part of the transmission chain, old people, their parents and grandparents, could be affected by this, and so you don't get to say ignore what is going There will be the ability to open up, particularly in rich countries, if things are done well over the next few months, but for the world at large normalcy only returns when we have largely vaccinated the entire population. The man has no compassion or empathy. How could he when he's a psychopath like all Cult players? My own view is that even beyond that he is very seriously mentally ill. Look in his eyes and you can see this along with his crazy flailing arms. You don't do what he has done to the world population since the start of 2020 unless you are mentally ill and at the most extreme end of psychopathic. You especially don't do it when to you know, as we shall see, that cases and deaths from 'Covid' are fakery and a product of monumental figure massaging. 'These stats' that Gates referred to are based on a 'test' that's not testing for the 'virus' as he has known all along. He made his fortune with big Cult support as an infamously ruthless soŕware salesman and now buys global control of 'health' (death) policy without the population he affects having any say. It's a breathtaking outrage. Gates talked about people being deeply affected by fear of 'Covid' when that was because of him and his global network lying to them minute-by-minute supported by a lying media that he seriously influences and funds to the tune of hundreds of millions. He's handed big sums to media operations including the BBC,

NBC, Al Jazeera, Univision, PBS NewsHour, ProPublica, National Journal, The Guardian, The Financial Times, The Atlantic, Texas Tribune, USA Today publisher Gannett, Washington Monthly, Le Monde, Center for Investigative Reporting, Pulitzer Center on Crisis Reporting, National Press Foundation, International Center for Journalists, Solutions Journalism Network, the Poynter Institute for Media Studies, and many more. Gates is everywhere in the 'Covid' hoax and the man must go to prison – or a mental facility – for the rest of his life and his money distributed to those he has taken such enormous psychopathic pleasure in crushing. The Hunger Games global structure demands a police-military state – a fusion of the two into one force – which viciously imposes the will of the Cult on the population and protects the Cult from public rebellion. In that regard, too, the 'Covid' hoax just keeps on giving. Often unlawful, ridiculous and contradictory 'Covid' rules and regulations have been policed across the world by moronic automatons and psychopaths made faceless by face-nappy masks and acting like the Nazi SS and fascist blackshirts and brownshirts of Hitler and Mussolini. The smallest departure from the rules decreed by the psychos in government and their clueless gofers were jumped upon by the face-nappy fascists. Brutality against public protestors soon became commonplace even on girls, women and old people as the brave men with the batons – the Face-Nappies as I call them – broke up peaceful protests and handed out fines like confetti to people who couldn't earn a living let alone pay hundreds of pounds for what was once an accepted human right. Robot Face-Nappies of Nottingham police in the English East Midlands fined one group £11,000 for attending a child's birthday party. For decades I charted the transformation of law enforcement as genuine, decent officers were replaced with psychopaths and the brain dead who would happily and brutally do whatever their masters told them. Now they were let loose on the public and I would emphasise the point that none of this just happened. The step-by-step change in the dynamic between police and public was orchestrated from the shadows by those who knew where this was all going and the same with the perceptual reframing of those in all levels of authority and official administration through 'training courses' by organisations such as Common Purpose which was created in

the late 1980s and given a massive boost in Blair era Britain until it became a global phenomenon. Supposed public 'servants' began to view the population as the enemy and the same was true of the police. This was the start of the explosion of behaviour manipulation organisations and networks preparing for the all-war on the human psyche unleashed with the dawn of 2020. I will go into more detail about this later in the book because it is a core part of what is Police desecrated beauty spots to deter people gathering and arrested women for walking in the countryside alone 'too far' from their homes. We had arrogant, clueless sergeants in the Isle of Wight police where I live posting on Facebook what they insisted the population must do or else. A schoolmaster sergeant called Radford looked young enough for me to ask if his mother knew he was out, but he was posting what he expected people to do while a Sergeant Wilkinson boasted about fining lads for meeting in a McDonald's car park where they went to get a lockdown takeaway. Wilkinson added that he had even cancelled their order. What a pair of prats these people are and yet they have increasingly become the norm among Jackboot Johnson's Yellowshirts once known as the British police. This was the theme all over the world with police savagery common during lockdown protests in the United States, the Netherlands, and the fascist state of Victoria in Australia under its tyrannical and again moronic premier Daniel Andrews. Amazing how tyrannical and moronic tend to work as a team and the same combination could be seen across America as arrogant, narcissistic Woke governors and mayors such as Gavin Newsom (California), Andrew Cuomo (New York), Gretchen Whitmer (Michigan), Lori Lightfoot (Chicago) and Eric Garcetti (Los Angeles) did their Nazi and Stalin impressions with the full support of the compliant brutality of their enforcers in uniform as they arrested small business owners defying fascist shutdown orders and took them to jail in ankle shackles and handcuffs. This happened to bistro owner Marlena Pavlos-Hackney in Gretchen Whitmer's fascist state of Michigan when police arrived to enforce an order by a state-owned judge for 'putting the community at risk' at a time when other states like Texas were dropping restrictions and migrants were pouring across the southern border without any 'Covid' questions at all. I'm sure there are many officers appalled by what they are

ordered to do, but not nearly enough of them. If they were truly appalled they would not do it. As the months passed every opportunity was taken to have the military involved to make their presence on the streets ever more familiar and 'normal' for the longer-term goal of police-military. Another crucial element to the Hunger Games enforcement network has been encouraging the public to report neighbours and others for 'breaking the lockdown rules'. The group faced with £11,000 in fines at the child's birthday party would have been doxxed-in by a neighbour with a brain the size of a pea. The technique was most famously employed by the Stasi secret police in communist East Germany who had public informants placed throughout the population. A police chief in the UK says his force doesn't need to carry out 'Covid' patrols when they are flooded with so many calls from the public reporting other people for visiting the beach. Dorset police chief James Vaughan said people were so enthusiastic about snitching on their fellow humans they were now operating as an auxiliary arm of the police: 'We are still getting around 400 reports a week from the public, so we will respond to are very quick to pick the phone up and tell us.' Vaughan didn't say that this is a pillar of all tyrannies of whatever complexion and the means to hugely extend the reach of enforcement while spreading that might get them reported. Those narcissistic Isle of Wight sergeants Radford and Wilkinson never fail to add a link to their Facebook posts where the public can inform on their fellow slaves. Neither would be self-aware enough to realise they were imitating the Stasi which they might well never have heard of. Government psychologists that I will expose later laid out a policy to turn communities against each other in the same way. A coincidence? Yep, and I can knit fog I knew from the start of the alleged pandemic that this was a Cult operation. It presented limitless potential to rapidly advance the Cult agenda and exploit manipulated fear to demand that every man, woman and child on the planet was 'vaccinated' in a process never used on humans before which infuses self-replicating synthetic material into human cells. Remember the plan to transform the human body from a biological to a synthetic biological state. I'll deal with the 'vaccine' (that's not actually a vaccine) when I focus on the genetic agenda. Enough to say here that mass global 'vaccination' justified by this 'new virus'

set alarms ringing after 30 years of tracking these people and their methods. The 'Covid' hoax officially beginning in China was also a big red flag for reasons I will be explaining. The agenda potential was so enormous that I could dismiss any idea that the 'virus' appeared naturally. Major happenings with major agenda implications never occur without Cult involvement in making them happen. My questions were twofold in early 2020 as the media began its campaign to induce global fear and hysteria: Was this alleged infectious agent released on purpose by the Cult or did it even exist at all? I then did what I always do in these situations. I sat, observed and waited to see where the evidence and information would take me. By March and early April synchronicity was strongly – and ever more so since then – pointing me in the direction of there is no 'virus'. I went public on that with derision even from swathes of the alternative media that voiced a scenario that the Chinese government released the 'virus' in league with Deep State elements in the United States from a top-level bio-lab in Wuhan where the 'virus' is said to have first appeared. I looked at that possibility, but I didn't buy it for several reasons. Deaths from the 'virus' did not in any way match what they would have been with a 'deadly bioweapon' and it is much more effective if you sell the illusion of an infectious agent rather than having a real one unless you can control through injection who has it and who doesn't. Otherwise you lose control of events. A made-up 'virus' gives you a blank sheet of paper on which you can make it do whatever you like and have any symptoms or mutant 'variants' you choose to add while a real infectious agent would limit you to what it actually does. A phantom disease allows you to have endless ludicrous 'studies' on the 'Covid' dollar to widen the perceived impact by inventing ever more 'at risk' groups including one study which said those who walk slowly may be almost four times more likely to die from the 'virus'. People are in psychiatric wards for less. A real 'deadly bioweapon' can take out people in the hierarchy that are not part of the Cult, but essential to its operation. Obviously they don't want that. Releasing a real disease means you immediately lose control of it. Releasing an illusory one means you don't. Again it's vital that people are extra careful when dealing with what they want to hear. A bioweapon unleashed from a Chinese laboratory in collusion with the

American Deep State may fit a conspiracy narrative, but is it true? Would it not be far more effective to use the excuse of a 'virus' to justify the real bioweapon – the 'vaccine'? That way your disease agent does not have to be transmitted and arrives directly through a syringe. I saw a French virologist Luc Montagnier quoted in the alternative media as saying he had discovered that the alleged 'new' severe acute respiratory syndrome coronavirus , or SARS-CoV-2, was made artificially and included elements of the human immunodeficiency 'virus' (HIV) and a parasite that causes malaria. SARS-CoV-2 is alleged to trigger an alleged illness called Covid-19. I remembered Montagnier's name from my research years before into claims that an HIV 'retrovirus' causes AIDs – claims that were demolished by Berkeley virologist Peter Duesberg who showed that no one had ever proved that HIV causes acquired immunodeficiency syndrome or AIDS. Claims that become accepted as fact, publicly and medically, with no proof whatsoever are an ever-recurring story that profoundly applies to 'Covid'. Nevertheless, despite the lack of proof, Montagnier's team at the Pasteur Institute in Paris had a long dispute with American researcher Robert Gallo over which of them discovered and isolated the HIV 'virus' and with no evidence found it to cause AIDS. You will see later that there is also no evidence that any 'virus' causes any disease or that there is even such a thing as a 'virus' in the way it is said to exist. The claim to have 'isolated' the HIV 'virus' will be presented in its real context as we come to the shocking story – and it is a story – of SARS-CoV-2 and so will Montagnier's assertion that he identified the full SARS-CoV-2 genome.

Hoax in the making We can pick up the 'Covid' story in 2010 and the publication by the Rockefeller Foundation of a document called 'Scenarios for the Future of Technology and International Development'. The inner circle of the Rockefeller family has been serving the Cult since John D. Rockefeller (1839-1937) made his fortune with Standard Oil. It is less well known that the same Rockefeller – the Bill Gates of his day – was responsible for establishing what is now referred to as 'Big Pharma', the global network of pharmaceutical companies that make outrageous profits dispensing scalpel and drug 'medicine' and are obsessed with pumping vaccines in ever-increasing number into as many human arms and backsides as possible. John

D. Rockefeller was the driving force behind the creation of the 'education' system in the United States and elsewhere specifically designed to program the perceptions of generations thereafter. The Rockefeller family donated exceptionally valuable land in New York for the United Nations building and were central in establishing the World Health Organization in 1948 as an agency of the UN which was created from the start as a Trojan horse and stalking horse for world government. Now enter Bill Gates. His family and the Rockefellers have long been extremely close and I have seen genealogy which claims that if you go back far enough the two families fuse into the same bloodline. Gates has said that the Bill and Melinda Gates Foundation was inspired by the Rockefeller Foundation and why not when both are serving the same Cult? Major tax-exempt foundations are overwhelmingly criminal enterprises in which Cult assets fund the Cult agenda in the guise of 'philanthropy' while avoiding tax in the process. Cult operatives can become mega-rich in their role of front men and women for the psychopaths at the inner core and they, too, have to be psychopaths to knowingly serve such evil. Part of the deal is that a big percentage of the wealth gleaned from representing the Cult has to be spent advancing the ambitions of the Cult and hence you have the Rockefeller Foundation, Bill and Melinda Gates Foundation (and so many more) and people like George Soros with his global Open Society Foundations spending their billions in pursuit of global Cult control. Gates is a global public face of the Cult with his interventions in world affairs including Big Tech influence; a central role in the 'Covid' and 'vaccine' scam; promotion of the climate change shakedown; manipulation of education; geoengineering of the skies; and his food-control agenda as the biggest owner of farmland in America, his GMO promotion and through other means. As one writer said: 'Gates monopolizes or wields disproportionate influence over the tech industry, global health and vaccines, agriculture and food policy (including biopiracy and fake food), weather modification and other climate technologies, surveillance, education and media.' The almost limitless wealth secured through Microsoft and other not-allowed-to-fail ventures (including vaccines) has been ploughed into a long, long list of Cult projects designed to enslave the entire human race. Gates and the Rockefellers have



been working as one unit with the Rockefeller-established World Health Organization leading global 'Covid' policy controlled by Gates through his mouth-piece Tedros. Gates became the WHO's biggest funder when Trump announced that the American government would cease its donations, but Biden immediately said he would restore the money when he took office in January, 2021. The Gates Foundation (the Cult) owns through limitless funding the world health system and the major players across the globe in the 'Covid' hoax. Okay, with that background we return to that Rockefeller Foundation document of 2010 headed 'Scenarios for the Future of Technology and International Development' and its 'imaginary' epidemic of a virulent and deadly influenza strain which infected 20 percent of the global population and killed eight million in seven months. The Rockefeller scenario was that the epidemic destroyed economies, closed shops, offices and other businesses and led to governments imposing fierce rules and restrictions that included mandatory wearing of face masks and body-temperature checks to enter communal spaces like railway stations and supermarkets. The document predicted that even after the height of the Rockefeller- envisaged epidemic the authoritarian rule would continue to deal with further pandemics, transnational terrorism, environmental crises and rising poverty. Now you may think that the Rockefellers are our modern-day seers or alternatively, and rather more likely, that they well knew what was planned a few years further on. Fascism had to be imposed, you see, to 'protect citizens from risk and exposure'. The Rockefeller scenario document said: During the pandemic, national leaders around the world flexed their authority and imposed airtight rules and restrictions, from the mandatory wearing of face masks to body-temperature checks at the entries to communal spaces like train stations and supermarkets. Even after the pandemic faded, this more authoritarian control and oversight of citizens and their activities stuck and even intensified. In order to protect themselves from the spread of increasingly global problems – from pandemics and transnational terrorism to environmental crises and rising poverty – leaders around the world took a firmer grip on power. At first, the notion of a more controlled world gained wide acceptance and approval. Citizens willingly gave up some of their

sovereignty – and their privacy – to more paternalistic states in exchange for greater safety and stability. Citizens were more tolerant, and even eager, for top- down direction and oversight, and national leaders had more latitude to impose order in the ways they saw fit. In developed countries, this heightened oversight took many forms: biometric IDs for all citizens, for example, and tighter regulation of key industries whose stability was deemed vital to national interests. In many developed countries, enforced cooperation with a suite of new regulations and agreements slowly but steadily restored both order and, importantly, There we have the prophetic Rockefellers in 2010 and three years later came their paper for the Global Health Summit in Beijing, China, when government representatives, the private sector, international organisations and groups met to discuss the next 100 years of ‘global health’. The Rockefeller Foundation-funded paper was called ‘Dreaming the Future of Health for the Next 100 Years and more prophecy ensued as it described a dystopian future: ‘The abundance of data, digitally tracking and linking people may mean the ‘death of privacy’ and may replace physical interaction with transient, virtual connection, generating isolation and raising questions of how values are shaped in virtual networks.’ Next in the ‘Covid’ hoax preparation sequence came a ‘table top’ simulation in 2018 for another ‘imaginary’ pandemic of a disease called Clade X which was said to kill 900 million people. The exercise was organised by the Gates-funded Johns Hopkins University’s Center for Health Security in the United States and this is the very same university that has been compiling the disgustingly and systematically erroneous global figures for ‘Covid’ cases and deaths. Similar Johns Hopkins health crisis scenarios have included the Dark Winter exercise in 2001 and Atlantic Storm in 2005. For sheer predictive genius look no further prophecy-watchers than the Bill Gates-funded Event 201 held only six weeks before the ‘coronavirus pandemic’ is supposed to have broken out in China and Event 201 was based on a scenario of a global ‘coronavirus pandemic’. Melinda Gates, the great man’s missus, told the BBC that he had ‘prepared for years’ for a coronavirus pandemic which told us what we already knew. Nostradamugates had predicted in a TED talk in 2015 that a pandemic was coming that would kill a lot of people and demolish the world economy.

My god, the man is a machine – possibly even literally. Now here he was only weeks before the real thing funding just such a simulated scenario and involving his friends and associates at Johns Hopkins, the World Economic Forum Cult-front of Klaus Schwab, the United Nations, Johnson & Johnson, major banks, and officials from China and the Centers for Disease Control in the United States. What synchronicity – Johns Hopkins would go on to compile the fraudulent 'Covid' figures, the World Economic Forum and Schwab would push the 'Great Reset' in response to 'Covid', the Centers for Disease Control would be at the forefront of 'Covid' policy in the United States, Johnson & Johnson would produce a 'Covid vaccine', and everything would officially start just weeks later in China. Spooky, eh? They were even accurate in creating a simulation of a 'virus' pandemic because the 'real thing' would also be a simulation. Event 201 was not an exercise preparing for something that might happen; it was a rehearsal for what those in control knew was going to happen and very shortly. Hours of this simulation were posted on the Internet and the various themes and responses mirrored what would soon be imposed to transform human society. News stories were inserted and what they said would be commonplace a few weeks later with still more prophecy perfection. Much discussion focused on the need to deal with misinformation and the 'anti-vax movement' which is exactly what happened when the 'virus' arrived – was said to have arrived – in the West. Cult-owned social media banned criticism and exposure of the official 'virus' narrative and when I said there was no 'virus' in early April, 2020, I was banned by one platform after another including YouTube, Facebook and later Twitter. The mainstream broadcast media in Britain was in effect banned from interviewing me by the Tony-Blair-created government broadcasting censor Ofcom headed by career government bureaucrat Melanie Dawes who was appointed just as the 'virus' hoax was about to play out in January, 2020. At the same time the Ickonic media platform was using Vimeo, another ultra-Zionist-owned operation, while our own player was being created and they deleted in an instant hundreds of videos, documentaries, series and shows to confirm their unbelievable vindictiveness. We had copies, of course, and they had to be restored one by one when our player was ready. These people

have no class. Sabbatian Facebook promised free advertisements for the Gates- controlled World Health Organization narrative while deleting 'false claims and conspiracy theories' to stop 'misinformation' about the alleged coronavirus. All these responses could be seen just a short while earlier in the scenarios of Event 201. Extreme censorship was absolutely crucial for the Cult because the official story was so ridiculous and unsupportable by the evidence that it could never survive open debate and the free-flow of information and opinion. If you can't win a debate then don't have one is the Cult's approach throughout history. Facebook's little boy front man – front boy – Mark Zuckerberg equated 'credible and accurate information' with official sources and exposing their lies with 'misinformation'. Silencing those that can see The censorship dynamic of Event 201 is now the norm with an army of narrative-supporting 'fact-checker' organisations whose entire reason for being is to tell the public that official narratives are true and those exposing them are lying. One of the most appalling of these 'fact-checkers' is called NewsGuard founded by ultra-Zionist Americans Gordon Crovitz and Steven Brill. Crovitz is a former publisher of The Wall Street Journal, former Executive Vice President of Dow Jones, a member of the Council on Foreign Relations (CFR), and on the board of the American Association of Rhodes Scholars. The CFR and Rhodes Scholarships, named after Rothschild agent Cecil Rhodes who plundered the gold and diamonds of South Africa for his masters and the Cult, have featured widely in my books. NewsGuard don't seem to like me for some reason – I really can't think why – and they have done all they can to have me censored and discredited which is, to quote an old British politician, like being savaged by a dead sheep. They are, however, like all in the censorship network, very well connected and funded by organisations themselves funded by, or connected to, Bill Gates. As you would expect with anything associated with Gates NewsGuard has an offshoot called HealthGuard which 'fights online health care hoaxes'. How very kind. Somehow the NewsGuard European Managing Director Anna-Sophie Harling, a remarkably young- looking woman with no broadcasting experience and little hands-on work in journalism, has somehow secured a position on the 'Content Board' of UK government broadcast censor Ofcom. An executive of an

organisation seeking to discredit dissidents of the official narratives is making decisions for the government broadcast 'regulator' about content?? Another appalling 'fact-checker' is Full Fact funded by George Soros and global censors Google and It's amazing how many activists in the 'fact-checking', 'anti-hate', arena turn up in government-related positions – people like UK Labour Party activist Imran Ahmed who heads the Center for Countering Digital Hate founded by people like Morgan McSweeney, now chief of staff to the Labour Party's hapless and useless 'leader' Keir Starmer. Digital Hate – which is what it really is – uses the American spelling of Center to betray its connection to a transatlantic network of similar organisations which in 2020 shapeshifted from attacking people for 'hate' to attacking them for questioning the 'Covid' hoax and the dangers of the 'Covid vaccine'. It's just a coincidence, you understand. This is one of Imran Ahmed's hysterical statements: 'I would go beyond calling anti-vaxxers conspiracy theorists to say they are an extremist group that pose a national security risk.' No one could ever accuse this prat of understatement and he's including in that those parents who are now against vaccines after their children were damaged for life or killed by them. He's such a nice man. Ahmed does the rounds of the Woke media getting softball questions from spineless 'journalists' who never ask what right he has to campaign to destroy the freedom of speech of others while he demands it for himself. There also seems to be an overrepresentation in Ofcom of people connected to the narrative-worshipping BBC. This incredible global network of narrative-support was super-vital when the 'Covid' hoax was played in the light of the mega-whopper lies that have to be defended from the spotlight cast by the most basic intelligence. Setting the scene The Cult plays the long game and proceeds step-by-step ensuring that everything is in place before major cards are played and they don't come any bigger than the 'Covid' hoax. The psychopaths can't handle events where the outcome isn't certain and as little as possible – preferably nothing – is left to chance. Politicians, government and medical officials who would follow direction were brought to illusory power in advance by the Cult web whether on the national stage or others like state governors and mayors of America. For decades the dynamic between officialdom, law enforcement and the

public was changed from one of service to one of control and dictatorship. Behaviour manipulation networks established within government were waiting to impose the coming 'Covid' rules and regulations specifically designed to subdue and rewire the psyche of the people in the guise of protecting health. These included in the UK the Behavioural Insights Team part-owned by the British government Cabinet Office; the Scientific Pandemic Insights Group on Behaviours (SPI-B); and a whole web of intelligence and military groups seeking to direct the conversation on social media and control the narrative. Among them are the cyberwarfare (on the people) 77th Brigade of the British military which is also coordinated through the Cabinet Office as civilian and military leadership continues to combine in what they call the Fusion Doctrine. The 77th Brigade is a British equivalent of the infamous Israeli (Sabbatian) military cyberwarfare and Internet manipulation operation Unit 8200 which I expose at length in *The Trigger*. Also carefully in place were the medical and science advisers to government – many on the payroll past or present of Bill Gates – and a whole alternative structure of unelected government stood by to take control when elected parliaments were effectively closed down once the 'Covid' card was slammed on the table. The structure I have described here and so much more was installed in every major country through the Cult networks. The top-down control hierarchy looks like this: The Cult – Cult-owned Gates – the World Health Organization and Tedros – Gates-funded or controlled chief medical officers and science 'advisers' (dictators) in each country – political 'leaders' – law enforcement – The People. Through this simple global communication and enforcement structure the policy of the Cult could be imposed on virtually the entire human population so long as they acquiesced to the fascism. With everything in place it was time for the button to be pressed in late 2019. These were the prime goals the Cult had to secure for its will to 1) Locking down economies, closing all but designated 'essential' businesses (Cult-owned corporations were 'essential'), and putting the population under house arrest was an imperative to destroy independent income and employment and ensure dependency on the Cult-controlled state in the Hunger Games Society. Lockdowns had to be established as the global blueprint from the start to respond to

the 'virus' and followed by preŕy much the 2) The global population had to be terrified into believing in a deadly 'virus' that didn't actually exist so they would unquestioningly obey authority in the belief that authority must know how best to protect them and their families. SoŒware salesman Gates would suddenly morph into the world's health expert and be promoted as such by the Cult-owned 3) A method of testing that wasn't testing for the 'virus', but was only claimed to be, had to be in place to provide the illusion of 'cases' and subsequent 'deaths' that had a very different cause to the 'Covid-19' that would be scribbled on the death certificate. 4) Because there was no 'virus' and the great majority testing positive with a test not testing for the 'virus' would have no symptoms of anything the lie had to be sold that people without symptoms (without the 'virus') could still pass it on to others. This was crucial to justify for the first time quarantining – house arresting – healthy people. Without this the economy-destroying lockdown of everybody could not have been credibly sold. 5) The 'saviour' had to be seen as a vaccine which beyond evil drug companies were working like angels of mercy to develop as quickly as possible, with all corners cut, to save the day. The public must absolutely not know that the 'vaccine' had nothing to do with a 'virus' or that the contents were ready and waiting with a very different motive long before the 'Covid' card was even liŒed from the pack. I said in March, 2020, that the 'vaccine' would have been created way ahead of the 'Covid' hoax which justified its use and the following December an article in the New York Intelligencer magazine said the Moderna 'vaccine' had been 'designed' by January, 2020. This was 'before China had even acknowledged that the disease could be transmiŒed from human to human, more than a week before the first confirmed coronavirus case in the United States'. The article said that by the time the first American death was announced a month later 'the vaccine had already been manufactured and shipped to the National Institutes of Health for the beginning of its Phase I clinical trial'. The 'vaccine' was actually 'designed' long before that although even with this timescale you would expect the article to ask how on earth it could have been done that quickly. Instead it asked why the 'vaccine' had not been rolled out then and not months later. Journalism in the mainstream is truly dead. I am going to detail in the

next chapter why the 'virus' has never existed and how a hoax on that scale was possible, but first the foundation on which the Big Lie of 'Covid' was built. The test that doesn't test Fraudulent 'testing' is the bottom line of the whole 'Covid' hoax and was the means by which a 'virus' that did not exist appeared to exist. They could only achieve this magic trick by using a test not testing for the 'virus'. To use a test that was testing for the 'virus' would mean that every test would come back negative given there was no 'virus'. They chose to exploit something called the RT-PCR test invented by American biochemist Kary Mullis in the 1980s who said publicly that his PCR test ... cannot detect infectious disease. Yes, the 'test' used worldwide to detect infectious 'Covid' to produce all the illusory 'cases' and 'deaths' compiled by Johns Hopkins and others cannot detect infectious disease. This fact came from the mouth of the man who invented PCR and was awarded the Nobel Prize in for the Cult, Mullis died in August, 2019, at the age of 74 just before his test would be fraudulently used to unleash fascism on the world. He was said to have died from pneumonia which was an irony in itself. A few months later he would have had 'Covid-19' on his death certificate. I say the timing of his death was convenient because had he lived Mullis, a brilliant, honest and decent man, would have been vociferously speaking out against the use of his test to detect 'Covid' when it was never designed, or able, to do that. I know that to be true given that Mullis made the same point when his test was used to 'detect' – not detect – HIV. He had been seriously critical of the Gallo/Montagnier claim to have isolated the HIV 'virus' and shown it to cause AIDS for which Mullis said there was no evidence. AIDS is actually not a disease but a series of diseases from which people die all the time. When they die from those same diseases after a positive 'test' for HIV then AIDS goes on their death certificate. I think I've heard that before somewhere. Countries instigated a policy with 'Covid' that anyone who tested positive with a test not testing for the 'virus' and died of any other cause within 28 days and even longer 'Covid-19' had to go on the death certificate. Cases have come from the test that can't test for infectious disease and the deaths are those who have died of anything after testing positive with a test not testing for the 'virus'. I'll have much more later about the death certificate scandal. Mullis



was deeply dismissive of the now US 'Covid' star Anthony Fauci who he said was a liar who didn't know anything about anything – 'and I would say that to his face – nothing.' He said of Fauci: 'The man thinks he can take a blood sample, put it in an electron microscope and if it's got a virus in there you'll know it – he doesn't understand electron microscopy and he doesn't understand medicine and shouldn't be in a position like he's in.' That position, terrifyingly, has made him the decider of 'Covid' fascism policy on behalf of the Cult in his role as director since 1984 of the National Institute of Allergy and Infectious Diseases (NIAID) while his record of being wrong is laughable; but being wrong, so long as it's the right kind of wrong, is why the Cult loves him. He'll say anything the Cult tells him to say. Fauci was made Chief Medical Adviser to the President immediately Biden took office. Biden was installed in the White House by Cult manipulation and one of his first decisions was to elevate Fauci to a position of even more control. This is a coincidence? Yes, and I identify as a flamenco dancer called Lola. How does such an incompetent criminal like Fauci remain in that pivotal position in American health since the 1980s? When you serve the Cult it looks aĝer you until you are surplus to requirements. Kary Mullis said prophetically of Fauci and his like: 'Those guys have an agenda and it's not an agenda we would like them to have ... they make their own rules, they change them when they want to, and Tony Fauci does not mind going on television in front of the people who pay his salary and lie directly into the camera.' Fauci has done that almost daily since the 'Covid' hoax began. Lying is in Fauci's DNA. To make the situation crystal clear about the PCR test this is a direct quote from its inventor Kary Mullis: It [the PCR test] doesn't tell you that you're sick and doesn't tell you that the thing you ended up with was really going to hurt you ...' Ask yourself why governments and medical systems the world over have been using this very test to decide who is 'infected' with the SARS-CoV-2 'virus' and the alleged disease it allegedly causes, 'Covid-19'. The answer to that question will tell you what has been going on. By the way, here's a liĝle show-stopper – the 'new' SARS- CoV-2 'virus' was 'identified' as such right from the start using ... the PCR test not testing for the 'virus'. If you are new to this and find that shocking then stick around. I have hardly started yet. Even worse, other 'tests', like

the 'Lateral Flow Device' (LFD), are considered so useless that they have to be confirmed by the PCR test! Leaked emails written by Ben Dyson, adviser to UK 'Health' Secretary Matt Hancock, said they were 'dangerously unreliable'. Dyson, executive director of strategy at the Department of Health, wrote: 'As of today, someone who gets a positive LFD result in (say) London has at best a 25 per cent chance of it being a true positive, but if it is a self-reported test potentially as low as 10 per cent (on an optimistic assumption about specificity) or as low as 2 per cent (on a more pessimistic assumption).' These are the 'tests' that schoolchildren and the public are being urged to have twice a week or more and have to isolate if they get a positive. Each fake positive goes in the statistics as a 'case' no matter how ludicrously inaccurate and the 'cases' drive lockdown, masks and the pressure to 'vaccinate'. The government said in response to the email leak that the 'tests' were accurate which confirmed yet again what shocking bloody liars they are. The real false positive rate is 100 percent as we'll see. In another 'you couldn't make it up' the UK government agreed to pay £2.8 billion to California's Innova Medical Group to supply the irrelevant lateral flow tests. The company's primary test-making centre is in China. Innova Medical Group, established in March, 2020, is owned by Pasaca Capital Inc, chaired by Chinese-American millionaire Charles Huang who was born in Wuhan.

How it works – and how it doesn't

The RT-PCR test, known by its full title of Polymerase chain reaction, is used across the world to make millions, even billions, of copies of a DNA/RNA genetic information sample. The process is called 'amplification' and means that a tiny sample of genetic material is amplified to bring out the detailed content. I stress that it is not testing for an infectious disease. It is simply amplifying a sample of genetic material. In the words of Kary Mullis: 'PCR is ... just a process that's used to make a whole lot of something out of something.' To emphasise the point companies that make the PCR tests circulated around the world to 'test' for 'Covid' warn on the box that it can't be used to detect 'Covid' or infectious disease and is for research purposes only. It's okay, rest for a minute and you'll be fine. This is the test that produces the 'cases' and 'deaths' that have been used to destroy human society. All those global and national medical and scientific 'experts' demanding this

destruction to 'save us' KNOW that the test is not testing for the 'virus' and the cases and deaths they claim to be real are an almost unimaginable fraud. Every one of them and so many others including politicians and psychopaths like Gates and Tedros must be brought before Nuremburg-type trials and jailed for the rest of their lives. The more the genetic sample is amplified by PCR the more elements of that material become sensitive to the test and by that I don't mean sensitive for a 'virus' but for elements of the genetic material which is naturally in the body or relates to remnants of old conditions of various kinds lying dormant and causing no disease. Once the amplification of the PCR reaches a certain level everyone will test positive. So much of the material has been made sensitive to the test that everyone will have some part of it in their body. Even lying criminals like Fauci have said that once PCR amplifications pass 35 cycles everything will be a false positive that cannot be trusted for the reasons I have described. I say, like many proper doctors and scientists, that 100 percent of the 'positives' are false, but let's just go with Fauci for a moment. He says that any amplification over 35 cycles will produce false positives and yet the US Centers for Disease Control (CDC) and Food and Drug Administration (FDA) have recommended up to 40 cycles and the National Health Service (NHS) in Britain admitted in an internal document for staff that it was using 45 cycles of and at least one 'testing' laboratory has been using 50 cycles. Have you ever heard a doctor, medical 'expert' or the media ask what level of amplification has been used to claim a 'positive'. The 'test' comes back 'positive' and so you have the 'virus', end of story. Now we can see how the government in Tanzania could send off samples from a goat and a pawpaw fruit under human names and both came back positive for 'Covid-19'. Tanzania president John Magufuli mocked the 'Covid' hysteria, the PCR test and masks and refused to import the DNA-manipulating 'vaccine'. The Cult hated him and an article sponsored by the Bill Gates Foundation appeared in the London Guardian in February, 2021, headed 'It's time for Africa to rein in Tanzania's anti-vaxxer president'. Well, 'reined in' he shortly was. Magufuli appeared in good health, but then, in March, 2021, he was dead at 61 from 'heart failure'. He was replaced by Samia Hassan Suhulu who is connected to Klaus Schwab's World Economic

Forum and she immediately reversed Magufuli's 'Covid' policy. A sample of cola tested positive for 'Covid' with the PCR test in Germany while American actress and singer-songwriter Erykah Badu tested positive in one nostril and negative in the other. Footballer Ronaldo called the PCR test 'bullshit' after testing positive three times and being forced to quarantine and miss matches when there was nothing wrong with him. The mantra from Tedros at the World Health Organization and national governments (same thing) has been test, test, test. They know that the more tests they can generate the more fake 'cases' they have which go on to become 'deaths' in ways I am coming to. The UK government has its Operation Moonshot planned to test multiple millions every day in workplaces and schools with free tests for everyone to use twice a week at home in line with the Cult plan from the start to make testing part of life. A government advertisement for an 'Interim Head of Asymptomatic Testing Communication' said the job included responsibility for delivering a 'communications strategy' (propaganda) 'to support the expansion of asymptomatic testing that 'normalises testing as part of everyday life'. More tests means more fake 'cases', 'deaths' and fascism. I have heard of, and from, many people who booked a test, couldn't turn up, and yet got a positive result through the post for a test they'd never even had. The whole thing is crazy, but for the Cult there's method in the madness. Controlling and manipulating the level of amplification of the test means the authorities can control whenever they want the number of apparent 'cases' and 'deaths'. If they want to justify more fascist lockdown and destruction of livelihoods they keep the amplification high. If they want to give the illusion that lockdowns and the 'vaccine' are working then they lower the amplification and 'cases' and 'deaths' will appear to fall. In January, 2021, the Cult-owned World Health Organization suddenly warned laboratories about over-amplification of the test and to lower the threshold. Suddenly headlines began appearing such as: 'Why ARE "Covid" cases plummeting?' This was just when the vaccine rollout was underway and I had predicted months before they would make cases appear to fall through amplification tampering when the 'vaccine' came. These people are so predictable. The question must be asked of what is on the test swabs being poked far up the nose of the

population to the base of the brain? A nasal swab punctured one woman's brain and caused it to leak fluid. Most of these procedures are being done by people with little training or medical knowledge. Dr Lorraine Day, former orthopaedic trauma surgeon and Chief of Orthopaedic Surgery at San Francisco General Hospital, says the tests are really a 'vaccine'. Cows have long been vaccinated this way. She points out that masks have to cover the nose and the mouth where it is claimed the 'virus' exists in saliva. Why then don't they take saliva from the mouth as they do with a DNA test instead of pushing a long swab up the nose towards the brain? The ethmoid bone separates the nasal cavity from the brain and within that bone is the cribriform plate. Dr Day says that when the swab is pushed up against this plate and twisted the procedure is 'depositing things back there'. She claims that among these 'things' are nanoparticles that can enter the brain. Researchers have noted that a team at the Gates-funded Johns Hopkins have designed tiny, star-shaped micro-devices that can latch onto intestinal mucosa and release drugs into the body. Mucosa is the thin skin that covers the inside surface of parts of the body such as the nose and mouth and produces mucus to protect them. The Johns Hopkins micro-devices are called 'theragrippers' and were 'inspired' by a parasitic worm that digs its sharp teeth into a host's intestines. Nasal swabs are also coated in the sterilisation agent ethylene oxide. The US National Cancer Institute posts this explanation on its website: At room temperature, ethylene oxide is a flammable colorless gas with a sweet odor. It is used primarily to produce other chemicals, including antifreeze. In smaller amounts, ethylene oxide is used as a pesticide and a sterilizing agent. The ability of ethylene oxide to damage DNA makes it an effective sterilizing agent but also accounts for its cancer-causing activity. The Institute mentions lymphoma and leukaemia as cancers most frequently reported to be associated with occupational exposure to ethylene oxide along with stomach and breast cancers. How does anyone think this is going to work out with the constant testing regime being inflicted on adults and children at home and at school that will accumulate in the body anything that's on the swab? Doctors know best It is vital for people to realise that 'hero' doctors 'know' only what the Big Pharma-dominated medical authorities tell

them to 'know' and if they refuse to 'know' what they are told to 'know' they are out the door. They are mostly not physicians or healers, but repeaters of the official narrative – or else. I have seen alleged professional doctors on British television make shocking statements that we are supposed to take seriously. One called 'Dr' Amir Khan, who is actually telling patients how to respond to illness, said that men could take the birth pill to 'help slow down the effects of Covid-19'. In March, 2021, another ridiculous 'Covid study' by an American doctor proposed injecting men with the female sex hormone progesterone as a 'Covid' treatment. British doctor Nighat Arif told the BBC that face coverings were now going to be part of ongoing normal. Yes, the vaccine protects you, she said (evidence?) ... but the way to deal with viruses in the community was always going to come down to hand washing, face covering and keeping a physical distance. That's not what we were told before the 'vaccine' was circulating. Arif said she couldn't imagine ever again going on the underground or in a lift without a mask. I was just thanking my good luck that she was not my doctor when she said – in March, she thought we could 'have our nearest and dearest around us at home ... around Christmas and New Year! Her patronising delivery was the usual school teacher talking to six-year-olds as she repeated every government talking point and probably believed them all. If we have learned anything from the 'Covid' experience surely it must be that humanity's perception of doctors needs a fundamental rethink. NHS 'doctor' Sara Kayat told her television audience that the 'Covid vaccine' would '100 percent prevent hospitalisation and death'. Not even Big Pharma claimed that. We have to stop taking 'experts' at their word without question when so many of them are clueless and only repeating the party line on which their careers depend. That is not to say there are not brilliant doctors – there are and I have spoken to many of them since all this began – but you won't see them in the mainstream media or quoted by the psychopaths and yes-people in government. Remember the name – Christian Drosten German virologist Christian Drosten, Director of Charité Institute of Virology in Berlin, became a national star after the pandemic hoax began. He was feted on television and advised the German government on 'Covid' policy. Most importantly to the wider world Drosten led a group that

produced the 'Covid' testing protocol for the PCR test. What a remarkable feat given the PCR cannot test for infectious disease and even more so when you think that Drosten said that his method of testing for SARS-CoV-2 was developed 'without having virus material available'. He developed a test for a 'virus' that he didn't have and had never seen. Let that sink in as you survey the global devastation that came from what he did. The whole catastrophe of Drosten's 'test' was based on the alleged genetic sequence published by Chinese scientists on the Internet. We will see in the next chapter that this alleged 'genetic sequence' has never been produced by China or anyone and cannot be when there is no SARS-CoV-2. Drosten, however, doesn't seem to let little details like that get in the way. He was the lead author with Victor Corman from the same Charité Hospital of the paper 'Detection of 2019 novel coronavirus (2019-nCoV) by real-time PCR' published in a magazine called Eurosurveillance. This became known as the Corman-Drosten paper. In November, 2020, with human society devastated by the effects of the Corman-Drosten test baloney, the protocol was publicly challenged by 22 international scientists and independent researchers from Europe, the United States, and Japan. Among them were senior molecular geneticists, biochemists, immunologists, and microbiologists. They produced a document headed 'External peer review of the RTPCR test to detect SARS-Cov-2 Reveals 10 Major Flaws At The Molecular and Methodological Level: Consequences For False-Positive Results'. The flaws in the Corman-Drosten test included the following: The test is non-specific because of erroneous design Results are enormously variable The test is unable to discriminate between the whole 'virus' and It doesn't have positive or negative controls The test lacks a standard operating procedure It is unsupported by proper peer view The scientists said the PCR 'Covid' testing protocol was not founded on science and they demanded the Corman-Drosten paper be retracted by Eurosurveillance. They said all present and previous Covid deaths, cases, and 'infection rates' should be subject to a massive retroactive inquiry. Lockdowns and travel restrictions should be reviewed and relaxed and those diagnosed through PCR to have 'Covid-19' should not be forced to isolate. Dr Kevin Corbett, a health researcher and nurse educator with a long academic career producing a

stream of peer-reviewed publications at many UK universities, made the same point about the PCR test debacle. He said of the scientists' conclusions: 'Every scientific rationale for the development of that test has been totally destroyed by this paper. It's like Hiroshima/Nagasaki to the Covid test.' He said that China hadn't given them an isolated 'virus' when Drosten developed the test. Instead they had developed the test from a sequence in a gene bank.' Put another way ... they made it up! The scientists were supported in this contention by a Portuguese appeals court which ruled in November, 2020, that PCR tests are unreliable and it is unlawful to quarantine people based solely on a PCR test. The point about China not providing an isolated virus must be true when the 'virus' has never been isolated to this day and the consequences of that will become clear. Drosten and company produced this useless 'protocol' right on cue in January, 2020, just as the 'virus' was said to be moving westward and it somehow managed to successfully pass a peer-review in 24 hours. In other words there was no peer-review for a test that would be used to decide who had 'Covid' and who didn't across the world. The Cult-created, Gates-controlled World Health Organization immediately recommended all its nearly 200 member countries to use the Drosten PCR protocol to detect 'cases' and 'deaths'. The sting was underway and it continues to this day. So who is this Christian Drosten that produced the means through which death, destruction and economic catastrophe would be justified? His education background, including his doctoral thesis, would appear to be somewhat shrouded in mystery and his track record is dire as with another essential player in the 'Covid' hoax, the Gates-funded Professor Neil Ferguson at the Gates-funded Imperial College in London of whom more shortly. Drosten predicted in 2003 that the alleged original SARS 'virus' (SARS-1) was an epidemic that could have serious effects on economies and an effective vaccine would take at least two years to produce. Drosten's answer to every alleged 'outbreak' is a vaccine which you won't be shocked to know. What followed were just 774 official deaths worldwide and none in Germany where there were only nine cases. That is even if you believe there ever was a SARS 'virus' when the evidence is zilch and I will expand on this in the next chapter. Drosten claims to be co-discoverer of 'SARS-1'



and developed a test for it in 2003. He was screaming warnings about 'swine flu' in 2009 and how it was a widespread infection far more severe than any dangers from a vaccine could be and people should get vaccinated. It would be helpful for Drosten's vocal chords if he simply recorded the words 'the virus is deadly and you need to get vaccinated' and copies could be handed out whenever the latest made-up threat comes along. Drosten's swine flu epidemic never happened, but Big Pharma didn't mind with governments spending hundreds of millions on vaccines that hardly anyone bothered to use and many who did wished they hadn't. A study in 2010 revealed that the risk of dying from swine flu, or H1N1, was no higher than that of the annual seasonal flu which is what at least most of 'it' really was as in the case of 'Covid-19'. A media investigation into Drosten asked how with such a record of inaccuracy he could be the government adviser on these issues. The answer to that question is the same with Drosten, Ferguson and Fauci – they keep on giving the authorities the 'conclusions' and 'advice' they want to hear. Drosten certainly produced the goods for them in January, 2020, with his PCR protocol garbage and provided the foundation of what German internal medicine specialist Dr Claus Köhnlein, co-author of Virus Mania, called the 'test pandemic'. The 22 scientists in the Eurosurveillance challenge called out conflicts of interest within the Drosten 'protocol' group and with good reason. Olfert Landt, a regular co-author of Drosten 'studies', owns the biotech company TIB Molbiol Syntheselabor GmbH in Berlin which manufactures and sells the tests that Drosten and his mates come up with. They have done this with SARS, Enterotoxigenic E. coli (ETEC), MERS, Zika 'virus', yellow fever, and now 'Covid'. Landt told the Berliner Zeitung The testing, design and development came from the Charité [Drosten and Corman]. We simply implemented it immediately in the form of a kit. And if we don't have the virus, which originally only existed in Wuhan, we can make a synthetic gene to simulate the genome of the virus. That's what we did very quickly. This is more confirmation that the Drosten test was designed without access to the 'virus' and only a synthetic simulation which is what SARS-CoV-2 really is – a computer-generated synthetic fiction. It's quite an enterprise they have going here. A Drosten team decides what the test for something should be and

Landt's biotech company flogs it to governments and medical systems across the world. His company must have made an absolute fortune since the 'Covid' hoax began. Dr Reiner Fuellmich, a prominent German consumer protection trial lawyer in Germany and California, is on Drosten's case and that of Tedros at the World Health Organization for crimes against humanity with a class-action lawsuit being prepared in the United States and other legal action in Germany. Scamming the world with a 'virus' that doesn't exist would seem impossible on the face of it, but not if you have control of the relatively few people that make policy decisions and the great majority of the global media. Remember it's not about changing 'real' reality it's about controlling perception of reality. You don't have to make something happen you only have make people believe that it's happening. Renegade Minds understand this and are therefore much harder to swindle. 'Covid-19' is not a 'real' 'virus'. It's a mind virus, like a computer virus, which has infected the minds, not the bodies, of billions. It all started, publically at least, in China and that alone is of central significance. The Cult was behind the revolution led by its asset Mao Zedong, or Chairman Mao, which established the People's Republic of China on October 1st, 1949. It should have been called The Cult's Republic of China, but the name had to reflect the recurring illusion that vicious dictatorships are run by and for the people (see all the 'Democratic Republics' controlled by tyrants). In the same way we have the 'Biden' Democratic Republic of America officially ruled by a puppet tyrant (at least temporarily) on behalf of Cult tyrants. The creation of Mao's merciless communist/fascist dictatorship was part of a frenzy of activity by the Cult at the conclusion of World War Two which, like the First World War, it had instigated through its assets in Germany, Britain, France, the United States and elsewhere. Israel was formed in 1948; the Soviet Union expanded its 'Iron Curtain' control, influence and military power with the Warsaw Pact communist alliance in 1955; the United Nations was formed in 1945 as a Cult precursor to world government; and a long list of world bodies would be established including the World Health Organization (1948), World Trade Organization (1948 under another name until 1995), International Monetary Fund (1945) and World Bank (1944). Human society was redrawn and hugely

centralised in the global Problem-Reaction- Solution that was World War Two. All these changes were significant. Israel would become the headquarters of the Sabbatians and the revolution in China would prepare the ground and control system for the events of 2019/2020. Renegade Minds know there are no borders except for public consumption. The Cult is a seamless, borderless global entity and to understand the game we need to put aside labels like borders, nations, countries, communism, fascism and democracy. These delude the population into believing that countries are ruled within their borders by a government of whatever shade when these are mere agencies of a global power. America's illusion of democracy and China's communism/fascism are subsidiaries – vehicles – for the same agenda. We may hear about conflict and competition between America and China and on the lower levels that will be true; but at the Cult level they are branches of the same company in the way of the McDonald's example I gave earlier. I have tracked in the books over the years support by US governments of both parties for Chinese Communist Party infiltration of American society through allowing the sale of land, even military facilities, and the acquisition of American business and university influence. All this is underpinned by the infamous stealing of intellectual property and technological know-how. Cult-owned Silicon Valley corporations waive their fraudulent 'morality' to do business with human-rights- free China; Cult-controlled Disney has become China's PR department; and China in effect owns 'American' sports such as basketball which depends for much of its income on Chinese audiences. As a result any sports player, coach or official speaking out against China's horrific human rights record is immediately condemned or fired by the China-worshipping National Basketball Association. One of the first acts of China-controlled Biden was to issue an executive order telling federal agencies to stop making references to the 'virus' by the 'geographic location of its origin'. Long-time Congressman Jerry Nadler warned that criticising China, America's biggest rival, leads to hate crimes against Asian people in the United States. So shut up you bigot. China is fast closing in on Israel as a country that must not be criticised which is apt, really, given that Sabbatians control them both. The two countries have developed close economic, military,

technological and strategic ties which include involvement in China's 'Silk Road' transport and economic initiative to connect China with Europe. Israel was the first country in the Middle East to recognise the establishment of Mao's tyranny in 1950 months after it was established.

Project Wuhan – the 'Covid' Psyop I emphasise again that the Cult plays the long game and what is happening to the world today is the result of centuries of calculated manipulation following a script to take control step-by-step of every aspect of human society. I will discuss later the common force behind all this that has spanned those centuries and thousands of years if the truth be told. Instigating the Mao revolution in China in 1949 with a 2020 'pandemic' in mind is not only how they work – the 71 years between them is really quite short by the Cult's standards of manipulation preparation. The reason for the Cult's Chinese revolution was to create a fiercely-controlled environment within which an extreme structure for human control could be incubated to eventually be unleashed across the world. We have seen this happen since the 'pandemic' emerged from China with the Chinese control- structure founded on AI technology and tyrannical enforcement sweep across the West. Until the moment when the Cult went for broke in the West and put its fascism on public display Western governments had to pay some lip-service to freedom and democracy to not alert too many people to the tyranny-in-the-making. Freedoms were more subtly eroded and power centralised with covert government structures put in place waiting for the arrival of 2020 when that smokescreen of 'freedom' could be dispensed with. The West was not able to move towards tyranny before 2020 anything like as fast as China which was created as a tyranny and had no limits on how fast it could construct the Cult's blueprint for global control. When the time came to impose that structure on the world it was the same Cult-owned Chinese communist/fascist government that provided the excuse – the 'Covid pandemic'. It was absolutely crucial to the Cult plan for the Chinese response to the 'pandemic' – draconian lockdowns of the entire population – to become the blueprint that Western countries would follow to destroy the livelihoods and freedom of their people. This is why the Cult- owned, Gates-owned, WHO Director-General Tedros said early on: The Chinese government is to be

congratulated for the extraordinary measures it has taken to contain the outbreak. China is actually setting a new standard for outbreak response and it is not an exaggeration. Forbes magazine said of China: '... those measures protected untold millions from geĵing the disease'. The Rockefeller Foundation 'epidemic scenario' document in 2010 said 'prophetically': However, a few countries did fare better – China in particular. The Chinese government's quick imposition and enforcement of mandatory quarantine for all citizens, as well as its instant and near-hermetic sealing off of all borders, saved millions of lives, stopping the spread of the virus far earlier than in other countries and enabling a swifter post-pandemic recovery. Once again – spooky. The first official story was the 'bat theory' or rather the bat diversion. The source of the 'virus outbreak' we were told was a "wet market" in Wuhan where bats and other animals are bought and eaten in horrifically unhygienic conditions. Then another story emerged through the alternative media that the 'virus' had been released on purpose or by accident from a BSL-4 (biosafety level 4) laboratory in Wuhan not far from the wet market. The lab was reported to create and work with lethal concoctions and bioweapons. Biosafety level 4 is the highest in the World Health Organization system of safety and containment. Renegade Minds are aware of what I call designer manipulation. The ideal for the Cult is for people to buy its prime narrative which in the opening salvoes of the 'pandemic' was the wet market story. It knows, however, that there is now a considerable worldwide alternative media of researchers sceptical of anything governments say and they are oĴen given a version of events in a form they can perceive as credible while misdirecting them from the real truth. In this case let them think that the conspiracy involved is a 'bioweapon virus' released from the Wuhan lab to keep them from the real conspiracy – there is no 'virus'. The WHO's current position on the source of the outbreak at the time of writing appears to be: 'We haven't got a clue, mate.' This is a good position to maintain mystery and bewilderment. The inner circle will know where the 'virus' came from – nowhere. The boĴom line was to ensure the public believed there was a 'virus' and it didn't much maĴer if they thought it was natural or had been released from a lab. The belief that there was a 'deadly virus' was all that was needed to

trigger global panic and fear. The population was were told. They had to or they were 'all gonna die'. In March, 2020, information began to come my way from real doctors and scientists and my own additional research which had my intuition screaming: 'Yes, that's it! There is no virus.' The 'bioweapon' was not the 'virus'; it was the 'vaccine' already being talked about that would be the bioweapon. My conclusion was further enhanced by happenings in Wuhan. The 'virus' was said to be sweeping the city and news footage circulated of people collapsing in the street (which they've never done in the West with the same 'virus'). The Chinese government was building 'new hospitals' in a matter of ten days to 'cope with demand' such was the virulent nature of the 'virus'. Yet in what seemed like no time the 'new hospitals' closed – even if they even opened – and China declared itself 'virus-free'. It was back to business as usual. This was more propaganda to promote the Chinese draconian lockdowns in the West as the way to 'beat the virus'. Trouble was that we subsequently had lockdown after lockdown, but never business as usual. As the people of the West and most of the rest of the world were caught in an ever-worsening spiral of lockdown, social distancing, masks, isolated old people, families forced apart, and livelihood destruction, it was party-time in Wuhan. Pictures emerged of thousands of people enjoying pool parties and concerts. It made no sense until you realised there never was a 'virus' and the whole thing was a Cult set-up to transform human society out of one its major global strongholds – China. How is it possible to deceive virtually the entire world population into believing there is a deadly virus when there is not even a 'virus' let alone a deadly one? It's nothing like as difficult as you would think and that's clearly true because it happened. Postscript: See end of book Postscript for more on the 'Wuhan lab virus release' story which the authorities and media were pushing heavily in the summer of 2021 to divert attention from the truth that the 'Covid virus' is pure invention. There is no 'virus' You can fool some of the people all of the time, and all of the people some of the time, but you cannot fool all of the people all of the time the greatest form of mind control is repetition. The more you repeat the same mantra of alleged 'facts' the more will accept them to be true. It becomes an 'everyone knows that, mate'. If you can also censor any other version

or alternative to your alleged 'facts' you are preÿ much home and cooking. By the start of 2020 the Cult owned the global mainstream media almost in its entirety to spew out its 'Covid' propaganda and ignore or discredit any other information and view. Cult-owned social media platforms in Cult-owned Silicon Valley were poised and ready to unleash a campaign of ferocious censorship to obliterate all but the official narrative. To complete the circle many demands for censorship by Silicon Valley were led by the mainstream media as 'journalists' became full-out enforcers for the Cult both as propagandists and censors. Part of this has been the influx of young people straight out of university who have become 'journalists' in significant positions. They have no experience and a headful of programmed perceptions from their years at school and university at a time when today's young are the most perceptually-targeted generations in known human history given the insidious impact of technology. They enter the media perceptually prepared and ready to repeat the narratives of the system that programmed them to repeat its narratives. The BBC has a truly pathetic 'specialist disinformation reporter' called Marianna Spring who fits this bill perfectly. She is clueless about the world, how it works and what is proper journalist would do and system-serving hacks like Spring wouldn't dare to do or even see the need to do. They are too busy licking the arse of authority which can never be wrong and, in the case of the BBC propaganda programme, Panorama, contacting payments systems such as PayPal to have a donations page taken down for a film company making documentaries questioning vaccines. Even the BBC soap opera EastEnders included a disgracefully biased scene in which an inarticulate white working class woman was made to look foolish for questioning the 'vaccine' while a well-spoken black man and Asian woman promoted the government narrative. It ticked every BBC box and the fact that the black and minority community was resisting the 'vaccine' had nothing to do with the way the scene was wriÿen. The BBC has become a disgusting tyrannical propaganda and censorship operation that should be defunded and disbanded and a free media take its place with a brief to stop censorship instead of demanding it. A BBC 'interview' with Gates goes something like: 'Mr Gates, sir, if I can call you

sir, would you like to tell our audience why you are such a great man, a wonderful humanitarian philanthropist, and why you should absolutely be allowed as a software salesman to decide health policy for approaching eight billion people? Thank you, sir, please sir.' Propaganda programming has been incessant and merciless and when all you hear is the same story from the media, repeated by those around you who have only heard the same story, is it any wonder that people on a grand scale believe absolute mendacious garbage to be true? You are about to see, too, why this level of information control is necessary when the official 'Covid' narrative is so nonsensical and unsupportable by the evidence.

Structure of Deceit

The pyramid structure through which the 'Covid' hoax has been manifested is very simple and has to be to work. As few people as possible have to be involved with full knowledge of what they are pyramid are the inner core of the Cult which controls Bill Gates who, in turn, controls the World Health Organization through his pivotal funding and his puppet Director-General mouthpiece, Tedros. Before he was appointed Tedros was chair of the Gates-founded Global Fund to 'fight against AIDS, tuberculosis and malaria', a board member of the Gates-funded 'vaccine alliance' GAVI, and on the board of another Gates-funded organisation. Gates owns him and picked him for a specific reason – Tedros is a crook and worse. 'Dr' Tedros (he's not a medical doctor, the first WHO chief not to be) was a member of the tyrannical Marxist government of Ethiopia for decades with all its human rights abuses. He has faced allegations of corruption and misappropriation of funds and was exposed three times for covering up cholera epidemics while Ethiopia's health minister. Tedros appointed the mass-murdering genocidal Zimbabwe dictator Robert Mugabe as a WHO goodwill ambassador for public health which, as with Tedros, is like appointing a psychopath to run a peace and love campaign. The move was so ridiculous that he had to drop Mugabe in the face of widespread condemnation. American economist David Steinman, a Nobel peace prize nominee, lodged a complaint with the International Criminal Court in The Hague over alleged genocide by Tedros when he was Ethiopia's foreign minister. Steinman says Tedros was a 'crucial decision maker' who directed the actions of Ethiopia's security forces



from 2013 to 2015 and one of three officials in charge when those security services embarked on the 'killing' and 'torturing' of Ethiopians. You can see where Tedros is coming from and it's sobering to think that he has been the vehicle for Gates and the Cult to direct the global response to 'Covid'. Think about that. A psychopathic Cult dictates to psychopath Gates who dictates to psychopath Tedros who dictates how countries of the world must respond to a 'Covid virus' never scientifically shown to exist. At the same time psychopathic Cult-owned Silicon Valley information giants like Google, YouTube, Facebook and Twitter announced very early on that they would give the Cult/Gates/Tedros/WHO version of the narrative free advertising and censor those who challenged their intelligence-insulting, mendacious story. The next layer in the global 'medical' structure below the Cult, Gates and Tedros are the chief medical officers and science 'advisers' in each of the WHO member countries which means virtually all of them. Medical officers and arbiters of science (they're not) then take the WHO policy and recommended responses and impose them on their country's population while the political 'leaders' say they are deciding policy (they're clearly not) by 'following the science' on the advice of the 'experts' – the same medical officers and science 'advisers' (dictators). In this way with the rarest of exceptions the entire world followed the same policy of lockdown, people distancing, masks and 'vaccines' dictated by the psychopathic Cult, psychopathic Gates and psychopathic Tedros who we are supposed to believe give a damn about the health of the world population they are seeking to enslave. That, amazingly, is all there is to it in terms of crucial decision-making. Medical staff in each country then follow like sheep the dictates of the shepherds at the top of the national medical hierarchies – chief medical officers and science 'advisers' who themselves follow like sheep the shepherds of the World Health Organization and the Cult. Shepherds at the national level often have major funding and other connections to Gates and his Bill and Melinda Gates Foundation which carefully hands out money like confetti at a wedding to control the entire global medical system from the WHO down. Follow the money Christopher Whitty, Chief Medical Adviser to the UK Government at the centre of 'virus' policy, a senior adviser to the government's Scientific Advisory Group for Emergencies

(SAGE), and Executive Board member of the World Health Organization, was given a grant of \$40 million by the Bill and Melinda Gates Foundation for malaria research in Africa. The BBC described the unelected Whitty as 'the official who will probably have the greatest impact on our everyday lives of any individual policymaker in modern times' and so it turned out. What Gates and Tedros have said Whitty has done like his equivalents around the world. Patrick Vallance, co-chair of SAGE and the government's Chief Scientific Adviser, is a former executive of Big Pharma giant GlaxoSmithKline with its fundamental financial and business connections to Bill Gates. In September, 2020, it was revealed that Vallance owned a deferred bonus of shares in GlaxoSmithKline worth £600,000 while the company was 'developing' a 'Covid vaccine'. Move along now – nothing to see here – what could possibly be wrong with that? Imperial College in London, a major player in 'Covid' policy in Britain and elsewhere with its 'Covid-19' Response Team, is funded by Gates and has big connections to China while the now infamous Professor Neil Ferguson, the useless 'computer modeller' at Imperial College is also funded by Gates. Ferguson delivered the dramatically inaccurate excuse for the first lockdowns (much more in the next chapter). The Institute for Health Metrics and Evaluation (IHME) in the United States, another source of outrageously false 'Covid' computer models to justify lockdowns, is bankrolled by Gates who is a vehement promotor of lockdowns. America's version of Whitty and Vallance, the again now infamous Anthony Fauci, has connections to 'Covid vaccine' maker Moderna as does Bill Gates through funding from the Bill and Melinda Gates Foundation. Fauci is director of the National Institute of Allergy and Infectious Diseases (NIAID), a major recipient of Gates money, and they are very close. Deborah Birx who was appointed White House Coronavirus Response Coordinator in February, 2020, is yet another with ties to Gates. Everywhere you look at the different elements around the world behind the coordination and decision making of the 'Covid' hoax there is Bill Gates and his money. They include the World Health Organization; Centers for Disease Control (CDC) in the United States; National Institutes of Health (NIH) of Anthony Fauci; Imperial College and Neil Ferguson; the London School of Hygiene where Chris Whitty worked; Regulatory agencies like the UK

Medicines & Healthcare products Regulatory Agency (MHRA) which gave emergency approval for 'Covid vaccines'; Wellcome Trust; GAVI, the Vaccine Alliance; the Coalition for Epidemic Preparedness Innovations (CEPI); Johns Hopkins University which has compiled the false 'Covid' figures; and the World Economic Forum. A Nationalfile.com article said: Gates has a lot of pull in the medical world, he has a multi-million dollar relationship with Dr. Fauci, and Fauci originally took the Gates line supporting vaccines and casting doubt on [the drug hydroxychloroquine]. Coronavirus response team member Dr. Deborah Birx, appointed by former president Obama to serve as United States Global AIDS Coordinator, also sits on the board of a group that has received billions from Gates' foundation, and Birx reportedly used a disputed Bill Gates-funded model for the White House's Coronavirus effort. Gates is a big proponent for a population lockdown scenario for the Coronavirus outbreak. Another funder of Moderna is the Defense Advanced Research Projects Agency (DARPA), the technology-development arm of the Pentagon and one of the most sinister organisations on earth. DARPA had a major role with the CIA covert technology-funding operation In-Q-Tel in the development of Google and social media which is now at the centre of global censorship. Fauci and Gates are extremely close and openly admit to talking regularly about 'Covid' policy, but then why wouldn't Gates have a seat at every national 'Covid' table after his Foundation committed \$1.75 billion to the 'fight against Covid-19'. When passed through our Orwellian Translation Unit this means that he has bought and paid for the Cult- driven 'Covid' response worldwide. Research the major 'Covid' response personnel in your own country and you will find the same Gates funding and other connections again and again. Medical and science chiefs following World Health Organization 'policy' sit atop a medical hierarchy in their country of administrators, doctors and nursing staff. These 'subordinates' are told they must work and behave in accordance with the policy delivered from the 'top' of the national 'health' pyramid which is largely the policy delivered by the WHO which is the policy delivered by Gates and the Cult. The whole 'Covid' narrative has been imposed on medical staff by a climate of fear although great numbers don't even need that to comply. They do so through breathtaking

levels of ignorance and include doctors who go through life simply repeating what Big Pharma and their hierarchical masters tell them to say and believe. No wonder Big Pharma 'medicine' is one of the biggest killers on The same top-down system of intimidation operates with regard to the Cult Big Pharma cartel which also dictates policy through national and global medical systems in this way. The Cult and Big Pharma agendas are the same because the former controls and owns the latter. 'Health' administrators, doctors, and nursing staff are told to support and parrot the dictated policy or they will face consequences which can include being fired. How sad it's been to see medical staff meekly repeating and imposing Cult policy without question and most of those who can see through the deceit are only willing to speak anonymously off the record. They know what will happen if their identity is known. This has left the courageous few to expose the lies about the 'virus', face masks, overwhelmed hospitals that aren't, and the dangers of the 'vaccine' that isn't a vaccine. When these medical professionals and scientists, some renowned in their field, have taken to the Internet to expose the truth their articles, comments and videos have been deleted by Cult-owned Facebook, Twitter and YouTube. What a real head-shaker to see YouTube videos with leading world scientists and highly qualified medical specialists with an added link underneath to the notorious Cult propaganda website Wikipedia to find the 'facts' about the same HIV – the 'Covid' trial-run I'll give you an example of the consequences for health and truth that come from censorship and unquestioning belief in official narratives. The story was told by PCR inventor Kary Mullis in his book *Dancing Naked in the Mind Field*. He said that in 1984 he accepted as just another scientific fact that Luc Montagnier of France's Pasteur Institute and Robert Gallo of America's National Institutes of Health had independently discovered that a 'retrovirus' dubbed HIV (human immunodeficiency virus) caused AIDS. They were, after all, Mullis writes, specialists in retroviruses. This is how the medical and science pyramids work. Something is announced or assumed and then becomes an everybody-knows-that purely through repetition of the assumption as if it is fact. Complete crap becomes accepted truth with no supporting evidence and only repetition of the crap. This is how a 'virus' that doesn't

exist became the 'virus' that changed the world. The HIV-AIDS fairy story became a multi-billion pound industry and the media poured out propaganda terrifying the world about the deadly HIV 'virus' that caused the lethal AIDS. By then Mullis was working at a lab in Santa Monica, California, to detect retroviruses with his PCR test in blood virologist where he could find a reference for HIV being the cause of AIDS. 'You don't need a reference,' the virologist said ... 'Everybody knows it.' Mullis said he wanted to quote a reference in the report he source of such an important discovery when everyone else seemed to. The virologist suggested he cite a report by the Centers for Disease Control and Prevention (CDC) on morbidity and mortality. Mullis read the report, but it only said that an organism had been identified and did not say how. The report did not identify the original scientific work. Physicians, however, assumed (key recurring theme) that if the CDC was convinced that HIV caused AIDS then proof must exist. Mullis continues: I did computer searches. Neither Montagnier, Gallo, nor anyone else had published papers describing experiments which led to the conclusion that HIV probably caused AIDS. I read the papers in Science for which they had become well known as AIDS doctors, but all they had said there was that they had found evidence of a past infection by something which was probably HIV in some AIDS patients. They found antibodies. Antibodies to viruses had always been considered evidence of past disease, not present disease. Antibodies signaled that the virus had been defeated. The patient had saved himself. There was no indication in these papers that this virus caused a disease. They didn't show that everybody with the antibodies had the disease. In fact they found some healthy people with antibodies. Mullis asked why their work had been published if Montagnier and Gallo hadn't really found this evidence, and why had they been fighting so hard to get credit for the discovery? He says he was hesitant to write 'HIV is the probable cause of AIDS' until he found published evidence to support that. 'Tens of thousands of scientists research based on this idea,' Mullis writes. 'The reason had to be there somewhere; otherwise these people would not have allowed their research to seîle into one narrow channel of investigation.' He said he lectured about PCR at numerous meetings where people were always talking about HIV and

he asked them how they knew that HIV was the cause of AIDS: Everyone said something. Everyone had the answer at home, in the office, in some drawer. They all knew, and they would send me the papers as soon as they got back. But I never got any papers. Nobody ever sent me the news about how AIDS was caused by HIV. Eventually Mullis was able to ask Montagnier himself about the reference proof when he lectured in San Diego at the grand opening of the University of California AIDS Research Center. Mullis says this was the last time he would ask his question without showing anger. Montagnier said he should reference the CDC report. 'I read it', Mullis said, and it didn't answer the question. 'If Montagnier didn't know the answer who the hell did?' Then one night Mullis was driving when an interview came on National Public Radio with Peter Duesberg, a prominent virologist at Berkeley and a California Scientist of the Year. Mullis says he finally understood why he could not find references that connected HIV to AIDS – there weren't any! No one had ever proved that HIV causes AIDS even though it had spawned a multi-billion pound global industry and the media was repeating this as fact every day in their articles and broadcasts terrifying the shit out of people about AIDS and giving the impression that a positive test for HIV (see 'Covid') was a death sentence. Duesberg was a threat to the AIDS gravy train and the agenda that underpinned it. He was therefore abused and castigated after he told the Proceedings of the National Academy of Sciences there was no good evidence implicating the new 'virus'. Editors rejected his manuscripts and his research funds were deleted. Mullis points out that the CDC has defined AIDS as one of more than 30 diseases if accompanied by a positive result on a test that detects antibodies to HIV; but those same diseases are not defined as AIDS cases when antibodies are not detected: If an HIV-positive woman develops uterine cancer, for example, she is considered to have AIDS. If she is not HIV positive, she simply has uterine cancer. An HIV-positive man with tuberculosis has AIDS; if he tests negative he simply has tuberculosis. If he lives in Kenya or Colombia, where the test for HIV antibodies is too expensive, he is simply presumed to have the antibodies and therefore AIDS, and therefore he can be treated in the World Health Organization's clinic. It's the only medical help available in some places. And it's

free, because the countries that support WHO are worried about AIDS. Mullis accuses the CDC of continually adding new diseases (see ever more 'Covid symptoms') to the grand AIDS definition and of virtually doctoring the books to make it appear as if the disease continued to spread. He cites how in 1993 the CDC enormously broadened its AIDS definition and county health authorities were delighted because they received \$2,500 per year from the Federal government for every reported AIDS case. Ladies and gentlemen, I have just described, via Kary Mullis, the 'Covid pandemic' of 2020 and beyond. Every element is the same and it's been pulled off in the same way by the same networks. The 'Covid virus' exists? Okay – prove it. Er ... still waiting What Kary Mullis described with regard to 'HIV' has been repeated with 'Covid'. A claim is made that a new, or 'novel', infection has been found and the entire medical system of the world repeats that as fact exactly as they did with HIV and AIDS. No one in the mainstream asks rather relevant questions such as 'How do you know?' and 'Where is your proof?' The SARS-Cov-2 'virus' and the 'Covid-19 disease' became an overnight 'everybody-knows-that'. The origin could be debated and mulled over, but what you could not suggest was that 'SARS-Cov-2' didn't exist. That would be ridiculous. 'Everybody knows' the 'virus' exists. Well, I didn't for one along with American proper doctors like Andrew Kaufman and Tom Cowan and long-time American proper journalist Jon Rappaport. We dared to pursue the obvious and simple question: 'Where's the evidence?' The overwhelming majority in medicine, journalism and the general public did not think to ask that. After all, everyone knew there was a new 'virus'. Everyone was saying so and I heard it on the BBC. Some would eventually argue that the 'deadly virus' was nothing like as deadly as claimed, but few would venture into the realms of its very existence. Had they done so they would have found that the evidence for that claim had gone AWOL as with HIV causes AIDS. In fact, not even that. For something to go AWOL it has to exist in the first place and scientific proof for a 'SARS-Cov-2' can be filed under nothing, nowhere and zilch. Dr Andrew Kaufman is a board-certified forensic psychiatrist in New York State, a Doctor of Medicine and former Assistant Professor and Medical Director of Psychiatry at SUNY Upstate Medical University, and Medical Instructor of Hematology and Oncology at

the Medical School of South Carolina. He also studied biology at the Massachusetts Institute of Technology (MIT) and trained in Psychiatry at Duke University. Kaufman is retired from allopathic medicine, but remains a consultant and educator on natural healing. I saw a video of his very early on in the 'Covid' hoax in which he questioned claims about the 'virus' in the absence of any supporting evidence and with plenty pointing the other way. I did everything I could to circulate his work which I felt was asking the pivotal questions that needed an answer. I can recommend an excellent pull-together interview he did with the website The Last Vagabond entitled Dr Andrew Kaufman: Virus Isolation, Terrain Theory and Covid-19 and his website is [andrewkaufmanmd.com](http://andrewkaufmanmd.com). Kaufman is not only a forensic psychiatrist; he is forensic in all that he does. He always reads original scientific papers, experiments and studies instead of second-third-fourth-hand reports about the 'virus' in the media which are repeating the repeated repetition of the narrative. When he did so with the original Chinese 'virus' papers Kaufman realised that there was no evidence of a 'SARS-Cov-2'. They had never – from the start – shown it to exist and every repeat of this claim worldwide was based on the accepted existence of proof that was nowhere to be found – see Kary Mullis and HIV. Here we go Kaufman discovered that the Chinese authorities immediately concluded that the cause of an illness that broke out among about 200 initial patients in Wuhan was a 'new virus' when there were no grounds to make that conclusion. The alleged 'virus' was not isolated from other genetic material in their samples and then shown through a system known as Koch's postulates to be the causative agent of the illness. The world was told that the SARS-Cov-2 'virus' caused a disease they called 'Covid-19' which had 'flu-like' symptoms and could lead to respiratory problems and pneumonia. If it wasn't so tragic it would almost be funny. 'Flu-like' symptoms? Pneumonia? Respiratory disease? What in CHINA and particularly in Wuhan, one of the most polluted cities in the world with a resulting epidemic of respiratory disease?? Three hundred thousand people get pneumonia in China every year and there are nearly a billion cases worldwide of 'flu-like symptoms'. These have a whole range of causes – including pollution in Wuhan – but no other possibility was credibly considered in late 2019 when the



world was told there was a new and deadly 'virus'. The global prevalence of pneumonia and 'flu-like systems' gave the Cult networks unlimited potential to re-diagnose these other causes as the mythical 'Covid-19' and that is what they did from the very start. Kaufman revealed how Chinese medical and science authorities (all subordinates to the Cult-owned communist government) took genetic material from the lungs of only a few of the first patients. The material contained their own cells, bacteria, fungi and other microorganisms living in their bodies. The only way you could prove the existence of the 'virus' and its responsibility for the alleged 'Covid-19' was to isolate the virus from all the other material – a process also known as 'purification' – and then follow the postulates sequence developed in the late 19th century by German physician and bacteriologist Robert Koch which became the 'gold standard' for connecting an alleged causation agent to a disease:

1. The microorganism (bacteria, fungus, virus, etc.) must be present in every case of the disease and all patients must have the same symptoms. It must also not be present in healthy
2. The microorganism must be isolated from the host with the disease. If the microorganism is a bacteria or fungus it must be grown in a pure culture. If it is a virus, it must be purified (i.e. containing no other material except the virus particles) from a clinical sample.
3. The specific disease, with all of its characteristics, must be reproduced when the infectious agent (the purified virus or a pure culture of bacteria or fungi) is inoculated into a healthy, susceptible host.
4. The microorganism must be recoverable from the experimentally infected host as in step

Not one of these criteria has been met in the case of 'SARS-Cov-2' and 'Covid-19'. Not ONE. EVER. Robert Koch refers to bacteria and not viruses. What are called 'viral particles' are so minute (hence masks are useless by any definition) that they could only be seen after the invention of the electron microscope in the 1930s and can still only be observed through that means. American bacteriologist and virologist Thomas Milton Rivers, the so-called 'Father of Modern Virology' who was very significantly director of the Rockefeller Institute for Medical Research in the 1930s, developed a less stringent version of Koch's postulates to identify 'virus' causation known as 'Rivers criteria'. 'Covid' did not pass that process either. Some even doubt whether

any 'virus' can be isolated from other particles containing genetic material in the Koch method. Freedom of Information requests in many countries asking for scientific proof that the 'Covid virus' has been purified and isolated and shown to exist have all come back with a 'we don't have that' and when this happened with a request to the UK Department of Health they added this comment: However, outside of the scope of the [Freedom of Information Act] and on a discretionary basis, the following information has been advised to us, which may be of interest. Most infectious diseases are caused by viruses, bacteria or fungi. Some bacteria or fungi have the capacity to grow on their own in isolation, for example in colonies on a petri dish. Viruses are different in that they are what we call 'obligate pathogens' – that is, they cannot survive or reproduce without infecting a host ... .. For some diseases, it is possible to establish causation between a microorganism and a disease by isolating the pathogen from a patient, growing it in pure culture and reintroducing it to a healthy organism. These are known as 'Koch's postulates' and were developed in 1882. However, as our understanding of disease and different disease-causing agents has advanced, these are no longer the method for determining causation [Andrew Kaufman asks why in that case are there two published articles falsely claiming to satisfy Koch's postulates]. It has long been known that viral diseases cannot be identified in this way as viruses cannot be grown in 'pure culture'. When a patient is tested for a viral illness, this is normally done by looking for the presence of antigens, or viral genetic code in a host with molecular biology techniques [Kaufman asks how you could know the origin of these chemicals without having a pure culture for comparison]. For the record 'antigens' are defined so: Invading microorganisms have antigens on their surface that the human body can recognise as being foreign – meaning not belonging to it. When the body recognises a foreign antigen, lymphocytes (white blood cells) produce antibodies, which are complementary in shape to Notwithstanding that this is open to question in relation to 'SARS-Cov-2' the presence of 'antibodies' can have many causes and they are found in people that are perfectly well. Kary Mullis said: 'Antibodies ... had always been considered evidence of past disease, not present disease.' 'Covid' really is a computer 'virus' Where the UK Department of

Health statement says 'viruses' are now 'diagnosed' through a 'viral genetic code in a host with molecular biology techniques', they mean ... the PCR test which its inventor said cannot test for infectious disease. They have no credible method of connecting a 'virus' to a disease and we will see that there is no scientific proof that any 'virus' causes any disease or there is any such thing as a 'virus' in the way that it is described. Tenacious Canadian researcher Christine Massey and her team made some 40 Freedom of Information requests to national public health agencies in different countries asking for proof that SARS-CoV-2 has been isolated and not one of them could supply that information. Massey said of her request in Canada: 'Freedom of Information reveals Public Health Agency of Canada has no record of 'SARS-COV-2' isolation performed by anyone, anywhere, ever.' If you accept the comment from the UK Department of Health it's because they can't isolate a 'virus'. Even so many 'science' papers claimed to have isolated the 'Covid virus' until they were questioned and had to admit they hadn't. A reply from the Robert Koch Institute in Germany was typical: 'I am not aware of a paper which purified isolated SARS-CoV-2.' So what the hell was Christian Drosten and his gang using to design the 'Covid' testing protocol that has produced all the illusory Covid' cases and 'Covid' deaths when the head of the Chinese version of the CDC admitted there was a problem right from the start in that the 'virus' had never been isolated/purified? Breathe deeply: What they are calling 'Covid' is actually created by a computer program i.e. they made it up – er, that's it. They took lung fluid, with many sources of genetic material, from one single person alleged to be infected with Covid-19 by a PCR test which they claimed, without clear evidence, contained a 'virus'. They used several computer programs to create a model of a theoretical virus genome sequence from more than fifty-six million small sequences of RNA, each of an unknown source, assembling them like a puzzle with no known solution. The computer filled in the gaps with sequences from bits in the gene bank to make it look like a bat SARS-like coronavirus! A wave of the magic wand and poof, an in silico (computer-generated) genome, a scientific fantasy, was created. UK health researcher Dr Kevin Corbett made the same point with this analogy: ... It's like giving you a few bones and

saying that's your fish. It could be any fish. Not even a skeleton. Here's a few fragments of bones. That's your fish ... It's all from gene bank and the bits of the virus sequence that weren't there they made up. They synthetically created them to fill in the blanks. That's what genetics is; it's a code. So it's ABBBCCDDD and you're missing some what you think is EEE so you put it in. It's all synthetic. You just manufacture the bits that are missing. This is the end result of the geneticization of virology. This is basically a computer virus. Further confirmation came in an email exchange between British citizen journalist Frances Leader and the government's Medicines & Healthcare Products Regulatory Agency (the Gates-funded MHRA) which gave emergency permission for untested 'Covid vaccines' to be used. The agency admitted that the 'vaccine' is not based on an isolated 'virus', but comes from a computer-generated model. Frances Leader was naturally banned from Cult-owned fascist Twitter for making this exchange public. The process of creating computer-generated alleged 'viruses' is called 'in silico' or 'in silicon' – computer chips – and the term 'in silico' is believed to originate with biological experiments using only a computer in 1989. 'Vaccines' involved with 'Covid' are also produced 'in silico' or by computer not a natural process. If the original 'virus' is nothing more than a made-up computer model how can there be 'new variants' of something that never existed in the first place? They are not new 'variants'; they are new computer models only minutely different to the original program and designed to further terrify the population into having the 'vaccine' and submitting to fascism. You want a 'new variant'? Click, click, enter – there you go. Tell the medical profession that you have discovered a 'South African variant', 'UK variants' or a 'Brazilian variant' and in the usual HIV-causes-AIDS manner they will unquestioningly repeat it with no evidence whatsoever to support these claims. They will go on television and then repeating what they have been told to be true and knowing that any deviation from that would be career suicide. Big-time insiders will know it's a hoax, but much of the medical community is clueless about the way they are being played and themselves play the public 'coincidence' that AstraZeneca and Oxford University were conducting 'Covid vaccine trials' in the three countries – the UK, South Africa and Brazil – where the first three 'variants' were

claimed to have 'broken out'. Here's your 'virus' – it's a unicorn Dr Andrew Kaufman presented a brilliant analysis describing how the 'virus' was imagined into fake existence when he dissected an article published by Nature and written by 19 authors detailing alleged 'sequencing of a complete viral genome' of the 'new SARS-CoV-2 virus'. This computer-modelled in silico genome was used as a template for all subsequent genome sequencing experiments that resulted in the so-called variants which he said now number more than 6,000. The fake genome was constructed from more than 56 million individual short strands of RNA. Those little pieces were assembled into longer pieces by finding areas of overlapping sequences. The computer programs created over two million possible combinations from which the authors simply chose the longest one. They then compared this to a 'bat virus' and the computer 'alignment' rearranged the sequence and filled in the gaps! They called this computer-generated abomination the 'complete genome'. Dr Tom Cowan, a fellow medical author and collaborator with Kaufman, said such computer-generation constitutes scientific fraud and he makes this superb analogy: Here is an equivalency: A group of researchers claim to have found a unicorn because they found a piece of a hoof, a hair from a tail, and a snippet of a horn. They then add that information into a computer and program it to re-create the unicorn, and they then claim this computer re-creation is the real unicorn. Of course, they had never actually seen a unicorn so could not possibly have examined its genetic makeup to compare their samples with the actual unicorn's hair, hooves and horn. The researchers claim they decided which is the real genome of SARS-CoV-2 by 'consensus', sort of like a vote. Again, different computer programs will come up with different versions of the imaginary 'unicorn', so they come together as a group and decide which is the real This is how the 'virus' that has transformed the world was brought into fraudulent 'existence'. Extraordinary, yes, but as the Nazis said the bigger the lie the more will believe it. Cowan, however, wasn't finished and he went on to identify what he called the real blockbuster in the paper. He quotes this section from a paper written by virologists and published by the CDC and then explains what it Therefore, we examined the capacity of SARS-CoV-2 to infect and

replicate in several common primate and human cell lines, including human adenocarcinoma cells (A549), human liver cells (HUH 7.0), and human embryonic kidney cells (HEK-293T). In addition to Vero E6 and Vero CCL81 cells. ... Each cell line was inoculated at high multiplicity of infection and examined 24h post-infection. No CPE was observed in any of the cell lines except in Vero cells, which grew to greater than 10 to the 7th power at 24 h post-infection. In contrast, HUH 7.0 and 293T showed only modest viral replication, and A549 cells were incompatible with SARS CoV-2 infection. Cowan explains that when virologists attempt to prove infection they have three possible 'hosts' or models on which they can test. The first was humans. Exposure to humans was generally not done for ethical reasons and has never been done with SARS-CoV-2 or any coronavirus. The second possible host was animals. Cowan said that forgoing for a moment that they never actually use purified virus when exposing animals they do use solutions that they claim contain the virus. Exposure to animals has been done with SARS-CoV-2 in an experiment involving mice and this is what they found: None of the wild (normal) mice got sick. In a group of genetically-modified mice, a statistically insignificant number lost weight and had slightly bristled fur, but they experienced nothing like the illness called 'Covid-19'. Cowan said the third method – the one they mostly rely on – is to inoculate solutions they say contain the virus onto a variety of tissue cultures. This process had never been shown to kill tissue unless the sample material was starved of nutrients and poisoned as part of the process. Yes, incredibly, in tissue experiments designed to show the 'virus' is responsible for killing the tissue they starve the tissue of nutrients and add toxic drugs including antibiotics and they do not have control studies to see if it's the starvation and poisoning that is degrading the tissue rather than the 'virus' they allege to be in there somewhere. You want me to pinch you? Yep, I understand. Tom Cowan said this about the whole nonsensical farce as he explains what that quote from the CDC paper really means: The shocking thing about the above quote is that using their own methods, the virologists found that solutions containing SARS-CoV-2 – even in high amounts – were NOT, I repeat NOT, infective to any of the three human tissue cultures they tested. In plain English, this means

they proved, on their terms, that this 'new coronavirus' is not infectious to human beings. It is ONLY infective to monkey kidney cells, and only then when you add two potent drugs (gentamicin and amphotericin), known to be toxic to kidneys, to the mix. My friends, read this again and again. These virologists, published by the CDC, performed a clear proof, on their terms, showing that the SARS-CoV-2 virus is harmless to human beings. That is the only possible conclusion, but, unfortunately, this result is not even mentioned in their conclusion. They simply say they can provide virus stocks cultured only on monkey Vero cells, thanks for coming. Cowan concluded: 'If people really understood how this "science" was done, I would hope they would storm the gates and demand honesty, transparency and truth.' Dr Michael Yeadon, former Vice President and Chief Scientific Adviser at drug giant Pfizer has been a vocal critic of the 'Covid vaccine' and its potential for multiple harm. He said in an interview in April, 2021, that 'not one [vaccine] has the virus. He was asked why vaccines normally using a 'dead' version of a disease to activate the immune system were not used for 'Covid' and instead we had the synthetic methods of the 'mRNA Covid vaccine'. Yeadon said that to do the former 'you'd have to have some of [the virus] wouldn't you?' He added: 'No-one's got any – seriously.' Yeadon said that surely they couldn't have fooled the whole world for a year without having a virus, 'but oddly enough ask around – no one's got it'. He didn't know why with all the 'great labs' around the world that the virus had not been isolated – 'Maybe they've been too busy running bad PCR tests and vaccines that people don't need.' What is today called 'science' is not 'science' at all. Science is no longer what is, but whatever people can be manipulated to believe that it is. Real science has been hijacked by the Cult to dispense and produce the 'expert scientists' and contentions that suit the agenda of the Cult. How big-time this has happened with the 'Covid' hoax which is entirely based on fake science delivered by fake 'scientists' and fake 'doctors'. The human-caused climate change hoax is also entirely based on fake science delivered by fake 'scientists' and fake 'climate experts'. In both cases real scientists, climate experts and doctors have their views suppressed and deleted by the Cult-owned science establishment, media and Silicon Valley. This is the 'science' that politicians

claim to be 'following' and a common denominator of 'Covid' and climate are Cult psychopaths Bill Gates and his mate Klaus Schwab at the Gates- funded World Economic Forum. But, don't worry, it's all just a coincidence and absolutely nothing to worry about. Zzzzzzzz. What is a 'virus' REALLY? Dr Tom Cowan is one of many contesting the very existence of viruses let alone that they cause disease. This is understandable when there is no scientific evidence for a disease-causing 'virus'. German virologist Dr Stefan Lanka won a landmark case in 2017 in the German Supreme Court over his contention that there is no such thing as a measles virus. He had offered a big prize for anyone who could prove there is and Lanka won his case when someone sought to claim the money. There is currently a prize of more than 225,000 euros on offer from an Isolate Truth Fund for anyone who can prove the isolation of SARS-CoV-2 and its genetic substance. Lanka wrote in an article headed 'The Misconception Called Virus' that scientists think a 'virus' is causing tissue to become diseased and degraded when in fact it is the processes they are using which do that – not a 'virus'. Lanka has done an important job in making this point clear as Cowan did in his analysis of the CDC paper. Lanka says that all claims about viruses as disease-causing pathogens are wrong and based on 'easily recognisable, understandable and verifiable misinterpretations.' Scientists believed they were working with 'viruses' in their laboratories when they were really working with 'typical particles of specific dying tissues or cells ...' Lanka said that the tissue decaying process claimed to be caused by a 'virus' still happens when no alleged 'virus' is involved. It's the process that does the damage and not a 'virus'. The genetic sample is deprived of nutrients, removed from its energy supply through removal from the body and then doused in toxic antibiotics to remove any bacteria. He confirms again that establishment scientists do not (pinch me) conduct control experiments to see if this is the case and if they did nonsense. He adds that during the measles 'virus' court case he commissioned an independent laboratory to perform just such a control experiment and the result was that the tissues and cells died in the exact same way as with alleged 'infected' material. This is supported by a gathering number of scientists, doctors and researchers who reject what is called 'germ theory' or the belief in the body being infected



by contagious sources emitted by other people. Researchers Dawn Lester and David Parker take the same stance in their highly-detailed and sourced book *What Really Makes You Ill – Why everything you thought you knew about disease is wrong* which was recommended to me by a number of medical professionals genuinely seeking the truth. Lester and Parker say there is no provable scientific evidence to show that a 'virus' can be transmitted between people or people and animals or animals and The definition also claims that viruses are the cause of many diseases, as if this has been definitively proven. But this is not the case; there is no original scientific evidence that definitively demonstrates that any virus is the cause of any disease. The burden of proof for any theory lies with those who proposed it; but none of the existing documents provides 'proof' that supports the claim that 'viruses' are pathogens. Dr Tom Cowan employs one of his clever analogies to describe the process by which a 'virus' is named as the culprit for a disease when what is called a 'virus' is only material released by cells detoxing themselves from infiltration by chemical or radiation poisoning. The tidal wave of technologically-generated radiation in the 'smart' modern world plus all the toxic food and drink are causing this to happen more than ever. Deluded 'scientists' misread this as a gathering impact of what they wrongly label 'viruses'. Paper can infect houses Cowan said in an article for davidicke.com – with his tongue only mildly in his cheek – that he believed he had made a tremendous discovery that may revolutionise science. He had discovered that small bits of paper are alive, 'well alive-ish', can 'infect' houses, and then reproduce themselves inside the house. The result was that this explosion of growth in the paper inside the house causes the house to explode, blowing it to smithereens. His evidence for this new theory is that in the past months he had carefully examined many of the houses in his neighbourhood and found almost no scraps of paper on the lawns and surrounds of the house. There was an occasional stray label, but nothing more. Then he would return to these same houses a week or so later and with a few, not all of them, particularly the old and decrepit ones, he found to his shock and surprise they were littered with stray bits of paper. He knew then that the paper had infected these houses, made copies of itself, and blew up the house. A young boy on a

bicycle at one of the sites told him he had seen a demolition crew using dynamite to explode the house the previous week, but Cowan dismissed this as the idle thoughts of silly boys because 'I was on to something big'. He was on to how 'scientists' mistake genetic material in the detoxifying process for something they call a 'virus'. Cowan said of his house and paper story: If this sounds crazy to you, it's because it should. This scenario is obviously nuts. But consider this admittedly embellished, for effect, current viral theory that all scientists, medical doctors and virologists currently believe. He takes the example of the 'novel SARS-Cov2' virus to prove the point. First they take someone with an undefined illness called 'Covid-19' and don't even attempt to find any virus in their sputum. Never mind the scientists still describe how this 'virus', which they have not located attaches to a cell receptor, injects its genetic material, in 'Covid's' case, RNA, into the cell. The RNA once inserted exploits the cell to reproduce itself and makes 'thousands, nay millions, of copies of itself ... Then it emerges victorious to claim its If you were to look in the scientific literature for proof, actual scientific proof, that uniform SARS-CoV2 viruses have been properly isolated from the sputum of a sick person, that actual spike proteins could be seen protruding from the virus (which has not been found), you would find that such evidence doesn't exist. If you go looking in the published scientific literature for actual pictures, proof, that these spike proteins or any viral proteins are ever attached to any receptor embedded in any cell membrane, you would also find that no such evidence exists. If you were to look for a video or documented evidence of the intact virus injecting its genetic material into the body of the cell, reproducing itself and then emerging victorious by budding off the cell membrane, you would find that no such evidence exists. The closest thing you would find is electron micrograph pictures of cellular particles, possibly attached to cell debris, both of which to be seen were stained by heavy metals, a process that completely distorts their architecture within the living organism. This is like finding bits of paper stuck to the blown-up bricks, thereby proving the paper emerged by taking pieces of the bricks on its way out. The Enders baloney Cowan describes the 'Covid' story as being just as make-believe as his paper story and he charts back this fantasy to a

Nobel Prize winner called John Enders (1897-1985), an American biomedical scientist who has been dubbed 'The Father of Modern Vaccines'. Enders is claimed to have 'discovered' the process of the viral culture which 'proved' that a 'virus' caused measles. Cowan explains how Enders did this 'by using the EXACT same procedure that has been followed by every virologist to find and characterize every new virus since 1954'. Enders took throat swabs from children with measles and immersed them in 2ml of milk. Penicillin (100u/ml) and the antibiotic streptomycin (50,g/ml) were added and the whole mix was centrifuged – rotated at high speed to separate large cellular debris from small particles and molecules as with milk and cream, for example. Cowan says that if the aim is to find little particles of genetic material ('viruses') in the snot from children with measles it would seem that the last thing you would do is mix the snot with other material – milk –that also has genetic material. 'How are you ever going to know whether whatever you found came from the snot or the milk?' He points out that streptomycin is a 'nephrotoxic' or poisonous-to-the-kidney drug. You will see the relevance of that shortly. Cowan says that it gets worse, much worse, when Enders describes the culture medium upon which the virus 'grows': 'The culture medium consisted of bovine amniotic fluid (90%), beef embryo extract (5%), horse serum (5%), antibiotics and phenol red as an indicator of cell metabolism.' Cowan asks incredulously: 'Did he just say that the culture medium also contained fluids and tissues that are themselves rich sources of genetic material?' The genetic cocktail, or 'medium', is inoculated onto tissue and cells from rhesus monkey kidney tissue. This is where the importance of streptomycin comes in and currently-used antimicrobials and other drugs that are poisonous to kidneys and used in ALL modern viral cultures (e.g. gentamicin, streptomycin, and amphotericin). Cowan asks: 'How are you ever going to know from this witch's brew where any genetic material comes from as we now have five different sources of rich genetic material in our mix?' Remember, he says, that all genetic material, whether from monkey kidney tissues, bovine serum, milk, etc., is made from the exact same components. The same central question returns: 'How are you possibly going to know that it was the virus that killed the kidney tissue and not the toxic antibiotic and starvation rations on

which you are growing the tissue?' John Enders answered the question himself – you can't: A second agent was obtained from an uninoculated culture of monkey kidney cells. The cytopathic changes [death of the cells] it induced in the unstained preparations could not be distinguished with confidence from the viruses isolated from measles. The death of the cells ('cytopathic changes') happened in exactly the same manner, whether they inoculated the kidney tissue with the measles snot or not, Cowan says. 'This is evidence that the destruction of the tissue, the very proof of viral causation of illness, was not caused by anything in the snot because they saw the same destructive effect when the snot was not even used ... the cytopathic, i.e., cell-killing, changes come from the process of the culture itself, not from any virus in any snot, period.' Enders quotes in his 1957 paper a virologist called Ruckle as reporting similar findings 'and in addition has isolated an agent from monkey kidney tissue that is so far indistinguishable from human measles virus'. In other words, Cowan says, these particles called 'measles viruses' are simply and clearly breakdown products of the starved and poisoned tissue. For measles 'virus' see all 'viruses' including the so-called 'Covid virus'. Enders, the 'Father of Modern Vaccines', also said: There is a potential risk in employing cultures of primate cells for the production of vaccines composed of attenuated virus, since the presence of other agents possibly latent in primate tissues cannot be definitely excluded by any known method. Cowan further quotes from a paper published in the journal *Viruses* in May, 2020, while the 'Covid pandemic' was well underway in the media if not in reality. 'EVs' here refers to particles of genetic debris from our own tissues, such as exosomes of which more in a moment: 'The remarkable resemblance between EVs and viruses has caused quite a few problems in the studies focused on the analysis of EVs released during viral infections.' Later the paper adds that to date a reliable method that can actually guarantee a complete separation (of EVs from viruses) DOES NOT EXIST. This was published at a time when a fairy tale 'virus' was claimed in total certainty to be causing a fairy tale 'viral disease' called 'Covid-19' – a fairy tale that was already well on the way to transforming human society in the image that the Cult has worked to achieve for so long. Cowan concludes his article: To summarize, there

is no scientific evidence that pathogenic viruses exist. What we think of as 'viruses' are simply the normal breakdown products of dead and dying tissues and cells. When we are well, we make fewer of these particles; when we are starved, poisoned, suffocated by wearing masks, or afraid, we make more. There is no engineered virus circulating and making people sick. People in laboratories all over the world are making genetically modified products to make people sick. These are called vaccines. There is no virome, no 'ecosystem' of viruses, viruses are not 8%, 50% or 100 % of our genetic material. These are all simply erroneous ideas based on the misconception called a virus. What is 'Covid'? Load of bollocks The background described here by Cowan and Lanka was emphasised in the first video presentation that I saw by Dr Andrew Kaufman when he asked whether the 'Covid virus' was in truth a natural defence mechanism of the body called 'exosomes'. These are released by cells when in states of toxicity – see the same themes returning over and over. They are released ever more profusely as chemical and radiation toxicity increases and think of the potential effect therefore of 5G alone as its destructive frequencies infest the human energetic information field with a gathering pace (5G went online in Wuhan in 2019 as the 'virus' emerged). I'll have more about this later. Exosomes transmit a warning to the rest of the body that 'Houston, we have a problem'. Kaufman presented images of exosomes and compared them with 'Covid' under an electron microscope and the similarity was remarkable. They both attach to the same cell receptors (claimed in the case of 'Covid'), contain the same genetic material in the form of RNA or ribonucleic acid, and both are found in 'viral cell cultures' with damaged or dying cells. James Hildreth MD, President and Chief Executive Officer of the Meharry Medical College at Johns Hopkins, said: 'The virus is fully an exosome in every sense of the word.' Kaufman's conclusion was that there is no 'virus': 'This entire pandemic is a completely manufactured crisis ... there is no evidence of anyone dying from [this] illness.' Dr Tom Cowan and Sally Fallon Morell, authors of *The Contagion Myth*, published a statement with Dr Kaufman in February, 2021, explaining why the 'virus' does not exist and you can read it that in full in the Appendix. 'Virus' theory can be traced to the 'cell theory' in 1858 of German physician Rudolf

Virchow (1821-1920) who contended that disease originates from a single cell infiltrated by a 'virus'. Dr Stefan Lanka said that findings and insights with respect to the structure, function and central importance of tissues in the creation of life, which were already known in 1858, comprehensively refute the cell theory. Virchow ignored them. We have seen the part later played by John Enders in the 1950s and Lanka notes that infection theories were only established as a global dogma through the policies and eugenics of the Third Reich in Nazi Germany (creation of the same Sabbatian cult behind the 'Covid' hoax). Lanka said: 'Before 1933, scientists dared to contradict this theory; after 1933, these critical scientists were silenced'. Dr Tom Cowan's view is that ill-health is caused by too much of something, too little of something, or toxification from chemicals and radiation – not contagion. We must also highlight as a major source of the 'virus' theology a man still called the 'Father of Modern Virology' – Thomas Milton Rivers (1888-1962). There is no way given the Cult's long game policy that it was a coincidence for the 'Father of Modern Virology' to be director of the Rockefeller Institute for Medical Research from 1937 to 1956 when he is credited with making the Rockefeller Institute a leader in 'viral research'. Cult Rockefellerers were the force behind the creation of Big Pharma 'medicine', established the World Health Organisation in 1948, and have long and close associations with the Gates family that now runs the WHO during the pandemic hoax through mega-rich Cult gofer and psychopath Bill Gates. Only a Renegade Mind can see through all this bullshit by asking the questions that need to be answered, not taking 'no' or prevarication for an answer, and certainly not hiding from the truth in fear of speaking it. Renegade Minds have always changed the world for the better and they will change this one no matter how bleak it may currently appear to be. Sequence of deceit If you tell the truth, you don't have to remember anything against the background that I have laid out this far the sequence that took us from an invented 'virus' in Cult-owned China in late 2019 to the fascist transformation of human society can be seen and understood in a whole new context. We were told that a deadly disease had broken out in Wuhan and the world media began its campaign (coordinated by behavioural psychologists as we shall see) to terrify the

population into unquestioning compliance. We were shown images of Chinese people collapsing in the street which never happened in the West with what was supposed to be the same condition. In the earliest days when alleged cases and deaths were few the fear register was hysterical in many areas of the media and this would expand into the common media narrative across the world. The real story was rather different, but we were never told that. The Chinese government, one of the Cult's biggest centres of global operation, said they had discovered a new illness with flu-like and pneumonia- type symptoms in a city with such toxic air that it is overwhelmed with flu-like symptoms, pneumonia and respiratory disease. Chinese scientists said it was a new – 'novel' – coronavirus which they called Sars-Cov-2 and that it caused a disease they labelled 'Covid-19'. There was no evidence for this and the 'virus' has never to this day been isolated, purified and its genetic code established from that. It was from the beginning a computer-generated fiction. Stories of Chinese whistleblowers saying the number of deaths was being suppressed or that the 'new disease' was related to the Wuhan bio-lab misdirected mainstream and alternative media into cul-de-sacs to obscure the real truth – there was no 'virus'. Chinese scientists took genetic material from the lung fluid of just a few people and said they had found a 'new' disease when this material had a wide range of content. There was no evidence for a 'virus' for the very reasons explained in the last two chapters. The 'virus' has never been shown to (a) exist and (b) cause any disease. People were diagnosed on symptoms that are so widespread in Wuhan and polluted China and with a PCR test that can't detect infectious disease. On this farce the whole global scam was sold to the rest of the world which would also diagnose respiratory disease as 'Covid-19' from symptoms alone or with a PCR test not testing for a 'virus'. Flu miraculously disappeared worldwide in 2020 and into 2021 as it was redesignated 'Covid-19'. It was really the same old flu with its 'flu-like' symptoms attributed to 'flu-like' 'Covid-19'. At the same time with very few exceptions the Chinese response of draconian lockdown and fascism was the chosen weapon to respond across the West as recommended by the Cult-owned Tedros at the Cult-owned World Health Organization run by the Cult-owned Gates. All was going according to plan. Chinese scientists

- everything in China is controlled by the Cult-owned government - compared their contaminated RNA lung-fluid material with other RNA sequences and said it appeared to be just under 80 percent identical to the SARS-CoV-1 'virus' claimed to be the cause of the SARS (severe acute respiratory syndrome) 'outbreak' in 2003. They decreed that because of this the 'new virus' had to be related and they called it SARS-CoV-2. There are some serious problems with this assumption and assumption was all it was. Most 'factual' science turns out to be assumptions repeated into everyone-knows-that. A match of under 80-percent is meaningless. Dr Kaufman makes the point that there's a 96 percent genetic correlation between humans and chimpanzees, but 'no one would say our genetic material is part of the chimpanzee family'. Yet the Chinese authorities were claiming that a much lower percentage, less than 80 percent, proved the existence of a new 'coronavirus'. For goodness sake human DNA is 60 percent similar to a banana. You are feeling sleepy The entire 'Covid' hoax is a global Psyop, a psychological operation to program the human mind into believing and fearing a complete fantasy. A crucial aspect of this was what appeared to happen in Italy. It was all very well streaming out daily images of an alleged catastrophe in Wuhan, but to the Western mind it was still on the other side of the world in a very different culture and seĭng. A reaction of 'this could happen to me and my family' was still nothing like as intense enough for the mind-doctors. The Cult needed a Western example to push people over that edge and it chose Italy, one of its major global locations going back to the Roman Empire. An Italian 'Covid' crisis was manufactured in a particular area called Lombardy which just happens to be notorious for its toxic air and therefore respiratory disease. Wuhan, China, déjà vu. An hysterical media told horror stories of Italians dying from 'Covid' in their droves and how Lombardy hospitals were being overrun by a tidal wave of desperately ill people needing treatment aĜer being struck down by the 'deadly virus'. Here was the psychological turning point the Cult had planned. Wow, if this is happening in Italy, the Western mind concluded, this indeed could happen to me and my family. Another point is that Italian authorities responded by following the Chinese blueprint so vehemently recommended by the Cult-owned World Health Organization. They



imposed fascistic lockdowns on the whole country viciously policed with the help of surveillance drones sweeping through the streets seeking out anyone who escaped from mass house arrest. Livelihoods were destroyed and psychology unravelled in the way we have witnessed since in all lockdown countries. Crucial to the plan was that Italy responded in this way to set the precedent of suspending freedom and imposing fascism in a 'Western liberal democracy'. I emphasised in an animated video explanation on davidicke.com posted in the summer of 2020 how important it was to the Cult to expand the Chinese lockdown model across the West. Without this, and the bare-faced lie that non-symptomatic people could still transmit a 'disease' they didn't have, there was no way locking down the whole population, sick and not sick, could be pulled off. At just the right time and with no evidence Cult operatives and gofers claimed that people without symptoms could pass on the 'disease'. In the name of protecting the 'vulnerable' like elderly people, who lockdowns would kill by the tens of thousands, we had for the first time healthy people told to isolate as well as the sick. The great majority of people who tested positive had no symptoms because there was nothing wrong with them. It was just a trick made possible by a test not testing for the Months

After my animated video the Gates-funded Professor Neil Ferguson at the Gates-funded Imperial College confirmed that I was right. He didn't say it in those terms, naturally, but he did say it. Ferguson will enter the story shortly for his outrageously crazy 'computer models' that led to Britain, the United States and many other countries following the Chinese and now Italian methods of response. Put another way, following the Cult script. Ferguson said that SAGE, the UK government's scientific advisory group which has controlled 'Covid' policy from the start, wanted to follow the Chinese lockdown model (while they all continued to work and be paid), but they wondered if they could possibly, in Ferguson's words, 'get away with it in Europe'. 'Get away with it'? Who the hell do these moronic, arrogant people think they are? This appalling man Ferguson said that once Italy went into national lockdown they realised they, too, could mimic China: It's a communist one-party state, we said. We couldn't get away with it in Europe, we thought ... and then Italy did it. And we realised we could. Behind this

garbage from Ferguson is a Ferguson's 'models' would play a central role in achieving that. It's just a coincidence, of course, and absolutely nothing to worry your little head about. Oops, sorry, our mistake. Once the Italian segment of the Psyop had done the job it was designed to do a very different story emerged. Italian authorities revealed that 99 percent of those who had 'died from Covid-19' in Italy had one, two, three, or more 'co-morbidities' or illnesses and health problems that could have ended their life. The US Centers for Disease Control and Prevention (CDC) published a figure of 94 percent for Americans dying of 'Covid' while having other serious medical conditions – on average two to three (some five or six) other potential causes of death. In terms of death from an unproven 'virus' I say it is 100 percent. The other one percent in Italy and six percent in the US would presumably have died from 'Covid's' flu-like symptoms with a range of other possible causes in conjunction with a test not testing for the 'virus'. Fox News reported that even more startling figures had emerged in one US county in which 410 of 422 deaths attributed to 'Covid-19' had other potentially deadly health conditions. The Italian National Health Institute said later that the average age of people dying with a 'Covid-19' diagnosis in Italy was about 81. Ninety percent were over 70 with ten percent over 90. In terms of other reasons to die some 80 percent had two or more chronic diseases with half having three or more including cardiovascular problems, diabetes, respiratory problems and cancer. Why is the phantom 'Covid-19' said to kill overwhelmingly old people and hardly affect the young? Old people continually die of many causes and especially respiratory disease which you can re-diagnose 'Covid-19' while young people die in tiny numbers by comparison and rarely of respiratory disease. Old people 'die of Covid' because they die of other things that can be redesignated 'Covid' and it really is that simple. Flu has flown. The blueprint was in place. Get your illusory 'cases' from a test not testing for the 'virus' and redesignate other causes of death as 'Covid-19'. You have an instant 'pandemic' from something that is nothing more than a computer-generated fiction. With near-on a billion people having 'flu-like' symptoms every year the potential was limitless and we can see why flu quickly and apparently miraculously disappeared worldwide by being diagnosed 'Covid-19'.

The painfully bloody obvious was explained away by the childlike media in headlines like this in the UK 'Independent': 'Not a single case of flu detected by Public Health England this year as Covid restrictions suppress virus'. I kid you not. The masking, social distancing and house arrest that did not make the 'Covid virus' disappear somehow did so with the 'flu virus'. Even worse the article, by a bloke called Samuel Love<sup>1</sup>, suggested that maybe the masking, sanitising and other 'Covid' measures should continue to keep the flu away. With a ridiculousness that disturbs your breathing (it's 'Covid-19') the said Love<sup>1</sup> wrote: 'With widespread social distancing and mask-wearing measures in place throughout the UK, the usual routes of transmission for influenza have been blocked.' He had absolutely no evidence to support that statement, but look at the consequences of him acknowledging the obvious. With flu not disappearing at all and only being relabelled 'Covid-19' he would have to contemplate that 'Covid' was a hoax on a scale that is hard to imagine. You need guts and commitment to truth to even go there and that's clearly something Samuel Love<sup>1</sup> does not have in abundance. He would never have got it through the editors anyway. Tens of thousands die in the United States alone every winter from flu including many with pneumonia complications. CDC figures record 45 million Americans diagnosed with flu in 2017-2018 of which 61,000 died and some reports claim 80,000. Where was the same hysteria then that we have seen with 'Covid-19'? Some 250,000 Americans are admitted to hospital with pneumonia every year with about 50,000 cases proving fatal. About 65 million suffer respiratory disease every year and three million deaths makes this the third biggest cause of death worldwide. You only have to redesignate a portion of all these people 'Covid-19' and you have an instant global pandemic or the appearance of one. Why would doctors do this? They are told to do this and all but a few dare not refuse those who must be obeyed. Doctors in general are not researching their own knowledge and instead take it direct and unquestioned from the authorities that own them and their careers. The authorities say they must now diagnose these symptoms 'Covid-19' and not flu, or whatever, and they do it. Dark suits say put 'Covid-19' on death certificates no matter what the cause of death and the doctors do it.

Renegade Minds don't fall for the illusion that doctors and medical staff are all highly-intelligent, highly-principled, seekers of medical truth. Some are, but not the majority. They are repeaters, gofers, and yes sir, no sir, purveyors of what the system demands they purvey. The 'Covid' con is not merely confined to diseases of the lungs. Instructions to doctors to put 'Covid-19' on death certificates for anyone dying of anything within 28 days (or much more) of a positive test not testing for the 'virus' opened the floodgates. The term dying with 'Covid' and not of 'Covid' was coined to cover the truth. Whether it was a with or an of they were all added to the death numbers attributed to the 'deadly virus' compiled by national governments and globally by the Gates-funded Johns Hopkins operation in the United States that was so involved in those 'pandemic' simulations. Fraudulent deaths were added to the ever-growing list of fraudulent 'cases' from false positives from a false test. No wonder Professor Walter Ricciardi, scientific advisor to the Italian minister of health, said after the Lombardy hysteria had done its job that 'Covid' death rates were due to Italy having the second oldest population in the world and to how hospitals record deaths: The way in which we code deaths in our country is very generous in the sense that all the people who die in hospitals with the coronavirus are deemed to be dying of the coronavirus. On re-evaluation by the National Institute of Health, only 12 per cent of death certificates have shown a direct causality from coronavirus, while 88 per cent of patients who have died have at least one pre-morbidity – many had two or three. This is extraordinary enough when you consider the propaganda campaign to use Italy to terrify the world, but how can they even say twelve percent were genuine when the 'virus' has not been shown to exist, its 'code' is a computer program, and diagnosis comes from a test not testing for it? As in China, and soon the world, 'Covid-19' in Italy was a redesignation of diagnosis. Lies and corruption were to become the real 'pandemic' fuelled by a pathetically-compliant medical system taking its orders from the tiny few at the top of their national hierarchy who answered to the World Health Organization which answers to Gates and the Cult. Doctors were told – ordered – to diagnose a particular set of symptoms 'Covid-19' and put that on the death certificate for any cause of death if the

patient had tested positive with a test not testing for the virus or had 'Covid' symptoms like the flu. The United States even introduced big financial incentives to manipulate the figures with hospitals receiving £4,600 from the Medicare system for diagnosing someone with regular pneumonia, \$13,000 if they made the diagnosis from the same symptoms 'Covid-19' pneumonia, and \$39,000 if they put a 'Covid' diagnosed patient on a ventilator that would almost certainly kill them. A few – painfully and pathetically few – medical whistleblowers revealed (before Cult-owned YouTube deleted their videos) that they had been instructed to 'let the patient crash' and put them straight on a ventilator instead of going through a series of far less intrusive and dangerous methods as they would have done before the pandemic hoax began and the financial incentives kicked in. We are talking cold-blooded murder given that ventilators are so damaging to respiratory systems they are usually the last step before heaven awaits. Renegade Minds never fall for the belief that people in white coats are all angels of mercy and cannot be full-on psychopaths. I have explained in detail in The Answer how what I am describing here played out across the world coordinated by the World Health Organization through the medical hierarchies in almost every country. Medical scientist calls it Information about the non-existence of the 'virus' began to emerge for me in late March, 2020, and mushroomed after that. I was sent an email by Sir Julian Rose, a writer, researcher, and organic farming promotor, from a medical scientist friend of his in the United States. Even at that early stage in March the scientist was able to explain how the 'Covid' hoax was being manipulated. He said there were no reliable tests for a specific 'Covid-19 virus' and nor were there any reliable agencies or media outlets for reporting numbers of actual 'Covid-19' cases. We have seen in the long period since then that he was absolutely right. 'Every action and reaction to Covid-19 is based on totally flawed data and we simply cannot make accurate assessments,' he said. Most people diagnosed with 'Covid-19' were showing nothing more than cold and flu-like symptoms 'because most coronavirus strains are nothing more than cold/flu-like symptoms'. We had farcical situations like an 84-year-old German man testing positive for 'Covid-19' and his nursing home ordered to quarantine only for him to be found to

have a common cold. The scientist described back then why PCR tests and what he called the 'Mickey Mouse test kits' were useless for what they were claimed to be identifying. 'The idea these kits can isolate a specific virus like Covid-19 is nonsense,' he said. Significantly, he pointed out that 'if you want to create a totally false panic about a totally false pandemic – pick a coronavirus'. This is exactly what the Cult-owned Gates, World Economic Forum and Johns Hopkins University did with their Event 201 'simulation' followed by their real-life simulation called the 'pandemic'. The scientist said that all you had to do was select the sickest of people with respiratory-type diseases in a single location – 'say Wuhan' – and administer PCR tests to them. You can then claim that anyone showing 'viral sequences' similar to a coronavirus 'which will inevitably be quite a few' is suffering from a flu. Since you already selected the sickest flu cases a fairly high proportion of your sample will go on to die. You can then say this 'new' virus has a CFR [case fatality rate] higher than the flu and use this to infuse more concern and do more tests which will of course produce more 'cases', which expands the testing, which produces yet more 'cases' and so on and so on. Before long you have your 'pandemic', and all you have done is use a simple test kit trick to convert the worst flu and pneumonia cases into something new that doesn't ACTUALLY EXIST. He said that you then 'just run the same scam in other countries' and make sure to keep the fear message running high 'so that people will feel panicky and less able to think critically'. The only problem to overcome was the fact there is no actual new deadly pathogen and only regular sick people. This meant that deaths from the 'new deadly pathogen' were going to be way too low for a real new deadly virus pandemic, but he said this could be overcome in the following ways – all of which would go on to happen: 1. You can claim this is just the beginning and more deaths are imminent [you underpin this with fantasy 'computer projections']. Use this as an excuse to quarantine everyone and then claim the quarantine prevented the expected millions of dead. 2. You can [say that people] 'minimizing' the dangers are irresponsible and bully them into not talking about numbers. 3. You can talk crap about made up numbers hoping to blind people with pseudoscience. 4. You can start testing well people (who, of course, will also likely have shreds of coronavirus [RNA]

in them) and thus inflate your 'case figures' with 'asymptomatic carriers' (you will of course have to spin that to sound deadly even though any virologist knows the more symptom-less cases you have the less deadly is your pathogen). The scientist said that if you take these simple steps 'you can have your own entirely manufactured pandemic up and running in weeks'. His analysis made so early in the hoax was brilliantly prophetic of what would actually unfold. Pulling all the information together in these recent chapters we have this is simple 1, 2, 3, of how you can delude virtually the entire human population into believing in a 'virus' that doesn't exist: A 'Covid case' is someone who tests positive with a test not testing for the 'virus'. A 'Covid death' is someone who dies of any cause within 28 days (or much longer) of testing positive with a test not testing for the Asymptomatic means there is nothing wrong with you, but they claim you can pass on what you don't have to justify locking down (quarantining) healthy people in totality. The foundations of the hoax are that simple. A study involving ten million people in Wuhan, published in November, 2020, demolished the whole lie about those without symptoms passing on the 'virus'. They found '300 asymptomatic cases' and traced their contacts to find that not one of them was detected with the 'virus'. 'Asymptomatic' patients and their contacts were isolated for no less than two weeks and nothing changed. I know it's all crap, but if you are going to claim that those without symptoms can transmit 'the virus' then you must produce evidence for that and they never have. Even World Health Organization official Dr Maria Van Kerkhove, head of the emerging diseases and zoonosis unit, said as early as June, 2020, that she doubted the validity of asymptomatic transmission. She said that 'from the data we have, it still seems to be rare that an asymptomatic person actually transmits onward to a secondary individual' and by 'rare' she meant that she couldn't cite any case of asymptomatic transmission. The Ferguson factor The problem for the Cult as it headed into March, 2020, when the script had lockdown due to start, was that despite all the manipulation of the case and death figures they still did not have enough people alleged to have died from 'Covid' to justify mass house arrest. This was overcome in the way the scientist described: 'You can claim this is just the beginning and more deaths are imminent ... Use this

as an excuse to quarantine everyone and then claim the quarantine prevented the expected millions of dead.’ Enter one Professor Neil Ferguson, the Gates-funded ‘epidemiologist’ at the Gates-funded Imperial College in London. Ferguson is Britain’s Christian Drosten in that he has a dire record of predicting health outcomes, but is still called upon to advise government on the next health outcome when another ‘crisis’ comes along. This may seem to be a strange and ridiculous thing to do. Why would you keep turning for policy guidance to people who have a history of being monumentally wrong? Ah, but it makes sense from the Cult point of view. These ‘experts’ keep on producing predictions that suit the Cult agenda for societal transformation and so it was with Neil Ferguson as he revealed his horrific (and clearly insane) computer model predictions that allowed lockdowns to be imposed in Britain, the United States and many other countries. Ferguson does not have even an A-level in biology and would appear to have no formal training in computer modelling, medicine or epidemiology, according to Derek Winton, an MSc in Computational Intelligence. He wrote an article somewhat aghast at what Ferguson did which included taking no account of respiratory disease ‘seasonality’ which means it is far worse in the winter months. Who would have thought that respiratory disease could be worse in the winter? Well, certainly The massively China-connected Imperial College and its bizarre professor provided the excuse for the long-incubated Chinese model of human control to travel westward at lightning speed. Imperial College confirms on its website that it collaborates with the Chinese Research Institute; publishes more than 600 research papers every year with Chinese research institutions; has 225 Chinese staff; 2,600 Chinese students – the biggest international group; 7,000 former students living in China which is the largest group outside the UK; and was selected for a tour by China’s President Xi Jinping during his state visit to the UK in 2015. The college takes major donations from China and describes itself as the UK’s number one university collaborator with Chinese research institutions. The China communist/fascist government did not appear phased by the woeful predictions of Ferguson and Imperial when during the lockdown that Ferguson induced the college signed a five-year collaboration deal



with China tech giant Huawei that will have Huawei's indoor 5G network equipment installed at the college's West London tech campus along with an 'AI cloud platform'. The deal includes Chinese sponsorship of Imperial's Venture Catalyst entrepreneurship competition. Imperial is an example of the enormous influence the Chinese government has within British and North American universities and research centres – and further afield. Up to 200 academics from more than a dozen UK universities are being investigated on suspicion of 'unintentionally' helping the Chinese government build weapons of mass destruction by 'transferring world-leading research in advanced military technology such as aircraft, missile designs and cyberweapons'. Similar scandals have broken in the United States, but it's all a coincidence. Imperial College serves the agenda in many other ways including the promotion of every aspect of the United Nations Agenda 21/2030 (the Great Reset) and produced computer models to show that human-caused 'climate change' is happening when in the real world it isn't. Imperial College is driving the climate agenda as it drives the 'Covid' agenda (both Cult hoaxes) while Patrick Vallance, the UK government's Chief Scientific Adviser on 'Covid', was named Chief Scientific Adviser to the UN 'climate change' conference known as COP26 hosted by the government in Glasgow, Scotland. 'Covid' and 'climate' are fundamentally connected. From Imperial's bosom came Neil Ferguson still advising government despite his previous disasters and it was announced early on that he and other key people like UK Chief Medical Adviser Chris Whitty had caught the 'virus' as the propaganda story was being sold. Somehow they managed to survive and we had Prime Minister Boris Johnson admitted to hospital with what was said to be a severe version of the 'virus' in this same period. His whole policy and demeanour changed when he returned to Downing Street. It's a small world with these government advisors – especially in their communal connections to Gates – and Ferguson had partnered with Whitty to write a paper called 'Infectious disease: Tough choices to reduce Ebola transmission' which involved another scare-story that didn't happen. Ferguson's 'models' predicted that up to 150,000 could die from 'mad cow disease', or BSE, and its version in sheep if it was transmitted to humans. BSE was not transmitted and instead triggered by an

organophosphate pesticide used to treat a pest on cows. Fewer than 200 deaths followed from the human form. Models by Ferguson and his fellow incompetents led to the unnecessary culling of millions of pigs, cattle and sheep in the foot and mouth outbreak in 2001 which destroyed the lives and livelihoods of farmers and their families who had often spent decades building their herds and flocks. Vast numbers of these animals did not have foot and mouth and had no contact with the infection. Another 'expert' behind the cull was Professor Roy Anderson, a computer modeller at Imperial College specialising in the epidemiology of human, not animal, disease. Anderson has served on the Bill and Melinda Gates Grand Challenges in Global Health advisory board and chairs another Gates-funded organisation. Gates is everywhere. In a precursor to the 'Covid' script Ferguson backed closing schools 'for prolonged periods' over the swine flu 'pandemic' in 2009 and said it would affect a third of the world population if it continued to spread at the speed he claimed to be happening. His mates at Imperial College said much the same and a news report said: 'One of the authors, the epidemiologist and disease modeller Neil Ferguson, who sits on the World Health Organisation's emergency committee for the outbreak, said the virus had "full pandemic potential".' Professor Liam Donaldson, the Chris Whitty of his day as Chief Medical Officer, said the worst case could see 30 percent of the British people infected by swine flu with 65,000 dying. Ferguson and Donaldson were indeed proved correct when at the end of the year the number of deaths attributed to swine flu was 392. The term 'expert' is rather liberally applied unfortunately, not least to complete idiots. Swine flu 'projections' were great for GlaxoSmithKline (GSK) as millions rolled in for its Pandemrix influenza vaccine which led to brain damage with children most affected. The British government (taxpayers) paid out more than £60 million in compensation after GSK was given immunity from prosecution. Yet another 'Covid' déjà vu. Swine flu was supposed to have broken out in Mexico, but Dr Wolfgang Wodarg, a German doctor, former member of parliament and critic of the 'Covid' hoax, observed 'the spread of swine flu' in Mexico City at the time. He said: 'What we experienced in Mexico City was a very mild flu which did not kill more than usual – which killed

even fewer people than usual.' Hyping the fear against all the facts is not unique to 'Covid' and has happened many times before. Ferguson is reported to have over-estimated the projected death toll of bird flu (H5N1) by some three million-fold, but bird flu vaccine makers again made a killing from the scare. This is some of the background to the Neil Ferguson who produced the perfectly-timed computer models in early 2020 predicting that half a million people would die in Britain without draconian lockdown and 2.2 million in the United States. Politicians panicked, people panicked, and lockdowns of alleged short duration were instigated to 'flatten the curve' of cases gleaned from a test not testing for the 'virus'. I said at the time that the public could forget the 'short duration' bit. This was an agenda to destroy the livelihoods of the population and force them into mass control through dependency and there was going to be nothing 'short' about it. American researcher Daniel Horowitz described the consequences of the 'models' spewed out by Gates-funded Ferguson and Imperial. What led our government and the governments of many other countries into panic was a single Imperial College of UK study, funded by global warming activists, that predicted 2.2 million deaths if we didn't lock down the country. In addition, the reported 8-9% death rate in Italy scared us into thinking there was some other mutation of this virus that they got, which might have come here. Together with the fact that we were finally testing and had the ability to actually report new cases, we thought we were headed for a death spiral. But again ... we can't flatten a curve if we don't know when the curve started. How about it never started? Giving them what they want. An investigation by German news outlet Welt Am Sonntag (World on Sunday) revealed how in March, 2020, the German government gathered together 'leading scientists from several research institutes and universities' and 'together, they were to produce a [modelling] paper that would serve as legitimization for further tough political measures'. The Cult agenda was justified by computer modelling not based on evidence or reality; it was specifically constructed to justify the Cult demand for lockdowns all over the world to destroy the independent livelihoods of the global population. All these modellers and everyone responsible for the 'Covid' hoax have a date with a trial like those in Nuremberg after

World War Two when Nazis faced the consequences of their war crimes. These corrupt-beyond-belief 'modellers' wrote the paper according to government instructions and it said that that if lockdown measures were lifted then up to one million Germans would die from 'Covid-19' adding that some would die 'agonizingly at home, gasping for breath' unable to be treated by hospitals that couldn't cope. All lies. No matter – it gave the Cult all that it wanted. What did long-time government 'modeller' Neil Ferguson say? If the UK and the United States didn't lockdown half a million would die in Britain and 2.2 million Americans. Anyone see a theme here? 'Modellers' are such a crucial part of the lockdown strategy that we should look into their background and follow the money. Researcher Rosemary Frei produced an excellent article headlined 'The Modelling-paper Mafiosi'. She highlights a guy called John Edmunds, a British epidemiologist, and professor in the Faculty of Epidemiology and Population Health at the London School of Hygiene & Tropical Medicine. He studied at Imperial College. Edmunds is a member of government 'Covid' advisory bodies which have been dictating policy, the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) and the Scientific Advisory Group for Ferguson, another member of NERVTAG and SAGE, led the way with the original 'virus' and Edmunds has followed in the 'variant' stage and especially the so-called UK or Kent variant known as the 'Variant of Concern' (VOC) B.1.1.7. He said in a co-written report for the Centre for Mathematical modelling of Infectious Diseases at the London School of Hygiene and Tropical Medicine, with input from the Centre's 'Covid-19' Working Group, that there was 'a realistic possibility that VOC B.1.1.7 is associated with an increased risk of death compared to non-VOC viruses'. Fear, fear, fear, get the vaccine, fear, fear, fear, get the vaccine. Rosemary Frei reveals that almost all the paper's authors and members of the modelling centre's 'Covid-19' Working Group receive funding from the Bill and Melinda Gates Foundation and/or the associated Gates-funded Wellcome Trust. The paper was published by e-journal MedRxiv which only publishes papers not peer-reviewed and the journal was established by an organisation headed by Facebook's Mark Zuckerberg and his missus. What a small world it is. Frei discovered that Edmunds is on the Scientific Advisory Board of the Coalition for Epidemic

Preparedness Innovations (CEPI) which was established by the Bill and Melinda Gates Foundation, Klaus Schwab's Davos World Economic Forum and Big Pharma giant Wellcome. CEPI was 'launched in Davos [in 2017] to develop vaccines to stop future epidemics', according to its website. 'Our mission is to accelerate the development of vaccines against emerging infectious diseases and enable equitable access to these vaccines for people during outbreaks.' What kind people they are. Rosemary Frei reveals that Public Health England (PHE) director Susan Hopkins is an author of her organisation's non-peer-reviewed reports on 'new variants'. Hopkins is a professor of infectious diseases at London's Imperial College which is gifted tens of millions of dollars a year by the Bill and Melinda Gates Foundation. Gates-funded modelling disaster Neil Ferguson also co-authors Public Health England reports and he spoke in December, 2020, about the potential danger of the B.1.1.7. 'UK variant' promoted by Gates-funded modeller John Edmunds. When I come to the 'Covid vaccines' the 'new variants' will be shown for what they are – bollocks. All these people and modellers are lockdown-obsessed or, put another way, they demand what the Cult demands. Edmunds said in January, 2021, that to ease lockdowns too soon would be a disaster and they had to 'vaccinate much, much, much more widely than the elderly'. Rosemary Frei highlights that Edmunds is married to Jeanne Pimenta who is described in a LinkedIn profile as director of epidemiology at GlaxoSmithKline (GSK) and she held shares in the company. Patrick Vallance, co-chair of SAGE and the government's Chief Scientific Adviser, is a former executive of GSK and has a deferred bonus of shares in the company worth £600,000. GSK has serious business connections with Bill Gates and is collaborating with mRNA-'vaccine' company CureVac to make 'vaccines' for the new variants that Edmunds is talking about. GSK is planning a 'Covid vaccine' with drug giant Sanofi. Puppet Prime Minister Boris Johnson announced in the spring of 2021 that up to 60 million vaccine doses were to be made at the GSK facility at Barnard Castle in the English North East. Barnard Castle, with a population of just 6,000, was famously visited in breach of lockdown rules in April, 2020, by Johnson aide Dominic Cummings who said that he drove there 'to test his eyesight' before driving back to London. Cummings would

be bejer advised to test his integrity – not that it would take long. The GSK facility had nothing to do with his visit then although I'm sure Patrick Vallance would have been happy to arrange an introduction and some tea and biscuits. Ruthless psychopath Gates has made yet another fortune from vaccines in collaboration with Big Pharma companies and gushes at the phenomenal profits to be made from vaccines – more than a 20-to-1 return as he told one interviewer. Gates also tweeted in December, 2019, with the foreknowledge of what was coming: 'What's next for our foundation? I'm particularly excited about what the next year could mean for one of the best buys in global health: vaccines.' Modeller John Edmunds is a big promotor of vaccines as all these people appear to be. He's the dean of the London School of Hygiene & Tropical Medicine's Faculty of Epidemiology and Population Health which is primarily funded by the Bill and Melinda Gates Foundation and the Gates-established and funded GAVI vaccine alliance which is the Gates vehicle to vaccinate the world. The organisation Doctors Without Borders has described GAVI as being 'aimed more at supporting drug-industry desires to promote new products than at finding the most efficient and sustainable means for fighting the diseases of poverty'. But then that's why the psychopath Gates created it. John Edmunds said in a video that the London School of Hygiene & Tropical Medicine is involved in every aspect of vaccine development including large-scale clinical trials. He contends that mathematical modelling can show that vaccines protect individuals and society. That's on the basis of shit in and shit out, I take it. Edmunds serves on the UK Vaccine Network as does Ferguson and the government's foremost 'Covid' adviser, the grim-faced, dark-eyed Chris Whitty. The Vaccine Network says it works 'to support the government to identify and shortlist targeted investment opportunities for the most promising vaccines and vaccine technologies that will help combat infectious diseases with epidemic potential, and to address structural issues related to the UK's broader vaccine infrastructure'. Ferguson is acting Director of the Imperial College Vaccine Impact Modelling Consortium which has funding from the Bill and Melina Gates Foundation and the Gates-created GAVI 'vaccine alliance'. Anyone wonder why these characters see vaccines as the answer to every problem? Ferguson is wildly

enthusiastic in his support for GAVI's campaign to vaccinate children en masse in poor countries. You would expect someone like Gates who has constantly talked about the need to reduce the population to want to fund vaccines to keep more people alive. I'm sure that's why he does it. The John Edmunds London School of Hygiene & Tropical Medicine (LSHTM) has a Vaccines Manufacturing Innovation Centre which develops, tests and commercialises vaccines. Rosemary Frei writes: The vaccines centre also performs affiliated activities like combating 'vaccine hesitancy'. The latter includes the Vaccine Confidence Project. The project's stated purpose is, among other things, 'to provide analysis and guidance for early response and engagement with the public to ensure sustained confidence in vaccines and immunisation'. The Vaccine Confidence Project's director is LSHTM professor Heidi Larson. For more than a decade she's been researching how to combat vaccine hesitancy. How the bloody hell can blokes like John Edmunds and Neil Ferguson with those connections and financial ties model 'virus' case and death projections for the government and especially in a way that gives their paymasters like Gates exactly what they want? It's insane, but this is what you find throughout the world. 'Covid' is not dangerous, oops, wait, yes it is Only days before Ferguson's nightmare scenario made Jackboot Johnson take Britain into a China-style lockdown to save us from a deadly 'virus' the UK government website gov.uk was reporting something very different to Ferguson on a page of official government guidance for 'high consequence infectious diseases (HCID)'. It said this about 'Covid-19': As of 19 March 2020, COVID-19 is no longer considered to be a high consequence infectious diseases (HCID) in the UK [my emphasis]. The 4 nations public health HCID group made an interim recommendation in January 2020 to classify COVID-19 as an HCID. This was based on consideration of the UK HCID criteria about the virus and the disease with information available during the early stages of the outbreak. Now that more is known about COVID-19, the public health bodies in the UK have reviewed the most up to date information about COVID-19 against the UK HCID criteria. They have determined that several features have now changed; in particular, more information is available about mortality rates (low overall), and there is now greater clinical awareness and a specific and

sensitive laboratory test, the availability of which continues to increase. The Advisory Committee on Dangerous Pathogens (ACDP) is also of the opinion that COVID-19 should no longer be classified as an HCID. Soon after the government had been exposed for downgrading the risk they upgraded it again and everyone was back to singing from the same Cult hymn book. Ferguson and his fellow Gates clones indicated that lockdowns and restrictions would have to continue until a Gates-funded vaccine was developed. Gates said the same because Ferguson and his like were repeating the Gates script which is the Cult script. 'Flatten the curve' became an ongoing nightmare of continuing lockdowns with periods in between of severe restrictions in pursuit of destroying independent incomes and had nothing to do with protecting health about which the Cult gives not a shit. Why wouldn't Ferguson be pushing a vaccine 'solution' when he's owned by vaccine-obsessive Gates who makes a fortune from them and when Ferguson heads the Vaccine Impact Modelling Consortium at Imperial College funded by the Gates Foundation and GAVI, the 'vaccine alliance', created by Gates as his personal vaccine promotion operation? To compound the human catastrophe that Ferguson's 'models' did so much to create he was later exposed for breaking his own lockdown rules by having sexual liaisons with his married girlfriend Antonia Staats at his home while she was living at another location with her husband and children. Staats was a 'climate' activist and senior campaigner at the Soros-funded Avaaz which I wouldn't trust to tell me that grass is green. Ferguson had to resign as a government advisor over this hypocrisy in May, 2020, but after a period of quiet he was back being quoted by the ridiculous media on the need for more lockdowns and a vaccine rollout. Other government-advising 'scientists' from Imperial College held the fort in his absence and said lockdown could be indefinite until a vaccine was found. The Cult script was being sung by the payrolled choir. I said there was no intention of going back to 'normal' when the 'vaccine' came because the 'vaccine' is part of a very different agenda that I will discuss in Human 2.0. Why would the Cult want to let the world go back to normal when destroying that normal forever was the whole point of what was happening? House arrest, closing businesses and schools



through lockdown, (un)social distancing and masks all followed the Ferguson fantasy models. Again as I predicted (these people are so predictable) when the 'vaccine' arrived we were told that house arrest, lockdown, (un)social distancing and masks would still have to continue. I will deal with the masks in the next chapter because they are of fundamental importance. Where's the 'pandemic'? Any mildly in-depth assessment of the figures revealed what was really going on. Cult-funded and controlled organisations still have genuine people working within them such as the number involved. So it is with Genevieve Briand, assistant program director of the Applied Economics master's degree program at Johns Hopkins University. She analysed the impact that 'Covid-19' had on deaths from all causes in the United States using official data from the CDC for the period from early February to early September, 2020. She found that allegedly 'Covid' related-deaths exceeded those from heart disease which she found strange with heart disease always the biggest cause of fatalities. Her research became even more significant when she noted the sudden decline in 2020 of all non-'Covid' deaths: 'This trend is completely contrary to the pattern observed in all previous years ... the total decrease in deaths by other causes almost exactly equals the increase in deaths by Covid-19.' This was such a game, set and match in terms of what was happening that Johns Hopkins University deleted the article on the grounds that it 'was being used to support false and dangerous inaccuracies about the impact of the pandemic'. No – because it exposed the scam from official CDC figures and this was confirmed when those figures were published in January, 2021. Here we can see the effect of people dying from heart attacks, cancer, road accidents and gunshot wounds – anything – having 'Covid-19' on the death certificate along with those diagnosed from 'symptoms' who had even not tested positive with a test not testing for the 'virus'. I am not kidding with the gunshot wounds, by the way. Brenda Bock, coroner in Grand County, Colorado, revealed that two gunshot victims tested positive for the 'virus' within the previous 30 days and were therefore classified as 'Covid deaths'. Bock said: 'These two people had tested positive for Covid, but that's not what killed them. A gunshot wound is what killed them.' She said she had not even finished her investigation when the state listed the gunshot

victims as deaths due to the 'virus'. The death and case figures for 'Covid-19' are an absolute joke and yet they are repeated like parrots by the media, politicians and alleged medical 'experts'. The official Cult narrative is the only show in town. Genevieve Briand found that deaths from all causes were not exceptional in 2020 compared with previous years and a Spanish magazine published figures that said the same about Spain which was a 'Covid' propaganda hotspot at one point. Discovery Salud, a health and medicine magazine, quoted government figures which showed how 17,000 fewer people died in Spain in 2020 than in 2019 and more than 26,000 fewer than in 2018. The age-standardised mortality rate for England and Wales when age distribution is taken into account was significantly lower in 2020 than the 1970s, 80s and 90s, and was only the ninth highest since 2000. Where is the Post mortems and autopsies virtually disappeared for 'Covid' deaths amid claims that 'virus-infected' bodily fluids posed a risk to those carrying out the autopsy. This was rejected by renowned German pathologist and forensic doctor Klaus Püschel who said that he and his staff had by then done 150 autopsies on 'Covid' patients with no problems at all. He said they were needed to know why some 'Covid' patients suffered blood clots and not severe respiratory infections. The 'virus' is, after all, called SARS or 'severe acute respiratory syndrome'. I highlighted in the spring of 2020 this phenomenon and quoted New York intensive care doctor Cameron Kyle-Sidell who posted a soon deleted YouTube video to say that they had been told to prepare to treat an infectious disease called 'Covid-19', but that was not what they were dealing with. Instead he likened the lung condition of the most severely ill patients to what you would expect with cabin depressurisation in a plane at 30,000 feet or someone dropped on the top of Everest without oxygen or acclimatisation. I have never said this is not happening to a small minority of alleged 'Covid' patients – I am saying this is not caused by a phantom 'contagious virus'. Indeed Kyle-Sidell said that 'Covid-19' was not the disease they were told was coming their way. 'We are operating under a medical paradigm that is untrue,' he said, and he believed they were treating the wrong disease: 'These people are being slowly starved of oxygen.' Patients would take off their oxygen masks in a state of

fear and stress and while they were blue in the face on the brink of death. They did not look like patients dying of pneumonia. You can see why they don't want autopsies when their virus doesn't exist and there is another condition in some people that they don't wish to be uncovered. I should add here that the 5G system of millimetre waves was being rapidly introduced around the world in 2020 and even more so now as they fire 5G at the Earth from satellites. At 60 gigahertz within the 5G range that frequency interacts with the oxygen molecule and stops people breathing in sufficient oxygen to be absorbed into the bloodstream. They are installing 5G in schools and hospitals. The world is not mad or anything. 5G can cause major changes to the lungs and blood as I detail in The Answer and these consequences are labelled 'Covid- 19', the alleged symptoms of which can be caused by 5G and other electromagnetic frequencies as cells respond to radiation poisoning. The 'Covid death' scam Dr Scoj Jensen, a Minnesota state senator and medical doctor, exposed 'Covid' Medicare payment incentives to hospitals and death certificate manipulation. He said he was sent a seven-page document by the US Department of Health 'coaching' him on how to fill out death certificates which had never happened before. The document said that he didn't need to have a laboratory test for 'Covid-19' to put that on the death certificate and that shocked him when death certificates are supposed to be about facts. Jensen described how doctors had been 'encouraged, if not pressured' to make a diagnosis of 'Covid-19' if they thought it was probable or 'presumed'. No positive test was necessary – not that this would have mattered anyway. He said doctors were told to diagnose 'Covid' by symptoms when these were the same as colds, allergies, other respiratory problems, and certainly with influenza which 'disappeared' in the 'Covid' era. A common sniffle was enough to get the dreaded verdict. Ontario authorities decreed that a single care home resident with one symptom from a long list must lead to the isolation of the entire home. Other courageous doctors like Jensen made the same point about death figure manipulation and how deaths by other causes were falling while 'Covid-19 deaths' were rising at the same rate due to re-diagnosis. Their videos rarely survive long on YouTube with its Cult-supporting algorithms courtesy of CEO Susan Wojcicki

and her bosses at Google. Figure-tampering was so glaring and ubiquitous that even officials were leŕing it slip or outright saying it. UK chief scientific adviser Patrick Vallance said on one occasion that 'Covid' on the death certificate doesn't mean 'Covid' was the cause of death (so why the hell is it there?) and we had the rare sight of a BBC reporter telling the truth when she said: 'Someone could be successfully treated for Covid, in say April, discharged, and then in June, get run over by a bus and die ... That person would still be counted as a Covid death in England.' Yet the BBC and the rest of the world media went on repeating the case and death figures as if they were real. Illinois Public Health Director Dr Ngozi Ezike revealed the deceit while her bosses must have been clenching their buŕjocks: If you were in a hospice and given a few weeks to live and you were then found to have Covid that would be counted as a Covid death. [There might be] a clear alternate cause, but it is still listed as a Covid death. So everyone listed as a Covid death doesn't mean that was the cause of the death, but that they had Covid at the time of death. Yes, a 'Covid virus' never shown to exist and tested for with a test not testing for the 'virus'. In the first period of the pandemic hoax through the spring of 2020 the process began of designating almost everything a 'Covid' death and this has continued ever since. I sat in a restaurant one night listening to a loud conversation on the next table where a family was discussing in bewilderment how a relative who had no symptoms of 'Covid', and had died of a long-term problem, could have been diagnosed a death by the 'virus'. I could understand their bewilderment. If they read this book they will know why this medical fraud has been perpetrated the world over. Some media truth shock The media ignored the evidence of death certificate fraud until eventually one columnist did speak out when she saw it first-hand. Bel Mooney is a long-time national newspaper journalist in Britain currently working for the Daily Mail. Her article on February 19th, 2021, carried this headline: 'My dad Ted passed three Covid tests and died of a chronic illness yet he's officially one of Britain's 120,000 victims of the virus and is far from alone ... so how many more are there?' She told how her 99-year-old father was in a care home with a long-standing chronic obstructive pulmonary disease and vascular dementia. Maybe, but he was still aware enough

to tell her from the start that there was no 'virus' and he refused the 'vaccine' for that reason. His death was not unexpected given his chronic health problems and Mooney said she was shocked to find that 'Covid-19' was declared the cause of death on his death certificate. She said this was a 'bizarre and unacceptable untruth' for a man with long-time health problems who had tested negative twice at the home for the 'virus'. I was also shocked by this story although not by what she said. I had been highlighting the death certificate manipulation for ten months. It was the confirmation that a professional full-time journalist only realised this was going on when it affected her directly and neither did she know that whether her dad tested positive or negative was irrelevant with the test not testing for the 'virus'. Where had she been? She said she did not believe in 'conspiracy theories' without knowing I'm sure that this and 'conspiracy theorists' were terms put into widespread circulation by the CIA in the 1960s to discredit those who did not accept the ridiculous official story of the Kennedy assassination. A blanket statement of 'I don't believe in conspiracy theories' is always bizarre. The dictionary definition of the term alone means the world is drowning in conspiracies. What she said was even more daft when her dad had just been affected by the 'Covid' conspiracy. Why else does she think that 'Covid-19' was going on the death certificates of people who died of something else? To be fair once she saw from personal experience what was happening she didn't mince words. Mooney was called by the care home on the morning of February 9th to be told her father had died in his sleep. When she asked for the official cause of death what came back was 'Covid-19'. Mooney challenged this and was told there had been deaths from Covid on the dementia floor (confirmed by a test not testing for the 'virus') so they considered it 'reasonable to assume'. 'But doctor,' Mooney rightly protested, 'an assumption isn't a diagnosis.' She said she didn't blame the perfectly decent and death on the death certificate and that is a criminal offence for which he should be brought to account and the same with the millions of their job they were following orders and that must not wash at new Nuremberg trials any more than it did at the first ones. Mooney's doctor was 'assuming' (presuming) as he was told to, but 'just following orders' makes no difference to his actions. A doctor's job is to

serve the patient and the truth, not follow orders, but that's what they have done all over the world and played a central part in making the 'Covid' hoax possible with all its catastrophic consequences for humanity. Shame on them and they must answer for their actions. Mooney said her disquiet worsened when she registered her father's death by telephone and was told by the registrar there had been very many other cases like hers where 'the deceased' had not tested positive for 'Covid' yet it was recorded as the cause of death. The test may not matter, but those involved at their level think it matters and it shows a callous disregard for accurate diagnosis. The pressure to do this is coming from the top of the national 'health' pyramids which in turn obey the World Health Organization which obeys Gates and the Cult. Mooney said the registrar agreed that this must distort the national figures adding that 'the strangest thing is that every winter we record countless deaths from flu, and this winter there have been none. Not one!' She asked if the registrar thought deaths from flu were being misdiagnosed and lumped together with 'Covid' deaths. The answer was a 'puzzled yes'. Mooney said that the funeral director said the same about 'Covid' deaths which had nothing to do with 'Covid'. They had lost count of the number of families upset by this and other funeral companies in different countries have had the same experience. Mooney wrote: The nightly shroud-waving and shocking close-ups of pain imposed on us by the TV news bewildered and terrified the population into eager compliance with lockdowns. We were invited to 'save the NHS' and to grieve for strangers – the real-life loved ones behind those shocking death counts. Why would the public imagine what I now fear, namely that the way Covid-19 death statistics are compiled might make the numbers seem greater than they are? Oh, just a little bit – like 100 percent. Do the maths Mooney asked why a country would wish to skew its mortality figures by wrongly certifying deaths? What had been going on? Well, if you don't believe in conspiracies you will never find the answer which is that it's a conspiracy. She did, however, describe what she had discovered as a 'national scandal'. In reality it's a global scandal and happening everywhere. Pillars of this conspiracy were all put into place before the confusion was pressed with the Drosten PCR protocol and high amplifications to produce the cases and

death certificate changes to secure illusory 'Covid' deaths. Mooney notes that normally two doctors were needed to certify a death, with one having to know the patient, and how the rules were changed in the spring of 2020 to allow one doctor to do this. In the same period 'Covid deaths' were decreed to be all cases where Covid-19 was put on the death certificate even without a positive test or any symptoms. Mooney asked: 'How many of the 30,851 (as of January 15) care home resident deaths with Covid-19 on the certificate (32.4 per cent of all deaths so far) were based on an assumption, like that of my father? And what has that done to our national psyche?' All of them is the answer to the first question and it has devastated and dismantled the national psyche, actually the global psyche, on a colossal scale. In the UK case and death data is compiled by organisations like Public Health England (PHE) and the Office for National Statistics (ONS). Mooney highlights the insane policy of counting a death from any cause as 'Covid-19' if this happens within 28 days of a positive test (with a test not testing for the 'virus') and she points out that ONS statistics reflect deaths 'involving Covid' 'or due to Covid' which meant in practice any death where 'Covid-19' was mentioned on the death certificate. She described the consequences of this fraud: Most people will accept the narrative they are fed, so panicky governments here and in Europe witnessed the harsh measures enacted in totalitarian China and jumped into lockdown. Headlines about Covid deaths tolled like the knell that would bring doomsday to us all. Fear stalked our empty streets. Politicians parroted the frankly ridiculous aim of 'zero Covid' and shut down the economy, while most British people agreed that lockdown was essential and (astonishingly to me, as a patriotic Brit) even wanted more restrictions. For what? Lies on death certificates? Never mind the grim toll of lives ruined, suicides, schools closed, rising inequality, depression, cancelled hospital treatments, cancer patients in a torture of waiting, poverty, economic devastation, loneliness, families kept apart, and so on. How many lives have been lost as a direct result of lockdown? She said that we could join in a national chorus of shock and horror at reaching the 120,000 death toll which was surely certain to have been totally skewed all along, but what about the human cost of lockdown justified by these 'death figures'? The British Medical Journal had

reported a 1,493 percent increase in cases of children taken to Great Ormond Street Hospital with abusive head injuries alone and then there was the effect on families: Perhaps the most shocking thing about all this is that families have been kept apart – and obeyed the most irrational, changing rules at the whim of government – because they believed in the statistics. They succumbed to fear, which his generation rejected in that war fought for freedom. Dad (God rest his soul) would be angry. And so am I. Another theme to watch is that in the winter months when there are more deaths from all causes they focus on 'Covid' deaths and in the summer when the British Lung Foundation says respiratory disease plummets by 80 percent they rage on about 'cases'. Either way fascism on population is always the answer. Nazi eugenics in the 21st century Elderly people in care homes have been isolated from their families month after lonely month with no contact with relatives and grandchildren who were banned from seeing them. We were told that lockdown fascism was to 'protect the vulnerable' like elderly people. At the same time Do Not Resuscitate (DNR) orders were placed on their medical files so that if they needed resuscitation it wasn't done and 'Covid-19' went on their death certificates. Old people were not being 'protected' they were being culled – murdered in truth. DNR orders were being decreed for disabled and young people with learning difficulties or psychological problems. The UK Care Quality Commission, a non-departmental body of the Department of Health and Social Care, found that 34 percent of those working in health and social care were pressured into placing 'do not attempt cardiopulmonary resuscitation' orders on 'Covid' patients who suffered from disabilities and learning difficulties without involving the patient or their families in the decision. UK judges ruled that an elderly woman with dementia should have the DNA-manipulating 'Covid vaccine' against her son's wishes and that a man with severe learning difficulties should have the jab despite his family's objections. Never mind that many had already died. The judiciary always supports doctors and government in fascist dictatorships. They wouldn't dare do otherwise. A horrific video was posted showing fascist officers from Los Angeles police forcibly giving the 'Covid' shot to women with special needs who were screaming that they didn't want it. The same fascists are seen giving the jab to a



sleeping elderly woman in a care home. This is straight out of the Nazi playbook. Hitler's Nazis committed mass murder of the mentally ill and physically disabled throughout Germany and occupied territories in the programme that became known as Aktion T4, or just T4. Sabbatian-controlled Hitler and his grotesque crazies set out to kill those they considered useless and unnecessary. The Reich Committee for the Scientific Registering of Hereditary and Congenital Illnesses registered the births of babies identified by physicians to have 'defects'. By 1941 alone more than 5,000 children were murdered by the state and it is estimated that in total the number of innocent people killed in Aktion T4 was between 275,000 and 300,000. Parents were told their children had been sent away for 'special treatment' never to return. It is rather pathetic to see claims about plans for new extermination camps being dismissed today when the same force behind current events did precisely that 80 years ago. Margaret Sanger was a Cult operative who used 'birth control' to sanitise her programme of eugenics. Organisations she founded became what is now Planned Parenthood. Sanger proposed that 'the whole dysgenic population would have its choice of segregation or sterilization'. These included epileptics, 'feeble-minded', and prostitutes. Sanger opposed charity because it perpetuated 'human waste'. She reveals the Cult mentality and if anyone thinks that extermination camps are a 'conspiracy theory' their naivety is touching if breathtakingly stupid. If you don't believe that doctors can act with callous disregard for their patients it is worth considering that doctors and medical staff agreed to put government-decreed DNR orders on medical files and do nothing when resuscitation is called for. I don't know what you call such people in your house. In mine they are Nazis from the Josef Mengele School of Medicine. Phenomenal numbers of old people have died worldwide from the effects of lockdown, depression, lack of treatment, the 'vaccine' (more later) and losing the will to live. A common response at the start of the manufactured pandemic was to remove old people from hospital beds and transfer them to nursing homes. The decision would result in a mass cull of elderly people in those homes through lack of treatment – not 'Covid'. Care home whistleblowers have told how once the 'Covid' era began doctors would not come to their

homes to treat patients and they were begging for drugs like antibiotics that oĜen never came. The most infamous example was ordered by New York governor Andrew Cuomo, brother of a moronic CNN host, who amazingly was given an Emmy Award for his handling of the 'Covid crisis' by the ridiculous Wokers that hand them out. Just how ridiculous could be seen in February, 2021, when a Department of Justice and FBI investigation began into how thousands of old people in New York died in nursing homes aĜer being discharged from hospital to make way for 'Covid' patients on Cuomo's say-so – and how he and his staff covered up these facts. This couldn't have happened to a nicer psychopath. Even then there was a 'Covid' spin. Reports said that thousands of old people who tested positive for 'Covid' in hospital were transferred to nursing homes to both die of 'Covid' and transmit it to others. No – they were in hospital because they were ill and the fact that they tested positive with a test not testing for the 'virus' is irrelevant. They were ill oĜen with respiratory diseases ubiquitous in old people near the end of their lives. Their transfer out of hospital meant that their treatment stopped and many would go on to die. They're old. Who gives a damn? I have exposed in the books for decades the Cult plan to cull the world's old people and even to introduce at some point what they call a 'demise pill' which at a certain age everyone would take and be out of here by law. In March, 2021, Spain legalised euthanasia and assisted suicide following the Netherlands, Belgium, Luxembourg and Canada on the Tiptoe to the demise pill. Treatment of old people by many 'care' homes has been a disgrace in the 'Covid' era. There are many, many, caring staff – I know some. There have, however, been legions of stories about callous treatment of old people and their families. Police were called when families came to take their loved ones home in the light of isolation that was killing them. They became prisoners of the state. Care home residents in insane, fascist Ontario, Canada, were not allowed to leave their room once the 'Covid' hoax began. UK staff have even wheeled elderly people away from windows where family members were talking with them. Oriana Criscuolo from Stockport in the English North West dropped off some things for her 80-year-old father who has Parkinson's disease and dementia and she wanted to wave to him

through a ground-floor window. She was told that was 'illegal'. When she went anyway they closed the curtains in the middle of the day. Oriana It's just unbelievable. I cannot understand how care home staff – people who are being paid to care – have become so uncaring. Their behaviour is inhumane and cruel. It's beyond belief. She was right and this was not a one-off. What a way to end your life in such loveless circumstances. UK registered nurse Nicky Millen, a proper old school nurse for 40 years, said that when she started her career care was based on dignity, choice, compassion and empathy. Now she said 'the things that are important to me have gone out of the window.' She was appalled that people were dying without their loved ones and saying goodbye on iPads. Nicky described how a distressed 89-year-old lady stroked her face and asked her 'how many paracetamol would it take to finish me off'. Life was no longer worth living while not seeing her family. Nicky said she was humiliated in front of the ward staff and patients for letting the lady stroke her face and giving her a cuddle. Such is the dehumanisation that the 'Covid' hoax has brought to the surface. Nicky worked in care homes where patients told her they were being held prisoner. 'I want to live until I die', one said to her. 'I had a lady in tears because she hadn't seen her great-grandson.' Nicky was compassionate old school meeting psychopathic New Normal. She also said she had worked on a 'Covid' ward with no 'Covid' patients. Jewish writer Shai Held wrote an article in March, 2020, which was headlined 'The Staggering, Heartless Cruelty Toward the Elderly'. What he described was happening from the earliest days of lockdown. He said 'the elderly' were considered a group and not unique individuals (the way of the Woke). Shai Held said: Notice how the all-too-familiar rhetoric of dehumanization works: 'The elderly' are bunched together as a faceless mass, all of them considered culprits and thus effectively deserving of the suffering the pandemic will inflict upon them. Lost entirely is the fact that the elderly are individual human beings, each with a distinctive face and voice, each with hopes and dreams, memories and regrets, friendships and marriages, loves lost and loves sustained. 'The elderly' have become another dehumanised group for which anything goes and for many that has resulted in cold disregard for their rights and their life. The distinctive face that Held talks

about is designed to be deleted by masks until everyone is part of a faceless 'War-zone' hospitals myth Again and again medical professionals have told me what was really going on and how hospitals 'overrun like war zones' according to the media were virtually empty. The mantra from medical whistleblowers was please don't use my name or my career is over. Citizen journalists around the world sneaked into hospitals to film evidence exposing the 'war-zone' lie. They really were largely empty with closed wards and operating theatres. I met a hospital worker in my town on the Isle of Wight during the first lockdown in 2020 who said the only island hospital had never been so quiet. Lockdown was justified by the psychopaths to stop hospitals being overrun. At the same time that the island hospital was near-empty the military arrived here to provide extra beds. It was all propaganda to ramp up the fear to ensure compliance with fascism as were never-used temporary hospitals with thousands of beds known as Nightingales and never-used make-shift mortuaries opened by the criminal UK government. A man who helped to install those extra island beds attributed to the army said they were never used and the hospital was empty. Doctors and nurses 'stood around talking or on their were no masks or social distancing. He accused the useless local island paper, the County Press, of 'pumping the fear as if our hospital was overrun and we only have one so it should have been'. He described ambulances parked up with crews outside in deck chairs. When his brother called an ambulance he was told there was a two- hour backlog which he called 'bullshit'. An old lady on the island fell 'and was in a bad way', but a caller who rang for an ambulance was told the situation wasn't urgent enough. Ambulance stations were working under capacity while people would hear ambulances with sirens blaring driving through the streets. When those living near the stations realised what was going on they would follow them as they left, circulated around an urban area with the sirens going, and then came back without stopping. All this was to increase levels of fear and the same goes for the 'ventilator shortage crisis' that cost tens of millions for hastily produced ventilators never to be used. Ambulance crews that agreed to be exploited in this way for fear propaganda might find themselves a mirror. I wish them well with that. Empty hospitals were the obvious

consequence of treatment and diagnoses of non-'Covid' conditions cancelled and those involved handed a death sentence. People have been dying at home from undiagnosed and untreated cancer, heart disease and other life-threatening conditions to allow empty hospitals to deal with a 'pandemic' that wasn't happening. Death of the innocent 'War-zones' have been laying off nursing staff, even doctors where they can. There was no work for them. Lockdown was justified by saving lives and protecting the vulnerable they were actually killing with DNR orders and preventing empty hospitals being 'overrun'. In Britain the mantra of stay at home to 'save the NHS' was everywhere and across the world the same story was being sold when it was all lies. Two California doctors, Dan Erickson and Artin Massihi at Accelerated Urgent Care in Bakersfield, held a news conference in April, 2020, to say that intensive care units in California were 'empty, essentially', with hospitals shutting floors, not treating patients and laying off doctors. The California health system was working at minimum capacity 'getting rid of doctors because we just don't have the volume'. They said that people with conditions such as heart disease and cancer were not coming to hospital out of fear of 'Covid- 19'. Their video was deleted by Susan Wojcicki's Cult-owned YouTube after reaching five million views. Florida governor Ron Desantis, who rejected the severe lockdowns of other states and is governor was given models claiming they would run out of hospital beds in days. That was never going to happen and the 'modellers' knew it. Deceit can be found at every level of the system. Urgent children's operations were cancelled including fracture repairs and biopsies to spot cancer. Eric Nicholls, a consultant paediatrician, said 'this is obviously concerning and we need to return to normal operating and to increase capacity as soon as possible'. Psychopaths in power were rather less concerned because they are psychopaths. Deletion of urgent care and diagnosis has been happening all over the world and how many kids and others have died as a result of the actions of these cold and heartless lunatics dictating 'health' policy? The number must be stratospheric. Richard Sullivan, professor of cancer and global health at King's College London, said people feared 'Covid' more than cancer such was the campaign of fear. 'Years of lost life will be quite dramatic', Sullivan said, with 'a huge amount of avoidable

mortality'. Sarah Woolnough, executive director for policy at Cancer Research UK, said there had been a 75 percent drop in urgent referrals to hospitals by family doctors of people with suspected cancer. Sullivan said that 'a lot of services have had to scale back – we've seen a dramatic decrease in the amount of elective cancer surgery'. Lockdown deaths worldwide has been absolutely fantastic with the New York Post reporting how data confirmed that 'lockdowns end more lives than they save': There was a sharp decline in visits to emergency rooms and an increase in fatal heart attacks because patients didn't receive prompt treatment. Many fewer people were screened for cancer. Social isolation contributed to excess deaths from dementia and Alzheimer's. Researchers predicted that the social and economic upheaval would lead to tens of thousands of "deaths of despair" from drug overdoses, alcoholism and suicide. As unemployment surged and mental-health and substance-abuse treatment programs were interrupted, the reported levels of anxiety, depression and suicidal thoughts increased dramatically, as did alcohol sales and fatal drug overdoses. This has been happening while nurses and other staff had so much time on their hands in the 'war-zones' that Tic-Tok dancing videos began appearing across the Internet with medical staff dancing around in empty wards and corridors as people died at home from causes that would normally have been treated in hospital. Mentions in dispatches One brave and truth-committed whistleblower was Louise Hampton, a call handler with the UK NHS who made a viral Internet video saying she had done 'fuck all' during the 'pandemic' which was 'a load of bollocks'. She said that 'Covid-19' was rebranded flu and of course she lost her job. This is what happens in the medical and endless other professions now when you tell the truth. Louise filmed inside 'war-zone' accident and emergency departments to show they were empty and I mean empty as in no one there. The mainstream media could have done the same and blown the gaff on the whole conspiracy. They haven't to their eternal shame. Not that most 'journalists' seem capable of manifesting shame as with the psychopaths they slavishly repeat without question. The relative few who were admitted with serious health problems were left to die alone with no loved ones allowed to see them because of 'Covid' rules and they included kids dying without

the comfort of mum and dad at their bedside while the evil behind this couldn't give a damn. It was all good fun to them. A Scottish NHS staff nurse publicly quit in the spring of 2021 saying: 'I can no longer be part of the lies and the corruption by the government.' She said hospitals 'aren't full, the beds aren't full, beds have been shut, wards have been shut'. Hospitals were never busy throughout 'Covid'. The staff nurse said that Nicola Sturgeon, tragically the leader of the Scottish government, was on television saying save the hospitals and the NHS – 'but the beds are empty' and 'we've not seen flu, we always see flu every year'. She wrote to government and spoke with her union Unison (the unions are Cult-compromised and useless, but nothing changed. Many of her colleagues were scared of losing their jobs if they spoke out as they wanted to. She said nursing staff were being affected by wearing masks all day and 'my head is splitting every shiŕ from wearing a mask'. The NHS is part of the fascist tyranny and must be dismantled so we can start again with human beings in charge. (Ironically, hospitals were reported to be busier again when official 'Covid' cases fell in spring/summer of 2021 and many other conditions required treatment at the same time as the fake vaccine rollout.) I will cover the 'Covid vaccine' scam in detail later, but it is another indicator of the sickening disregard for human life that I am highlighting here. The DNA-manipulating concoctions do not fulfil the definition of a 'vaccine', have never been used on humans before and were given only emergency approval because trials were not completed and they continued using the unknowing public. The result was what a NHS senior nurse with responsibility for 'vaccine' procedure said was 'genocide'. She said the 'vaccines' were not 'vaccines'. They had not been shown to be safe and claims about their effectiveness by drug companies were 'poetic licence'. She described what was happening as a 'horrid act of human annihilation'. The nurse said that management had instigated a policy of not providing a Patient Information Leaflet (PIL) before people were 'vaccinated' even though health care professionals are supposed to do this according to protocol. Patients should also be told that they are taking part in an ongoing clinical trial. Her challenges to what is happening had seen her excluded from meetings and ridiculed in others. She said she was told to 'watch my step ... or I would find myself surplus to

requirements'. The nurse, who spoke anonymously in fear of her career, said she asked her NHS manager why he/she was content with taking part in genocide against those having the 'vaccines'. The reply was that everyone had to play their part and to 'put up, shut up, and get it done'. Government was 'leaning heavily' on NHS management which was clearly leaning heavily on staff. This is how the global 'medical' hierarchy operates and it starts with the Cult and its World Health She told the story of a doctor who had the Pfizer jab and when questioned had no idea what was in it. The doctor had never read the literature. We have to stop treating doctors as intellectual giants when so many are moral and medical pygmies. The doctor did not even know that the 'vaccines' were not fully approved or that their trials were ongoing. They were, however, asking their patients if they minded taking part in follow-ups for research purposes – yes, the ongoing clinical trial. The nurse said the doctor's ignorance was not rare and she had spoken to a hospital consultant who had the jab without any idea of the background or that the 'trials' had not been completed. Nurses and pharmacists had shown the same ignorance. 'My NHS colleagues have forsaken their duty of care, broken their code of conduct – Hippocratic Oath – and have been brainwashed just the same as the majority of the UK public through propaganda ...' She said she had not been able to recruit a single NHS colleague, doctor, nurse or pharmacist to stand with her and speak out. Her union had refused to help. She said that if the genocide came to light she would not hesitate to give evidence at a Nuremberg-type trial against those in power who could have affected the outcomes but And all for what? To put the nonsense into perspective let's say the 'virus' does exist and let's go completely crazy and accept that the official manipulated figures for cases and deaths are accurate. Even then a study by Stanford University epidemiologist Dr John Ioannidis published on the World Health Organization website produced an average infection to fatality rate of ... 0.23 percent! Ioannidis said: 'If one could sample equally from all locations globally, the median infection fatality rate might even be substantially lower than the 0.23% observed in my analysis.' For healthy people under 70 it was ... 0.05 percent! This compares with the 3.4 percent claimed by the Cult-owned World Health Organization when the hoax was



first played and maximum fear needed to be generated. An updated Stanford study in April, 2021, put the 'infection' to 'fatality' rate at just 0.15 percent. Another team of scientists led by Megan O'Driscoll and Henrik Salje studied data from 45 countries and published their findings on the Nature website. For children and young people the figure is so small it virtually does not register although authorities will be hyping dangers to the young when they introduce DNA-manipulating 'vaccines' for children. The O'Driscoll study produced an average infection-fatality figure of 0.003 for children from birth to four; 0.001 for 5 to 14; 0.003 for 15 to 19; and it was still only 0.456 up to 64. To claim that children must be 'vaccinated' to protect them from 'Covid' is an obvious lie and so there must be another reason and there is. What's more the average age of a 'Covid' death is akin to the average age that people die in general. The average age of death in England is about 80 for men and 83 for women. The average age of death from alleged 'Covid' is between 82 and 83. California doctors, Dan Erickson and Artin Massihi, said at their April media conference that projection models of millions of deaths had been 'woefully inaccurate'. They produced detailed figures showing that Californians had a 0.03 chance of dying from 'Covid' based on the number of people who tested positive (with a test not testing for the 'virus'). Erickson said there was a 0.1 percent chance of dying from 'Covid' in the state of New York, not just the city, and a 0.05 percent chance in Spain, a centre of 'Covid-19' hysteria at one stage. The Stanford studies supported the doctors' data with fatality rate estimates of 0.23 and 0.15 percent. How close are these figures to my estimate of zero? Death-rate figures claimed by the World Health Organization at the start of the hoax were some 15 times higher. The California doctors said there was no justification for lockdowns and the economic devastation they caused. Everything they had ever learned about quarantine was that you quarantine the sick and not the healthy. They had never seen this before and it made no medical sense. Why in the light of all this would governments and medical systems the world over say that billions must go under house arrest; lose their livelihood; in many cases lose their mind, their health and their life; force people to wear masks dangerous to health and psychology; make human interaction and even family

interaction a criminal offence; ban travel; close restaurants, bars, watching live sport, concerts, theatre, and any activity involving human togetherness and discourse; and closing schools to isolate children from their friends and cause many to commit suicide in acts of hopelessness and despair? The California doctors said lockdown consequences included increased child abuse, partner abuse, alcoholism, depression, and other impacts they were seeing every day. Who would do that to the entire human race if not mentally-ill psychopaths of almost unimaginable extremes like Bill Gates? We must face the reality of what we are dealing with and come out of denial. Fascism and tyranny are made possible only by the target population submitting and acquiescing to fascism and tyranny. The whole of human history shows that to be true. Most people naively and unquestioning believed what they were told about a 'deadly virus' and meekly and weakly submitted to house arrest. Those who didn't believe it – at least in total – still submitted in fear of the draconian fines have been imposed, brutal policing by psychopaths for psychopaths, and condemnation from the meek and weak who condemn the Pushbackers on behalf of the very force that has them, too, in its gun sights. 'Pathetic' does not even begin to suffice. Britain's brainless 'Health' Secretary Ma J Hancock warned anyone lying to border officials about returning from a list of 'hotspot' countries could face a jail sentence of up to ten years which is more than for racially-aggravated assault, incest and attempting to have sex with a child under 13. Hancock is a lunatic, but he has the state apparatus behind him in a Cult-led chain reaction and the same with UK 'Vaccine Minister' Nadhim Zahawi, a prominent member of the mega-Cult secret society, Le Cercle, which featured in my earlier books. The Cult enforces its will on governments and medical systems; government and medical systems enforce their will on business and police; business enforces its will on staff who enforce it on customers; police enforce the will of the Cult on the population and play their essential part in creating a world of fascist control that their own children and grandchildren will have to live in their entire lives. It is a hierarchical pyramid of imposition and acquiescence and, yes indeed, of clinical insanity. Does anyone bright enough to read this book have to ask what the answer is? I think not, but I will reveal it anyway in the fewest of

syllables: Tell the psychos and their moronic lackeys to fuck off and let's get on with our lives. We are many – They are few. War on your mind One believes things because one has been conditioned to believe Aldous Huxley, Brave New World have described the 'Covid' hoax as a 'Psyop' and that is true in every sense and on every level in accordance with the definition of that term which is psychological warfare. Break down the 'Covid pandemic' to the foundation themes and it is psychological warfare on the human individual and collective mind. The same can be said for the entire human belief system involving every subject you can imagine. Huxley was right in his contention that people believe what they are conditioned to believe and this comes from the repetition throughout their lives of the same falsehoods. They spew from government, corporations, media and endless streams of 'experts' telling you what the Cult wants you to believe and often believing it themselves (although far from always). 'Experts' are rewarded with 'prestigious' jobs and titles and as agents of perceptual programming with regular access to the media. The Cult has to control the narrative – control information – or they lose control of the vital, crucial, without-which-they-cannot-prevail public perception of reality. The foundation of that control today is the Internet made possible by the Defense Advanced Research Projects Agency (DARPA), the incredibly sinister technological arm of the Pentagon. The Internet is the result of military technology. DARPA openly brags about establishing the Internet which has been a long-term project to lasso the minds of the global population. I have said for decades the plan is to control information to such an extreme that eventually no one would see or hear anything that the Cult does not approve. We are closing in on that end with ferocious censorship since the 'Covid' hoax began and in my case it started back in the 1990s in terms of books and speaking venues. I had to create my own publishing company in 1995 precisely because no one else would publish my books even then. I think they're all still To secure total control of information they needed the Internet in which pre-programmed algorithms can seek out 'unclean' content for deletion and even stop it being posted in the first place. The Cult had to dismantle print and non-Internet broadcast media to ensure the transfer of information to the appropriate-named 'Web' – a critical

expression of the Cult web. We've seen the ever-quicken demise of traditional media and control of what is left by a tiny number of corporations operating worldwide. Independent journalism in the mainstream is already dead and never was that more obvious than since the turn of 2020. The Cult wants all information communicated via the Internet to globally censor and allow the plug to be pulled any time. Lockdowns and forced isolation has meant that communication between people has been through electronic means and no longer through face-to-face discourse and discussion. Cult psychopaths have targeted the bars, restaurants, sport, venues and meeting places in general for this reason. None of this is by chance and it's to stop people gathering in any kind of privacy or number while being able to track and monitor all Internet communications and block them as necessary. Even private messages between individuals have been censored by these fascists that control Cult fronts like Facebook, Twitter, Google and YouTube which are all officially run by Sabbatian place-people and from the background by higher-level Sabbatian place people. Facebook, Google, Amazon and their like were seed-funded and supported into existence with money-no-object infusions of funds either directly or indirectly from DARPA and CIA technology arm In-Q-Tel. The Cult plays the long game and prepares very carefully for big plays like 'Covid'. Amazon is another front in the psychological war and pretty much controls the global market in book sales and increasingly publishing. Amazon's limitless funds have deleted fantastic numbers of independent publishers to seize global domination on the way to deciding which books can be sold and circulated and which cannot. Moves in that direction are already happening. Amazon's leading light Jeff Bezos is the grandson of Lawrence Preston Gise who worked with DARPA predecessor ARPA. Amazon has big connections to the CIA and the Pentagon. The plan I have long described went like this: 1. Employ military technology to establish the Internet. 2. Sell the Internet as a place where people can freely communicate without censorship and allow that to happen until the Net becomes the central and irreversible pillar of human society. If the Internet had been highly censored from the start many would have rejected it. 3. Fund and manipulate major corporations into being to control the circulation of information

on your Internet using cover stories about geeks in garages to explain how they came about. Give them unlimited funds to expand rapidly with no need to make a profit for years while non-Cult companies who need to balance the books cannot compete. You know that in these circumstances your Googles, YouTubes, Facebooks and Amazons are going to secure near monopolies by either crushing or buying up the opposition. 4. Allow freedom of expression on both the Internet and communication platforms to draw people in until the Internet is the central and irreversible pillar of human society and your communication corporations have reached a stage of near monopoly domination. 5. Then unleash your always-planned frenzy of censorship on the basis of 'where else are you going to go?' and continue to expand that until nothing remains that the Cult does not want its human targets to see. The process was timed to hit the 'Covid' hoax to ensure the best chance possible of controlling the narrative which they knew they had to do at all costs. They were, after all, about to unleash a 'deadly virus' that didn't really exist. If you do that in an environment of free-flowing information and opinion you would be dead in the water before you could say Gates is a psychopath. The network was in place through which the Cult-created-and-owned World Health Organization could dictate the 'Covid' narrative and response policy slavishly supported by Cult-owned Internet communication giants and mainstream media while those telling a different story were censored. Google, YouTube, Facebook and Twitter openly announced that they would do this. What else would we expect from Cult-owned operations like Facebook which former executives have confirmed set out to make the platform more addictive than cigarettes and coldly manipulates emotions of its users to sow division between people and groups and scramble the minds of the young? If Zuckerberg lives out the rest of his life without going to jail for crimes against humanity, and most emphatically against the young, it will be a travesty of justice. Still, no matter, cause and effect will catch up with him eventually and the same with Sergey Brin and Larry Page at Google with its CEO Sundar Pichai who fix the Google search results to promote Cult narratives and hide the opposition. Put the same key words into Google and other search engines like DuckDuckGo and you will see how different results can

be. Wikipedia is another intensely biased 'encyclopaedia' which skews its content to the Cult agenda. YouTube links to Wikipedia's version of 'Covid' and 'climate change' on video pages in which experts in their field offer a different opinion (even that is increasingly rare with Wojcicki censorship). Into this 'Covid' silence- them network must be added government media censors, sorry 'regulators', such as Ofcom in the UK which imposed tyrannical restrictions on British broadcasters that had the effect of banning me from ever appearing. Just to debate with me about my evidence and views on 'Covid' would mean breaking the fascistic impositions of Ofcom and its CEO career government bureaucrat Melanie Dawes. Gutless British broadcasters tremble at the very thought of fascist Psychos behind 'Covid' The reason for the 'Covid' catastrophe in all its facets and forms can be seen by whom and what is driving the policies worldwide in such a coordinated way. Decisions are not being made to protect health, but to target psychology. The dominant group guiding and 'advising' government policy are not medical professionals. They are psychologists and behavioural scientists. Every major country has its own version of this phenomenon and I'll use the British example to show how it works. In many ways the British version has been affecting the wider world in the form of the huge behaviour manipulation network in the UK which operates in other countries. The network involves private companies, government, intelligence and military. The Cabinet Office is at the centre of the government 'Covid' Psyop and part-owns, with 'innovation charity' Nesta, the Behavioural Insights Team (BIT) which claims to be independent of government but patently isn't. The BIT was established in 2010 and its job is to manipulate the psyche of the population to acquiesce to government demands and so much more. It is also known as the 'Nudge Unit', a name inspired by the 2009 book by two ultra- Zionists, Cass Sunstein and Richard Thaler, called Nudge: Improving Decisions About Health, Wealth, and Happiness. The book, as with the Behavioural Insights Team, seeks to 'nudge' behaviour (manipulate it) to make the public follow patterns of action and perception that suit those in authority (the Cult). Sunstein is so skilled at this that he advises the World Health Organization and the UK Behavioural Insights Team and was Administrator of the White House Office of Information

and Regulatory Affairs in the Obama administration. Biden appointed him to the Department of Homeland Security – another ultra-Zionist in the fold to oversee new immigration laws which is another policy the Cult wants to control. Sunstein is desperate to silence anyone exposing conspiracies and co-authored a 2008 report on the subject in which suggestions were offered to ban ‘conspiracy theorizing’ or impose ‘some kind of tax, financial or otherwise, on those who disseminate such theories’. I guess a psychiatrist’s chair is out of the question? Sunstein’s mate Richard Thaler, an ‘academic affiliate’ of the UK Behavioural Insights Team, is a proponent of ‘behavioural economics’ which is defined as the study of ‘the effects of psychological, cognitive, emotional, cultural and social factors on the decisions of individuals and institutions’. Study the effects so they can be manipulated to be what you want them to be. Other leading names in the development of behavioural economics are ultra- Zionists Daniel Kahneman and Robert J. Shiller and they, with Thaler, won the Nobel Memorial Prize in Economic Sciences for their work in this field. The Behavioural Insights Team is operating at the heart of the UK government and has expanded globally through partnerships with several universities including Harvard, Oxford, Cambridge, University College London (UCL) and Pennsylvania. They claim to have ‘trained’ (reframed) 20,000 civil servants and run more than 750 projects involving 400 randomised controlled trials in dozens of countries’ as another version of mind reframers Common Purpose. BIT works from its office in New York with cities and their agencies, as well as other partners, across the United States and Canada – this is a company part-owned by the British government Cabinet Office. An executive order by President Cult-servant Obama established a US Social and Behavioral Sciences Team in 2015. They all have the same reason for being and that’s to brainwash the population directly and by brainwashing those in positions of ‘Covid’ mind game Another prime aspect of the UK mind-control network is the ‘independent’ [joke] Scientific Pandemic Insights Group on Behaviours (SPI-B) which ‘provides behavioural science advice aimed at anticipating and helping people adhere to interventions that are recommended by medical or epidemiological experts’. That means manipulating public perception and behaviour to do whatever

government tells them to do. It's disgusting and if they really want the public to be 'safe' this lot should all be under lock and key. According to the government website SPI-B consists of 'behavioural scientists, health and social psychologists, anthropologists and historians' and advises the Whîjy-Vallance-led Scientific Advisory Group for Emergencies (SAGE) which in turn advises the government on 'the science' (it doesn't) and 'Covid' policy. When politicians say they are being guided by 'the science' this is the rabble in each country they are talking about and that 'science' is dominated by behaviour manipulators to enforce government fascism through public compliance. The Behaviour Insight Team is headed by psychologist David Solomon Halpern, a visiting professor at King's College London, and connects with a national and global web of other civilian and military organisations as the Cult moves towards its goal of fusing them into one fascistic whole in every country through its 'Fusion Doctrine'. The behaviour manipulation network involves, but is not confined to, the Foreign Office; National Security Council; government communications headquarters (GCHQ); MI5; MI6; the Cabinet Office-based Media Monitoring Unit; and the Rapid Response Unit which 'monitors digital trends to spot emerging issues; including misinformation and disinformation; and identifies the best way to respond'. There is also the 77th Brigade of the UK military which operates like the notorious Israeli military's Unit 8200 in manipulating information and discussion on the Internet by posing as members of the public to promote the narrative and discredit those who challenge it. Here we have the military seeking to manipulate domestic public opinion while the Nazis in government are fine with that. Conservative Member of Parliament Tobias Ellwood, an advocate of lockdown and control through 'vaccine passports', is a Lieutenant Colonel reservist in the 77th Brigade which connects with the military operation jHub, the 'innovation centre' for the Ministry of Defence and Strategic Command. jHub has also been involved with the civilian National Health Service (NHS) in 'symptom tracing' the population. The NHS is a key part of this mind control network and produced a document in December, 2020, explaining to staff how to use psychological manipulation with different groups and ages to get them to have the DNA-manipulating 'Covid vaccine' that's designed to cumulatively



rewrite human genetics. The document, called 'Optimising Vaccination Roll Out – Do's and Don'ts for all messaging, documents and "communications" in the widest sense', was published by NHS England and the NHS Improvement Behaviour Change Unit in partnership with Public Health England and Warwick Business School. I hear the mantra about 'save the NHS' and 'protect the NHS' when we need to scrap the NHS and start again. The current version is far too corrupt, far too anti-human and totally compromised by Cult operatives and their assets. UK government broadcast media censor Ofcom will connect into this web – as will the BBC with its tremendous Ofcom influence – to control what the public see and hear and dictate mass perception. Nuremberg trials must include personnel from all these The fear factor The 'Covid' hoax has led to the creation of the UK Cabinet Office- connected Joint Biosecurity Centre (JBC) which is officially described as providing 'expert advice on pandemics' using its independent [all Cult operations are 'independent'] analytical function to provide real-time analysis about infection outbreaks to identify and respond to outbreaks of Covid-19'. Another role is to advise the government on a response to spikes in infections – 'for example by closing schools or workplaces in local areas where infection levels have risen'. Put another way, promoting the Cult agenda. The Joint Biosecurity Centre is modelled on the Joint Terrorism Analysis Centre which analyses intelligence to set 'terrorism threat levels' and here again you see the fusion of civilian and military operations and intelligence that has led to military intelligence producing documents about 'vaccine hesitancy' and how it can be combated. Domestic civilian matters and opinions should not be the business of the military. The Joint Biosecurity Centre is headed by Tom Hurd, director general of the Office for Security and Counter-Terrorism from the establishment-to-its-fingertips Hurd family. His father is former Foreign Secretary Douglas Hurd. How coincidental that Tom Hurd went to the elite Eton College and Oxford University with Boris Johnson. Imperial College with its ridiculous computer modeller Neil Ferguson will connect with this gigantic web that will itself interconnect with similar set-ups in other major and not so major countries. Compared with this Cult network the politicians, be they Boris Johnson, Donald Trump or Joe Biden, are

bit-part players 'following the science'. The network of psychologists was on the 'Covid' case from the start with the aim of generating maximum fear of the 'virus' to ensure compliance by the population. A government behavioural science group known as SPI-B produced a paper in March, 2020, for discussion by the main government science advisory group known as SAGE. It was headed 'Options for increasing adherence to social distancing measures' and it said the following in a section headed 'Persuasion': A substantial number of people still do not feel sufficiently personally threatened; it could be that they are reassured by the low death rate in their demographic group, although levels of concern may be rising. Having a good understanding of the risk has been found to be positively associated with adoption of COVID-19 social distancing measures in Hong Kong. The perceived level of personal threat needs to be increased among those who are complacent, using hard-hitting evaluation of options for increasing social distancing emotional messaging. To be effective this must also empower people by making clear the actions they can take to reduce the threat. Responsibility to others: There seems to be insufficient understanding of, or feelings of responsibility about, people's role in transmitting the infection to others ... Messaging about actions need to be framed positively in terms of protecting oneself and the community, and increase confidence that they will be effective. Some people will be more persuaded by appeals to play by the rules, some by duty to the community, and some to personal risk. All these different approaches are needed. The messaging also needs to take account of the realities of different people's lives. Messaging needs to take account of the different motivational levers and circumstances of different people. All this could be achieved the SPI-B psychologists said by using the media to increase the sense of personal threat which translates as terrify the shit out of the population, including children, so they all do what we want. That's not happened has it? Those excuses for 'journalists' who wouldn't know journalism if it bit them on the arse (the great majority) have played their crucial part in serving this Cult- government Psyop to enslave their own kids and grandkids. How they live with themselves I have no idea. The psychological war has been underpinned by constant government 'Covid' propaganda in

almost every television and radio ad break, plus the Internet and print media, which has pounded out the fear with taxpayers footing the bill for their own programming. The result has been people terrified of a 'virus' that doesn't exist or one with a tiny fatality rate even if you believe it does. People walk down the street and around the shops wearing face-nappies damaging their health and psychology while others report those who refuse to be that naïve to the police who turn up in their own face-nappies. I had a cameraman come to my flat and he was so frightened of 'Covid' he came in wearing a mask and refused to shake my hand in case he caught something. He had – naïveitis – and the thought that he worked in the mainstream media was both depressing and made his behaviour perfectly explainable. The fear which has gripped the minds of so many and frozen them into compliance has been carefully cultivated by these psychologists who are really psychopaths. If lives get destroyed and a lot of young people commit suicide it shows our plan is working. SPI-B then turned to compulsion on the public to comply. 'With adequate preparation, rapid change can be achieved', it said. Some countries had introduced mandatory self-isolation on a wide scale without evidence of major public unrest and a large majority of the UK's population appeared to be supportive of more coercive measures with 64 percent of adults saying they would support putting London under a lockdown (watch the 'polls' which are designed to make people believe that public opinion is in favour or against whatever the subject in hand). For 'aggressive protective measures' to be effective, the SPI-B paper said, special attention should be devoted to those population groups that are more at risk. Translated from the Orwellian this means making the rest of population feel guilty for not protecting the 'vulnerable' such as old people which the Cult and its agencies were about to kill on an industrial scale with lockdown, lack of treatment and the Gates 'vaccine'. Psychopath psychologists sold their guilt-trip so comprehensively that Los Angeles County Supervisor Hilda Solis reported that children were apologising (from a distance) to their parents and grandparents for bringing 'Covid' into their homes and getting them sick. '... These apologies are just some of the last words that loved ones will ever hear as they die alone,' she said. Gut-wrenchingly Solis then

used this childhood tragedy to tell children to stay at home and 'keep your loved ones alive'. Imagine heaping such potentially life-long guilt on a kid when it has absolutely nothing to do with them. These people are deeply disturbed and the psychologists behind this even more so. Uncivil war – divide and rule Professional mind-controllers at SPI-B wanted the media to increase a sense of responsibility to others (do as you're told) and promote 'positive messaging' for those actions while in contrast to invoke 'social disapproval' by the unquestioning, obedient, community of anyone with a mind of their own. Again the compliant Goebbels-like media obliged. This is an old, old, trick employed by tyrannies the world over throughout human history. You get the target population to keep the target population in line – your line. SPI-B said this could 'play an important role in preventing anti-social behaviour or discouraging failure to enact pro-social behaviour'. For 'anti-social' in the Orwellian parlance of SPI-B see any behaviour that government doesn't approve. SPI-B recommendations said that 'social disapproval' should be accompanied by clear messaging and promotion of strong collective identity – hence the government and celebrity mantra of 'we're all in this together'. Sure we are. The mind doctors have such contempt for their targets that they think some clueless comedian, actor or singer telling them to do what the government wants will be enough to win them over. We have had UK comedian Lenny Henry, actor Michael Caine and singer Elton John wheeled out to serve the propagandists by urging people to have the DNA-manipulating 'Covid' non-'vaccine'. The role of Henry and fellow black celebrities in seeking to coax a 'vaccine' especially stomach-turning. An emotion-manipulating script and carefully edited video featuring these black 'celebs' was such an insult to the intelligence of black people and where's the self-respect of those involved selling their souls to a fascist government agenda? Henry said he heard black people's 'legitimate worries and exactly that by not having the 'vaccine'. They had to include the obligatory reference to Black Lives Matter with the line ... 'Don't let coronavirus cost even more black lives – because we matter'. My god, it was pathetic. 'I know the vaccine is safe and what it does.' How? 'I'm a comedian and it says so in my script.' SPI-B said social disapproval needed to be carefully managed to avoid

victimisation, scapegoating and misdirected criticism, but they knew that their 'recommendations' would lead to exactly that and the media were specifically used to stir-up the divide-and-conquer hostility. Those who conform like good lijlle baa, baas, are praised while those who have seen through the tidal wave of lies are 'Covidiot's'. The awake have been abused by the fast asleep for not conforming to fascism and impositions that the awake know are designed to endanger their health, dehumanise them, and tear asunder the very fabric of human society. We have had the curtain- twitchers and morons reporting neighbours and others to the face- napped police for breaking 'Covid rules' with fascist police delighting in posting links and phone numbers where this could be done. The Cult cannot impose its will without a compliant police and military or a compliant population willing to play their part in enslaving themselves and their kids. The words of a pastor in Nazi Germany are so appropriate today: First they came for the socialists and I did not speak out because I was not a socialist. Then they came for the trade unionists and I did not speak out because I was not a trade Then they came for the Jews and I did not speak out because I was not a Jew. Then they came for me and there was no one left to speak for me. Those who don't learn from history are destined to repeat it and so 'Covid' rules: Rewiring the mind With the background laid out to this gigantic national and global web of psychological manipulation we can put 'Covid' rules into a clear and sinister perspective. Forget the claims about protecting health. 'Covid' rules are about dismantling the human mind, breaking the human spirit, destroying self-respect, and then puŕjing Humpty Dumpty together again as a servile, submissive slave. Social isolation through lockdown and distancing have devastating effects on the human psyche as the psychological psychopaths well know and that's the real reason for them. Humans need contact with each other, discourse, closeness and touch, or they eventually, and literarily, go crazy. Masks, which I will address at some length, fundamentally add to the effects of isolation and the Cult agenda to dehumanise and de-individualise the population. To do this while knowing – in fact seeking – this outcome is the very epitome of evil and psychologists involved in this are the epitome of evil. They must like all the rest of the Cult demons and their assets

stand trial for crimes against humanity on a scale that defies the imagination. Psychopaths in uniform use isolation to break enemy troops and agents and make them subservient and submissive to tell what they know. The technique is rightly considered a form of torture and torture is most certainly what has been imposed on the human. Clinically-insane American psychologist Harry Harlow became famous for his isolation experiments in the 1950s in which he separated baby monkeys from their mothers and imprisoned them for months on end in a metal container or 'pit of despair'. They soon began to show mental distress and depression as any idiot could have predicted. Harlow put other monkeys in steel chambers for three, six or twelve months while denying them any contact with animals or humans. He said that the effects of total social isolation for six months were 'so devastating and debilitating that we had assumed initially that twelve months of isolation would not produce any additional decrement'; but twelve months of isolation 'almost obliterated the animals socially'. This is what the Cult and its partial isolation in which they were not allowed to form relationships with other monkeys became 'aggressive and hostile, not only to others, but also towards their own bodies'. We have seen this in the young as a consequence of lockdown. UK government psychopaths launched a public relations campaign telling people not to hug each other even after they received the 'Covid-19 vaccine' which we were told with more lies would allow a return to 'normal life'. A government source told The Telegraph: 'It will be along the lines that it is great that you have been vaccinated, but if you are going to visit your family and hug your grandchildren there is a chance you are going to infect people you love.' The source was apparently speaking from a secure psychiatric facility. Janet Lord, director of Birmingham University's Institute of Inflammation and Ageing, said that parents and grandparents should avoid hugging their children. Well, how can I put it, Ms Lord? Fuck off. Yep, that'll Destroying the kids – where are the parents? Observe what has happened to people enslaved and isolated by lockdown as suicide and self-harm has soared worldwide, particularly among the young denied the freedom to associate with their friends. A study of 49,000 people in English-speaking countries concluded that almost half of young adults are at clinical risk of

mental health disorders. A national survey in America of 1,000 currently enrolled high school and college students found that 5 percent reported attempting suicide during the pandemic. Data from the US CDC's National Syndromic Surveillance Program from January 1st to October 17th, 2020, revealed a 31 percent increase in mental health issues among adolescents aged 12 to 17 compared with 2019. The CDC reported that America in general suffered the biggest drop in life expectancy since World War Two as it fell by a year in the first half of 2020 as a result of 'deaths of despair' – overdoses and suicides. Deaths of despair have leapt by more than 20 percent during lockdown and include the highest number of fatal overdoses ever recorded in a single year – 81,000. Internet addiction is another consequence of being isolated at home which lowers interest in physical activities as kids fall into inertia and what's the point? Children and young people are losing hope and giving up on life, sometimes literally. A 14-year-old boy killed himself in Maryland because he had 'given up' when his school district didn't reopen; an 11-year-old boy shot himself during a zoom class; a teenager in Maine succumbed to the isolation of the 'pandemic' when he ended his life after experiencing a disrupted senior year at school. Children as young as nine have taken their life and all these stories can be repeated around the world. Careers are being destroyed before they start and that includes those in sport in which promising youngsters have not been able to take part. The plan of the psycho-psychologists is working all right. Researchers at Cambridge University found that lockdowns cause significant harm to children's mental health. Their study was published in the Archives of Disease in Childhood, and followed 168 children aged between 7 and 11. The researchers concluded: During the UK lockdown, children's depression symptoms have increased substantially, relative to before lockdown. The scale of this effect has direct relevance for the continuation of different elements of lockdown policy, such as complete or partial school closures ... ... Specifically, we observed a statistically significant increase in ratings of depression, with a medium-to-large effect size. Our findings emphasise the need to incorporate the potential impact of lockdown on child mental health in planning the ongoing response to the global pandemic and the recovery from it. Not a chance when the Cult's

psycho-psychologists were getting exactly what they wanted. The UK's Royal College of Paediatrics and Child Health has urged parents to look for signs of eating disorders in children and young people after a three to four fold increase. Specialists say the 'pandemic' is a major reason behind the rise. You don't say. The College said isolation from friends during school closures, exam cancellations, loss of extra-curricular activities like sport, and an increased use of social media were all contributory factors along with fears about the virus (psycho-psychologists again), family finances, and students being forced to quarantine. Doctors said young people were becoming severely ill by the time they were seen with 'Covid' regulations reducing face-to-face consultations. Nor is it only the young that have been devastated by the psychopaths. Like all bullies and cowards the Cult is targeting the young, elderly, weak and infirm. A typical story was told by a British lady called Lynn Parker who was not allowed to visit her husband in 2020 for the last ten and half months of his life 'when he needed me most' between March 20th and when he died on December 19th. This vacates the criminal and enters the territory of evil. The emotional impact on the immune system alone is immense as are the number of people of all ages worldwide who have died as a result of Cult-demanded, Gates-demanded, lockdowns. Isolation is torture The experience of imposing solitary confinement on millions of prisoners around the world has shown how a large percentage become 'actively psychotic and/or acutely suicidal'. Social isolation has been found to trigger 'a specific psychiatric syndrome, characterized by hallucinations; panic attacks; overt paranoia; diminished impulse control; hypersensitivity to external stimuli; and difficulties with thinking, concentration and memory'. Juan Mendez, a United Nations rapporteur (investigator), said that isolation is a form of torture. Research has shown that even after isolation prisoners find it far more difficult to make social connections and I remember chatting to a shop assistant after one lockdown who told me that when her young son met another child again he had no idea how to act or what to do. Hannah Flanagan, Director of Emergency Services at Journey Mental Health Center in Dane County, Wisconsin, said: 'The specificity about Covid social distancing and isolation that we've come across as contributing factors to



the suicides are really new to us this year.' But they are not new to those that devised them. They are getting the effect they want as the population is psychologically dismantled to be rebuilt in a totally different way. Children and the young are particularly targeted. They will be the adults when the full-on fascist AI-controlled technocracy is planned to be imposed and they are being prepared to meekly submit. At the same time older people who still have a memory of what life was like before – and how fascist the new normal really is – are being deleted. You are going to see efforts to turn the young against the old to support this geriatric genocide. Hannah Flanagan said the big increase in suicide in her county proved that social isolation is not only harmful, but deadly. Studies have shown that isolation from others is one of the main risk factors in suicide and even more so with women. Warnings that lockdown could create a 'perfect storm' for suicide were ignored. After all this was one of the reasons for lockdown. Suicide, however, is only the most extreme of isolation consequences. There are many others. Dr Dhruv Khullar, assistant professor of healthcare policy at Weill Cornell Medical College, said in a New York Times article in 2016 long before the fake 'pandemic': A wave of new research suggests social separation is bad for us. Individuals with less social connection have disrupted sleep patterns, altered immune systems, more inflammation and higher levels of stress hormones. One recent study found that isolation increases the risk of heart disease by 29 percent and stroke by 32 percent. Another analysis that pooled data from 70 studies and 3.4 million people found that socially isolated individuals had a 30 percent higher risk of dying in the next seven years, and that this effect was largest in middle age. Loneliness can accelerate cognitive decline in older adults, and isolated individuals are twice as likely to die prematurely as those with more robust social interactions. These effects start early: Socially isolated children have significantly poorer health 20 years later, even after controlling for other factors. All told, loneliness is as important a risk factor for early death as obesity and smoking. There you have proof from that one article alone four years before 2020 that those who have enforced lockdown, social distancing and isolation knew what the effect would be and that is even more so with professional psychologists that have been driving the

policy across the globe. We can go back even further to the years 2000 and 2003 and the start of a major study on the effects of isolation on health by Dr Janine Gronewold and Professor Dirk M. Hermann at the University Hospital in Essen, Germany, who analysed data on 4,316 people with an average age of 59 who were recruited for the long-term research project. They found that socially isolated people are more than 40 percent more likely to have a heart attack, stroke, or other major cardiovascular event and nearly 50 percent more likely to die from any cause. Given the financial Armageddon unleashed by lockdown we should note that the study found a relationship between increased cardiovascular risk and lack of financial support. After excluding other factors social isolation was still connected to a 44 percent increased risk of cardiovascular problems and a 47 percent increased risk of death by any cause. Lack of financial support was associated with a 30 percent increase in the risk of cardiovascular health events. Dr Gronewold said it had been known for some time that feeling lonely or lacking contact with close friends and family can have an impact on physical health and the study had shown that having strong social relationships is of high importance for heart health. Gronewold said they didn't understand yet why people who are socially isolated have such poor health outcomes, but this was obviously a worrying finding, particularly during these times of prolonged social distancing. Well, it can be explained on many levels. You only have to identify the point in the body where people feel loneliness and missing people they are parted from – it's in the centre of the chest where they feel the ache of loneliness and the ache of missing people. 'My heart aches for you' ... 'My heart aches for some company.' I will explain this more in the chapter Escaping Wetiko, but when you realise that the body is the mind – they are expressions of each other – the reason why state of the mind dictates state of the body becomes clear. American psychologist Ranjit Powar was highlighting the effects of lockdown isolation as early as April, 2020. She said humans have evolved to be social creatures and are wired to live in interactive groups. Being isolated from family, friends and colleagues could be unbalancing and traumatic for most people and could result in short or even long-term psychological and physical health problems. An increase in levels of anxiety,

aggression, depression, forgetfulness and hallucinations were possible psychological effects of isolation. 'Mental conditions may be precipitated for those with underlying pre-existing susceptibilities and show up in many others without any pre-condition.' Powar said personal relationships helped us cope with stress and if we lost this outlet for letting off steam the result can be a big emotional void which, for an average person, was difficult to deal with. 'Just a few days of isolation can cause increased levels of anxiety and depression' – so what the hell has been the effect on the global population of 18 months of this at the time of writing? Powar said: 'Add to it the looming threat of a dreadful disease being repeatedly hammered in through the media and you have a recipe for many shades of mental and physical distress.' For those with a house and a garden it is easy to forget that billions have had to endure lockdown isolation in tiny overcrowded flats and apartments with nowhere to go outside. The psychological and physical consequences of this are unimaginable and with lunatic and abusive partners and parents the consequences have led to tremendous increases in domestic and child abuse and alcoholism as people seek to shut out the horror. Ranjit Powar said: Staying in a confined space with family is not all a rosy picture for everyone. It can be extremely oppressive and claustrophobic for large low-income families huddled together in small single-room houses. Children here are not lucky enough to have many board/electronic games or books to keep them occupied. Add to it the deep insecurity of running out of funds for food and basic necessities. On the other hand, there are people with dysfunctional family dynamics, such as domineering, abusive or alcoholic partners, siblings or parents which makes staying home a period of trial. Incidence of suicide and physical abuse against women has shown a worldwide increase. Heightened anxiety and depression also affect a person's immune system, making them more susceptible to illness. To think that Powar's article was published on April 11th, 2020. Social (unsocial) distancing demanded that people stay six feet or two metres apart. UK government advisor Robert Dingwall from the New and Emerging Respiratory Virus Threats Advisory Group said in a radio interview that the two-metre rule was 'conjured up out of nowhere' and was not based on science. No, it was not based on medical

science, but it didn't come out of nowhere. The distance related to psychological science. Six feet/two metres was adopted in many countries and we were told by people like the criminal Anthony Fauci and his ilk that it was founded on science. Many schools could not reopen because they did not have the space for six- foot distancing. Then in March, 2021, after a year of six-feet 'science', a study published in the Journal of Infectious Diseases involving more than 500,000 students and almost 100,000 staff over 16 weeks revealed no significant difference in 'Covid' cases between six feet and three feet and Fauci changed his tune. Now three feet was okay. There is no difference between six feet and three inches when there is no 'virus' and they got away with six feet for psychological reasons for as long as they could. I hear journalists and others talk about 'unintended consequences' of lockdown. They are not unintended at all; they have been coldly-calculated for a specific outcome of human control and that's why super-psychopaths like Gates have called for them so vehemently. Super-psychopath psychologists have demanded them and psychopathic or clueless, spineless, politicians have gone along with them by 'following the science'. But it's not science at all. 'Science' is not what is; it's only what people can be manipulated to believe it is. The whole 'Covid' catastrophe is founded on mind control. Three word or three statement mantras issued by the UK government are a well-known mind control technique and so we've had 'Stay home/protect the NHS/save lives', 'Stay alert/control the virus/save lives' and 'hands/face/space'. One of the most vocal proponents of extreme 'Covid' rules in the UK has been Professor Susan Michie, a member of the British Communist Party, who is not a medical professional. Michie is the director of the Centre for Behaviour Change at University College London. She is a behavioural psychologist and another filthy rich 'Marxist' who praised China's draconian lockdown. She was known by fellow students at Oxford University as 'Stalin's nanny' for her extreme Marxism. Michie is an influential member of the UK government's Scientific Advisory Group for Emergencies (SAGE) and behavioural manipulation groups which have dominated 'Covid' policy. She is a consultant adviser to the World Health Organization on 'Covid-19' and behaviour. Why the hell are lockdowns anything to do with her when they are claimed to be

about health? Why does a behavioural psychologist from a group charged with changing the behaviour of the public want lockdown, human isolation and mandatory masks? Does that question really need an answer? Michie absolutely has to explain herself before a Nuremberg court when humanity takes back its world again and even more so when you see the consequences of masks that she demands are compulsory. This is a Michie classic: The benefits of getting primary school children to wear masks is that regardless of what little degree of transmission is occurring in those age groups it could help normalise the practice. Young children wearing masks may be more likely to get their families to accept masks. Those words alone should carry a prison sentence when you ponder on the callous disregard for children involved and what a statement it makes about the mind and motivations of Susan Michie. What a lovely lady and what she said there encapsulates the mentality of the psychopaths behind the 'Covid' horror. Let us compare what Michie said with a countrywide study in Germany published at [researchsquare.com](https://www.researchsquare.com) involving 25,000 school children and 17,854 health complaints submitted by parents. Researchers found that masks are harming children physically, psychologically, and behaviourally with 24 health issues associated with mask wearing. They include: shortness of breath (29.7%); dizziness (26.4%); increased headaches (53%); difficulty concentrating (50%); drowsiness or fatigue (37%); and malaise (42%). Nearly a third of children experienced more sleep issues than before and a quarter developed new fears. Researchers found health issues and other impairments in 68 percent of masked children covering their faces for an average of 4.5 hours a day. Hundreds of those taking part experienced accelerated respiration, tightness in the chest, weakness, and short-term impairment of consciousness. A reminder of what Michie said again: The benefits of getting primary school children to wear masks is that regardless of what little degree of transmission is occurring in those age groups it could help normalise the practice. Young children wearing masks may be more likely to get their families to accept masks. Psychopaths in government and psychology now have children and young people – plus all the adults – wearing masks for hours on end while clueless teachers impose the will of the psychopaths on

the Cult lab rats We have some schools already imposing on students microchipped buzzers that activate when they get 'too close' to their pals in the way they do with lab rats. How apt. To the Cult and its brain-dead servants our children are lab rats being conditioned to be unquestioning, dehumanised slaves for the rest of their lives. Children and young people are being weaned and frightened away from the most natural human instincts including closeness and touch. I have tracked in the books over the years how schools were banning pupils from greeting each other with a hug and the whole Cult-induced Me Too movement has terrified men and boys from a relaxed and natural interaction with female friends and work colleagues to the point where many men try never to be in a room alone with a woman that's not their partner. Airhead celebrities have as always played their virtue-signalling part in making this happen with their gross exaggeration. For every monster like Harvey Weinstein there are at least tens of thousands of men that don't treat women like that; but everyone must be branded the same and policy changed for them as well as the monster. I am going to be using the word 'dehumanise' many times in this chapter because that is what the Cult is seeking to do and it goes very deep as we shall see. Don't let them kid you that social distancing is planned to end one day. That's not the idea. We are seeing more governments and companies funding and producing wearable gadgets to keep people apart and tech start-up company backed by GCHQ, the British Intelligence and military surveillance headquarters, has created a social distancing wrist sensor that alerts people when they get too close to others. The CIA has also supported tech companies developing similar devices. The wearable sensor was developed by Tended, one of a number of start-up companies supported by GCHQ (see the CIA and DARPA). The device can be worn on the wrist or as a tag on the waistband and will vibrate whenever someone wearing the device breaches social distancing and gets anywhere near natural human contact. The company had a lucky break in that it was developing a distancing sensor when the 'Covid' hoax arrived which immediately provided a potentially enormous market. How fortunate. The government in big-time Cult-controlled Ontario in Canada is investing \$2.5 million in wearable contact tracing

technology that 'will alert users if they may have been exposed to the Covid-19 in the workplace and will beep or vibrate if they are within six feet of another person'. Facedrive Inc., the technology company behind this, was founded in 2016 with funding from the Ontario Together Fund and obviously they, too, had a prophet on the board of directors. The human surveillance and control technology is called TraceSCAN and would be worn by the human cyborgs in places such as airports, workplaces, construction sites, care homes and ... schools. I emphasise schools with children and young people the prime targets. You know what is planned for society as a whole if you keep your eyes on the schools. They have always been places where the state program the next generation of slaves to be its compliant worker-ants – or Woker-ants these days; but in the mist of the 'Covid' madness they have been transformed into mind laboratories on a scale never seen before. Teachers and head teachers are just as programmed as the kids – oĜen more so. Children are kept apart from human interaction by walk lanes, classroom distancing, staggered meal times, masks, and the rolling-out of buzzer systems. Schools are now physically laid out as a laboratory maze for lab-rats. Lunatics at a school in Anchorage, Alaska, who should be prosecuted for child abuse, took away desks and forced children to kneel (know your place) on a mat for five hours a day while wearing a mask and using their chairs as a desk. How this was supposed to impact on a 'virus' only these clinically insane people can tell you and even then it would be clap-trap. The school banned recess (interaction), art classes (creativity), and physical exercise (geĴing body and mind moving out of inertia). Everyone behind this outrage should be in jail or beĴer still a mental institution. The behavioural manipulators are all for this dystopian approach to schools. Professor Susan Michie, the mind-doctor and British Communist Party member, said it was wrong to say that schools were safe. They had to be made so by 'distancing', masks and ventilation (siĴing all day in the cold). I must ask this lady round for dinner on a night I know I am going to be out and not back for weeks. She probably wouldn't be able to make it, anyway, with all the visits to her own psychologist she must have block-booked. I know how shocking it must be for you that a behaviour manipulator like Michie wants everyone to wear masks

which have long been a feature of mind-control programs like the infamous MKUltra in the United States, but, there we are. We live and learn. I spent many years from 1996 to right across the millennium researching mind control in detail on both sides of the Atlantic and elsewhere. I met a large number of mind-control survivors and many had been held captive in body and mind by MKUltra. MK stands for mind-control, but employs the German spelling in deference to the Nazis spirited out of Germany at the end of World War Two by Operation Paperclip in which the US authorities, with help from the Vatican, transported Nazi mind-controllers and engineers to America to continue their work. Many of them were behind the creation of NASA and they included Nazi scientist and SS officer Wernher von Braun who swapped designing V-2 rockets to bombard London with designing the Saturn V rockets that powered the NASA moon programme's Apollo craft. I think I may have mentioned that the Cult has no borders. Among Paperclip escapees was Josef Mengele, the Angel of Death in the Nazi concentration camps where he conducted mind and genetic experiments on children often using twins to provide a control twin to measure the impact of his 'work' on the other. If you want to observe the Cult mentality in all its extremes of evil then look into the life of Mengele. I have met many people who suffered mercilessly under Mengele in the United States where he operated under the name Dr Greene and became a stalwart of MKUltra programming and torture. Among his locations was the underground facility in the Mojave Desert in California called the China Lake Naval Weapons Station which is almost entirely below the surface. My books *The Biggest Secret*, *Children of the Matrix* and *The Perception Deception* have the detailed background to MKUltra. The best-known MKUltra survivor is American Cathy O'Brien. I first met her and her late partner Mark Phillips at a conference in Colorado in 1996. Mark helped her escape and deprogram from decades of captivity in an offshoot of MKUltra known as Project Monarch in which 'sex slaves' were provided for the rich and famous including Father George Bush, Dick Cheney and the Clintons. Read Cathy and Mark's book *Trance-Formation of America* and if you are new to this you will be shocked to the core. I read it in 1996 shortly before, with the usual synchronicity of my life, I found myself



given a book table at the conference right next to hers. MKUltra never ended despite being very publicly exposed (only a small part of it) in the 1970s and continues in other guises. I am still in touch with Cathy. She contacted me during 2020 after masks became compulsory in many countries to tell me how they were used as part of MKUltra programming. I had been observing 'Covid regulations' and the relationship between authority and public for months. I saw techniques that I knew were employed on individuals in MKUltra being used on the global population. I had read many books and manuals on mind control including one called Silent Weapons for Quiet Wars which came to light in the 1980s and was a guide on how to perceptually program on a mass scale. 'Silent Weapons' refers to mind-control. I remembered a line from the manual as governments, medical authorities and law enforcement agencies have so obviously talked to – or rather at – the adult population since the 'Covid' hoax began as if they are children. The If a person is spoken to by a T.V. advertiser as if he were a twelve-year-old, then, due to suggestibility, he will, with a certain probability, respond or react to that suggestion with the uncritical response of a twelve-year-old and will reach in to his economic reservoir and deliver its energy to buy that product on impulse when he passes it in the store. That's why authority has spoken to adults like children since all this Why did Michael Jackson wear masks? Every aspect of the 'Covid' narrative has mind-control as its central theme. Cathy O'Brien wrote an article for davidicke.com about the connection between masks and mind control. Her daughter Kelly who I first met in the 1990s was born while Cathy was still held captive in MKUltra. Kelly was forced to wear a mask as part of her programming from the age of two to dehumanise her, target her sense of individuality and reduce the amount of oxygen her brain and body received. Bingo. This is the real reason for compulsory masks, why they have been enforced en masse, and why they seek to increase the number they demand you wear. First one, then two, with one disgraceful alleged 'doctor' recommending four which is nothing less than a death sentence. Where and how often they must be worn is being expanded for the purpose of mass mind control and damaging respiratory health which they can call 'Covid-19'. Canada's government headed by the man-child Justin Trudeau, says it's fine

for children of two and older to wear masks. An insane 'study' in Italy involving just 47 children concluded there was no problem for babies as young as four months wearing them. Even after people were 'vaccinated' they were still told to wear masks by the criminal that is Anthony Fauci. Cathy wrote that mandating masks is allowing the authorities literally to control the air we breathe which is what was done in MKUltra. You might recall how the singer Michael Jackson wore masks and there is a reason for that. He was subjected to MKUltra mind control through Project Monarch and his psyche was scrambled by these simpletons. Cathy wrote: In MKUltra Project Monarch mind control, Michael Jackson had to wear a mask to silence his voice so he could not reach out for help. Remember how he developed that whisper voice when he wasn't singing? Masks control the mind from the outside in, like the redefining of beaten, for example, it ultimately controls thought that drives our words and ultimately actions (or lack thereof). Likewise, a mask muffles our speech so that we are not heard, which controls voice ... words ... mind. This is Mind Control. Masks are an obvious mind control device, and I am disturbed so many people are complying on a global scale. Masks depersonalize while making a person feel as though they have no voice. It is a barrier to others. People who would never choose to comply but are forced to wear a mask in order to keep their job, and ultimately their family fed, are compromised. They often feel shame and are subdued. People have stopped talking with each other while media controls the narrative. The 'no voice' theme has often become literal with train passengers told not to speak to each other in case they pass on the 'virus', singing banned for the same reason and bonkers California officials telling people riding roller coasters that they cannot shout and scream. Cathy said she heard every day from healed MKUltra survivors who cannot wear a mask without flashing back on ways their breathing was controlled – 'from ball gags and penises to water boarding'. She said that through the years when she saw images of people in China wearing masks 'due to pollution' that it was really to control their oxygen levels. 'I knew it was as much of a population control mechanism of depersonalisation as are burkas', she said. Masks are another Chinese communist/fascist method of control that has been swept across

the West as the West becomes China at lightning speed since we entered 2020. There are other reasons for mandatory masks and these include destroying respiratory health to call it 'Covid-19' and stunting brain development of children and the young. Dr Margarite Griesz-Brisson MD, PhD, is a Consultant Neurologist and Neurophysiologist and the Founder and Medical Director of the London Neurology and Pain Clinic. Her CV goes down the street and round the corner. She is clearly someone who cares about people and won't parrot the propaganda. Griesz-Brisson has a PhD in pharmacology, with special interest in neurotoxicology, environmental medicine, neuroregeneration and neuroplasticity (the way the brain can change in the light of information received). She went public in October, 2020, with a passionate warning about the effects of mask-wearing laws: The reinhalation of our exhaled air will without a doubt create oxygen deficiency and a flooding of carbon dioxide. We know that the human brain is very sensitive to oxygen deprivation. There are nerve cells for example in the hippocampus that can't be longer than 3 minutes without oxygen – they cannot survive. The acute warning symptoms are headaches, drowsiness, dizziness, issues in concentration, slowing down of reaction time – reactions of the cognitive system. Oh, I know, let's tell bus, truck and taxi drivers to wear them and people working machinery. How about pilots, doctors and police? Griesz-Brisson makes the important point that while the symptoms she mentions may fade as the body readjusts this does not alter the fact that people continue to operate in oxygen deficit with long list of potential consequences. She said it was well known that neurodegenerative diseases take years or decades to develop. 'If today you forget your phone number, the breakdown in your brain would have already started 20 or 30 years ago.' She said degenerative processes in your brain are getting amplified as your oxygen deprivation continues through wearing a mask. Nerve cells in the brain are unable to divide themselves normally in these circumstances and lost nerve cells will no longer be regenerated. 'What is gone is gone.' Now consider that people like shop workers and schoolchildren are wearing masks for hours every day. What in the name of sanity is going to be happening to them? 'I do not wear a mask, I need my brain to think', Griesz-Brisson said, 'I want to have a clear head

when I deal with my patients and not be in a carbon dioxide-induced anaesthesia'. If you are told to wear a mask anywhere ask the organisation, police, store, whatever, for their risk assessment on the dangers and negative effects on mind and body of enforcing mask-wearing. They won't have one because it has never been done not even by government. All of them must be subject to class-action lawsuits as the consequences come to light. They don't do mask risk assessments for an obvious reason. They know what the conclusions would be and independent scientific studies that have been done tell a horror story of consequences. 'Masks are criminal' Dr Griesz-Brisson said that for children and adolescents, masks are an absolute no-no. They had an extremely active and adaptive immune system and their brain was incredibly active with so much to learn. 'The child's brain, or the youth's brain, is thirsting for oxygen.' The more metabolically active an organ was, the more oxygen it required; and in children and adolescents every organ was metabolically active. Griesz-Brisson said that to deprive a child's or adolescent's brain of oxygen, or to restrict it in any way, was not only dangerous to their health, it was absolutely criminal. 'Oxygen deficiency inhibits the development of the brain, and the damage that has taken place as a result CANNOT be reversed.' Mind manipulators of MKUltra put masks on two-year-olds they wanted to neurologically rewire and you can see why. Griesz-Brisson said a child needs the brain to learn and the brain needs oxygen to function. 'We don't need a clinical study for that. This is simple, indisputable physiology.' Consciously and purposely induced oxygen deficiency was an absolutely deliberate health hazard, and an absolute medical contraindication which means that 'this drug, this therapy, this method or measure should not be used, and is not allowed to be used'. To coerce an entire population to use an absolute medical contraindication by force, she said, there had to be definite and serious reasons and the reasons must be presented to competent interdisciplinary and independent bodies to be verified and authorised. She had this warning of the consequences that were coming if mask wearing continued: When, in ten years, dementia is going to increase exponentially, and the younger generations couldn't reach their god-given potential, it won't help to say 'we didn't need the masks'. I know how

damaging oxygen deprivation is for the brain, cardiologists know how damaging it is for the heart, pulmonologists know how damaging it is for the lungs. Oxygen deprivation damages every single organ. Where are our health departments, our health insurance, our medical associations? It would have been their duty to be vehemently against the lockdown and to stop it and stop it from the very beginning. Why do the medical boards issue punishments to doctors who give people exemptions? Does the person or the doctor seriously have to prove that oxygen deprivation harms people? What kind of medicine are our doctors and medical associations representing? Who is responsible for this crime? The ones who want to enforce it? The ones who let it happen and play along, or the ones who don't prevent it? All of the organisations and people she mentions there either answer directly to the Cult or do whatever hierarchical levels above them tell them to do. The outcome of both is the same. 'It's not about masks, it's not about viruses, it's certainly not about your health', Griesz-Brisson said. 'It is about much, much more. I am not participating. I am not afraid.' They were taking our air to breathe and there was no unfounded medical exemption from face masks. Oxygen deprivation was dangerous for every single brain. It had to be the free decision of every human being whether they want to wear a mask that was absolutely ineffective to protect themselves from a virus. She ended by rightly identifying where the responsibility lies for all this: The imperative of the hour is personal responsibility. We are responsible for what we think, not the media. We are responsible for what we do, not our superiors. We are responsible for our health, not the World Health Organization. And we are responsible for what happens in our country, not the government. But surgeons wear masks, right? Independent studies of mask-wearing have produced a long list of reports detailing mental, emotional and physical dangers. What a definition of insanity to see police officers imposing mask-wearing on the public which will cumulatively damage their health while the police themselves wear masks that will cumulatively damage their health. It's uîer madness and both public and police do this because 'the government says so' – yes a government of brain-donor idiots like UK Health Secretary Maî Hancock reading the 'follow the science' scripts of

psychopathic, lunatic psychologists. The response you get from Stockholm syndrome sufferers defending the very authorities that are destroying them and their families is that 'surgeons wear masks'. This is considered the game, set and match that they must work and don't cause oxygen deficit. Well, actually, scientific studies have shown that they do and oxygen levels are monitored in operating theatres to compensate. Surgeons wear masks to stop spittle and such like dropping into open wounds – not to stop 'viral particles' which are so miniscule they can only be seen through an electron microscope. Holes in the masks are significantly bigger than 'viral particles' and if you sneeze or cough they will breach the mask. I watched an incredibly disingenuous 'experiment' that claimed to prove that masks work in catching 'virus' material from the mouth and nose. They did this with a slow motion camera and the mask did block big stuff which stayed inside the mask and against the face to be breathed in or cause infections on the face as we have seen with many children. 'Viral particles', however, would never have been picked up by the camera as they came through the mask when they are far too small to be seen. The 'experiment' was therefore disingenuous and useless. Studies have concluded that wearing masks in operating theatres (and thus elsewhere) make no difference to preventing infection while the opposite is true with toxic shite building up in the mask and this had led to an explosion in tooth decay and gum disease dubbed by dentists 'mask mouth'. You might have seen the Internet video of a furious American doctor urging people to take off their masks after a four-year-old patient had been rushed to hospital the night before and nearly died with a lung infection that doctors sourced to mask wearing. A study in the journal Cancer Discovery found that inhalation of harmful microbes can contribute to advanced stage lung cancer in adults and long-term use of masks can help breed dangerous pathogens. Microbiologists have said frequent mask wearing creates a moist environment in which microbes can grow and proliferate before entering the lungs. The Canadian Agency for Drugs and Technologies in Health, or CADTH, a Canadian national organisation that provides research and analysis to healthcare decision-makers, said this as long ago as 2013 in a report entitled 'Use of Surgical Masks in the Operating Room: A Review of the Clinical Effectiveness

and Guidelines'. It said: No evidence was found to support the use of surgical face masks to reduce the frequency of surgical site infections No evidence was found on the effectiveness of wearing surgical face masks to protect staff from infectious material in the Guidelines recommend the use of surgical face masks by staff in the operating room to protect both operating room staff and patients (despite the lack of evidence). We were told that the world could go back to 'normal' with the arrival of the 'vaccines'. When they came, fraudulent as they are, the story changed as I knew that it would. We are in the midst of transforming 'normal', not going back to it. Mary Ramsay, head of immunisation at Public Health England, echoed the words of US criminal Anthony Fauci who said masks and other regulations must stay no matter if people are vaccinated. The Fauci idiot continued to wear two masks – different colours so both could be clearly seen – after he claimed to have been vaccinated. Senator Rand Paul told Fauci in one exchange that his double-masks were 'theatre' and he was right. It's all theatre. Mary Ramsay back-tracked on the vaccine- return-to-normal theme when she said the public may need to wear masks and social-distance for years despite the jabs. 'People have got used to those lower-level restrictions now, and [they] can live with them', she said telling us what the idea has been all along. 'The vaccine does not give you a pass, even if you have had it, you must continue to follow all the guidelines' said a Public Health England statement which reneged on what we had been told before and made having the 'vaccine' irrelevant to 'normality' even by the official story. Spain's fascist government trumped everyone by passing a law mandating the wearing of masks on the beach and even when swimming in the sea. The move would have devastated what's left of the Spanish tourist industry, posed potential breathing dangers to swimmers and had Northern European sunbathers walking around with their forehead brown and the rest of their face white as a sheet. The ruling was so crazy that it had to be retracted after pressure from public and tourist industry, but it confirmed where the Cult wants to go with masks and how clinically insane authority has become. The determination to make masks permanent and hide the serious dangers to body and mind can be seen in the censorship of scientist Professor Denis Rancourt by Bill Gates- funded academic

publishing website ResearchGate over his papers exposing the dangers and uselessness of masks. Rancourt said: ResearchGate today has permanently locked my account, which I have had since 2015. Their reasons graphically show the nature of their attack against democracy, and their corruption of science ... By their obscene non-logic, a scientific review of science articles reporting on harms caused by face masks has a 'potential to cause harm'. No criticism of the psychological device (face masks) is tolerated, if the said criticism shows potential to influence public policy. This is what happens in a fascist world. Where are the 'greens' (again)? Other dangers of wearing masks especially regularly relate to the inhalation of minute plastic fibres into the lungs and the deluge of discarded masks in the environment and oceans. Estimates predicted that more than 1.5 billion disposable masks will end up in the world's oceans every year polluting the water with tons of plastic and endangering marine wildlife. Studies project that humans are using 129 billion face masks each month worldwide – about three million a minute. Most are disposable and made from plastic, non- biodegradable microfibers that break down into smaller plastic particles that become widespread in ecosystems. They are littering cities, clogging sewage channels and turning up in bodies of water. I have written in other books about the immense amounts of microplastics from endless sources now being absorbed into the body. Rolf Halden, director of the Arizona State University (ASU) Biodesign Center for Environmental Health Engineering, was the senior researcher in a 2020 study that analysed 47 human tissue samples and found microplastics in all of them. 'We have detected these chemicals of plastics in every single organ that we have investigated', he said. I wrote in The Answer about the world being deluged with microplastics. A study by the Worldwide Fund for Nature (WWF) found that people are consuming on average every week some 2,000 tiny pieces of plastic mostly through water and also through marine life and the air. Every year humans are ingesting enough microplastics to fill a heaped dinner plate and in a life-time of 79 years it is enough to fill two large waste bins. Marco Lambertini, WWF International director general said: 'Not only are plastics polluting our oceans and waterways and killing marine life – it's in all of us and we can't escape consuming



plastics,' American geologists found tiny plastic fibres, beads and shards in rainwater samples collected from the remote slopes of the Rocky Mountain National Park near Denver, Colorado. Their report was headed: 'It is raining plastic.' Rachel Adams, senior lecturer in Biomedical Science at Cardiff Metropolitan University, said that among health consequences are internal inflammation and immune responses to a 'foreign body'. She further pointed out that microplastics become carriers of toxins including mercury, pesticides and dioxins (a known cause of cancer and reproductive and developmental problems). These toxins accumulate in the fatty tissues once they enter the body through microplastics. Now this is being compounded massively by people putting plastic on their face and throwing it away. Workers exposed to polypropylene plastic fibres known as 'flock' have developed 'flock worker's lung' from inhaling small pieces of the flock fibres which can damage lung tissue, reduce breathing capacity and exacerbate other respiratory problems. Now ... commonly used surgical masks have three layers of melt-blown textiles made of ... polypropylene. We have billions of people putting these microplastics against their mouth, nose and face for hours at a time day after day in the form of masks. How does anyone think that will work out? I mean – what could possibly go wrong? We posted a number of scientific studies on this at davidicke.com, but when I went back to them as I was writing this book the links to the science research website where they were hosted were dead. Anything that challenges the official narrative in any way is either censored or vilified. The official narrative is so unsupportable by the evidence that only deleting the truth can protect it. A study by Chinese scientists still survived – with the usual twist which is why it was still active, I guess. Yes, they found that virtually all the masks they tested increased the daily intake of microplastic fibres, but people should still wear them because the danger from the 'virus' was worse said the crazy 'team' from the Institute of Hydrobiology in Wuhan. Scientists first discovered microplastics in lung tissue of some patients who died of lung cancer in the 1990s. Subsequent studies have confirmed the potential health damage with the plastic degrading slowly and remaining in the lungs to accumulate in volume. Wuhan researchers used a machine simulating human breathing to

establish that masks shed up to nearly 4,000 microplastic fibres in a month with reused masks producing more. Scientists said some masks are laced with toxic chemicals and a variety of compounds seriously restricted for both health and environmental reasons. They include cobalt (used in blue dye) and formaldehyde known to cause watery eyes, burning sensations in the eyes, nose, and throat, plus coughing, wheezing and nausea. No – that must be 'Covid-19'. There is another and potentially even more sinister content of masks. Mostly new masks of different makes filmed under a microscope around the world have been found to contain strange black fibres or 'worms' that appear to move or 'crawl' by themselves and react to heat and water. The nearest I have seen to them are the self-replicating fibres that are pulled out through the skin of those suffering from Morgellons disease which has been connected to the phenomena of 'chemtrails' which I will bring into the story later on. Morgellons fibres continue to grow outside the body and have a form of artificial intelligence. Black 'worm' fibres in masks have that kind of feel to them and there is a nanotechnology technique called 'worm micelles' which carry and release drugs or anything else you want to deliver to the body. For sure the suppression of humanity by mind altering drugs is the Cult agenda big time and the more excuses they can find to gain access to the body the more opportunities there are to make that happen whether through 'vaccines' or masks pushed against the mouth and nose for hours on So let us summarise the pros and cons of masks: Against masks: Breathing in your own carbon dioxide; depriving the body and brain of sufficient oxygen; build-up of toxins in the mask that can be breathed into the lungs and cause rashes on the face and 'mask-mouth'; breathing microplastic fibres and toxic chemicals into the lungs; dehumanisation and deleting individualisation by literally making people faceless; destroying human emotional interaction through facial expression and deleting parental connection with their babies which look for guidance to their facial expression. For masks: They don't protect you from a 'virus' that doesn't exist and even if it did 'viral' particles are so minute they are smaller than the holes in the mask. Governments, police, supermarkets, businesses, transport companies, and all the rest who seek to impose masks have done no

risk assessment on their consequences for health and psychology and are now open to group lawsuits when the impact becomes clear with a cumulative epidemic of respiratory and other disease. Authorities will try to exploit these effects and hide the real cause by dubbing them 'Covid-19'. Can you imagine seĵing out to force the assessment of the risks? It is criminal and it is evil, but then how many people targeted in this way, who see their children told to wear them all day at school, have asked for a risk assessment? Billions can't be imposed upon by the few unless the billions allow it. Oh, yes, with just a tinge of irony, 85 percent of all masks made worldwide come from China. Wash your hands in toxic shite 'Covid' rules include the use of toxic sanitisers and again the health consequences of constantly applying toxins to be absorbed through the skin is obvious to any level of Renegade Mind. America's Food and Drug Administration (FDA) said that sanitisers are drugs and issued a warning about 75 dangerous brands which contain methanol used in antifreeze and can cause death, kidney damage and blindness. The FDA circulated the following warning even for those brands that it claims to be safe: Store hand sanitizer out of the reach of pets and children, and children should use it only with adult supervision. Do not drink hand sanitizer. This is particularly important for young children, especially toddlers, who may be attracted by the pleasant smell or brightly colored bottles of hand sanitizer. Drinking even a small amount of hand sanitizer can cause alcohol poisoning in children. (However, there is no need to be concerned if your children eat with or lick their hands after using hand sanitizer.) During this coronavirus pandemic, poison control centers have had an increase in calls about accidental ingestion of hand sanitizer, so it is important that adults monitor young children's use. Do not allow pets to swallow hand sanitizer. If you think your pet has eaten something potentially dangerous, call your veterinarian or a pet poison control center right away. Hand sanitizer is flammable and should be stored away from heat and flames. When using hand sanitizer, rub your hands until they feel completely dry before performing activities that may involve heat, sparks, static electricity, or open flames. There you go, perfectly safe, then, and that's without even a mention of the toxins absorbed through the skin. Come on kids – sanitise your hands everywhere you go. It

will save you from the 'virus'. Put all these elements together of the 'Covid' normal and see how much health and psychology is being cumulatively damaged, even devastated, to 'protect your health'. Makes sense, right? They are only imposing these things because they care, right? Right? Submitting to insanity Psychological reframing of the population goes very deep and is done in many less obvious ways. I hear people say how contradictory and crazy 'Covid' rules are and how they are ever changing. This is explained away by dismissing those involved as idiots. It is a big mistake. The Cult is delighted if its cold calculation is perceived as incompetence and idiocy when it is anything but. Oh, yes, there are idiots within the system – lots of them – but they are administering the Cult agenda, mostly unknowingly. They are not deciding and dictating it. The bulwark against tyranny is self-respect, always has been, always will be. It is self-respect that has broken every tyranny in history. By its very nature self-respect will not bow to oppression and its perpetrators. There is so little self-respect that it's always the few that overturn dictators. Many may eventually follow, but the few with the iron spines (self-respect) kick it off and generate the momentum. The Cult targets self-respect in the knowledge that once this has gone only submission remains. Crazy, contradictory, ever-changing 'Covid' rules are systematically applied by psychologists to delete self-respect. They want you to see that the rules make no sense. It is one thing to decide to do something when you have made the choice based on evidence and logic. You still retain your self-respect. It is quite another when you can see what you are being told to do is insane, ridiculous and makes no sense, and yet you still do it. Your self-respect is extinguished and this has been happening as ever more obviously stupid and nonsensical things have been demanded and the great majority have complied even when they can see they are stupid and People walk around in face-nappies knowing they are damaging their health and make no difference to a 'virus'. They do it in fear of happens something dies inside of you and submissive reframing has begun. Next there's a need to hide from yourself that you have conceded your self-respect and you convince yourself that you have not really submitted to fear and intimidation. You begin to believe that you are complying with craziness because it's the right thing to do. When

first you concede your self-respect of  $2+2 = 4$  to  $2+2 = 5$  you know you are compromising your self-respect. Gradually to avoid facing that fact you begin to believe that  $2+2=5$ . You have been reframed and I have been watching this process happening in the human psyche on an industrial scale. The Cult is working to break your spirit and one of its major tools in that war is humiliation. I read how former American soldier Bradley Manning (later Chelsea Manning after a sex-change) was treated after being jailed for supplying WikiLeaks with documents exposing the enormity of government and elite mendacity. Manning was isolated in solitary confinement for eight months, put under 24-hour surveillance, forced to hand over clothing before going to bed, and stand naked for every roll call. This is systematic humiliation. The introduction of anal swab 'Covid' tests in China has been done for the same reason to delete self-respect and induce compliant submission. Anal swabs are mandatory for incoming passengers in parts of China and American diplomats have said they were forced to undergo the indignity which would have been calculated humiliation by the Cult-owned Chinese government that has America in its sights. Government-people: An abusive relationship

Spirit-breaking psychological techniques include giving people hope and apparent respite from tyranny only to take it away again. This happened in the UK during Christmas, 2020, when the psycho- psychologists and their political lackeys announced an easing of restrictions over the holiday only to reimpose them almost immediately on the basis of yet another lie. There is a big psychological difference between getting used to oppression and being given hope of relief only to have that dashed. Psychologists know this and we have seen the technique used repeatedly. Then there is traumatising people before you introduce more extreme regulations that require compliance. A perfect case was the announcement by the dark and sinister Whitty and Vallance in the UK that 'new data' predicted that 4,000 could die every day over the winter of 2020/2021 if we did not lockdown again. I think they call it lying and after traumatising people with that claim out came Jackboot Johnson the next day with new curbs on human freedom. Psychologists know that a frightened and traumatised mind becomes suggestable to submission and behaviour reframing. Underpinning all this has been

to make people fearful and suspicious of each other and see themselves as a potential danger to others. In league with deleted self-respect you have the perfect psychological recipe for self-loathing. The relationship between authority and public is now demonstrably the same as that of subservience to an abusive partner. These are signs of an abusive relationship explained by psychologist Leslie Becker-Phelps: Psychological and emotional abuse: Undermining a partner's self-worth with verbal attacks, name-calling, and belittling. Humiliating the partner in public, unjustly accusing them of having an affair, or interrogating them about their every behavior. Keeping partner confused or off balance by saying they were just kidding or blaming the partner for 'making' them act this way ... Feigning in public that they care while turning against them in private. This leads to victims frequently feeling confused, incompetent, unworthy, hopeless, and chronically self-doubting. [Apply these techniques to how governments have treated the population since New Year, 2020, and the parallels are obvious.] Physical abuse: The abuser might physically harm their partner in a range of ways, such as grabbing, hitting, punching, or shoving them. They might throw objects at them or harm them with a weapon. [Observe the physical harm imposed by masks, lockdown, and so on.] Threats and intimidation: One way abusers keep their partners in line is by instilling fear. They might be verbally threatening, or give threatening looks or gestures. Abusers often make it known that they are tracking their partner's every move. They might destroy their partner's possessions, threaten to harm them, or threaten to harm their family members. Not surprisingly, victims of this abuse often feel anxiety, fear, and panic. [No words necessary.] Isolation: Abusers often limit their partner's activities, forbidding them to talk or interact with friends or family. They might limit access to a car or even turn off their phone. All of this might be done by physically holding them against their will, but is often accomplished through psychological abuse and intimidation. The more isolated a person feels, the fewer resources they have to help gain perspective on their situation and to escape from it. [No words Economic abuse: Abusers often make their partners beholden to them for money by controlling access to funds of any kind. They might prevent their partner from getting a job or

withhold access to money they earn from a job. This creates financial dependency that makes leaving the relationship very difficult. [See destruction of livelihoods and the proposed meagre 'guaranteed income' so long as you do whatever you are told.] Using children: An abuser might disparage their partner's parenting skills, tell their children lies about their partner, threaten to take custody of their children, or threaten to harm their children. These tactics instil fear and often elicit compliance. [See reframed social service mafia and how children are being mercilessly abused by the state over 'Covid' while their parents look on too frightened to do anything.] A further recurring trait in an abusive relationship is the abused blaming themselves for their abuse and making excuses for the abuser. We have the public blaming each other for lockdown abuse by government and many making excuses for the government while attacking those who challenge the government. How often we have heard authorities say that rules are being imposed or reimposed only because people have refused to 'behave' and follow the rules. We don't want to do it – it's you. Renegade Minds are an antidote to all of these things. They will never concede their self-respect no matter what the circumstances. Even when apparent humiliation is heaped upon them they laugh in its face and reflect back the humiliation on the abuser where it belongs. Renegade Minds will never wear masks they know are only imposed to humiliate, suppress and damage both physically and psychologically. Consequences will take care of themselves and they will never break their spirit or cause them to concede to tyranny. UK newspaper columnist Peter Hitchens was one of the few in the mainstream media to speak out against lockdowns and forced vaccinations. He then announced he had taken the jab. He wanted to see family members abroad and he believed vaccine passports were inevitable even though they had not yet been introduced. Hitchens has a questioning and critical mind, but not a Renegade one. If he had no amount of pressure would have made him concede. Hitchens excused his action by saying that the battle has been lost. Renegade Minds never accept defeat when freedom is at stake and even if they are the last one standing the self-respect of not submitting to tyranny is more important than any outcome or any consequence. That's why Renegade Minds are the only minds that ever

changed anything worth changing. Insanity is relative. It depends on who has who locked in what cage. Reframing a mind means simply to change its perception and behaviour. This can be done subconsciously to such an extent that subjects have no idea they have been 'reframed' while to any observer changes in behaviour and attitudes are obvious. Human society is being reframed on a ginormous scale since the start of 2020 and here we have the reason why psychologists rather than doctors have been calling the shots. Ask most people who have succumbed to 'Covid' reframing if they have changed and most will say 'no'; but they have and fundamentally. The Cult's long-game has been preparing for these times since way back and crucial to that has been to prepare both population and officialdom mentally and emotionally. To use the mind-control parlance they had to reframe the population with a mentality that would submit to fascism and reframe those in government and law enforcement to impose fascism or at least go along with it. The result has been the fact-deleted mindlessness of 'Wokeness' and officialdom that has either enthusiastically or unquestioningly imposed global tyranny demanded by reframed politicians on behalf of psychopathic and deeply evil cultists. 'Cognitive reframing' identifies and challenges the way someone sees the world in the form of situations, experiences and emotions and then restructures those perceptions to view the same set of circumstances in a different way. This can have benefits if the attitudes are personally destructive while on the other side it has the potential for individual and collective mind control which the subject has no idea has even happened. Cognitive therapy was developed in the 1960s by Aaron T. Beck who was born in Rhode Island in 1921 as the son of Jewish immigrants from the Ukraine. He became interested in the techniques as a treatment for depression. Beck's daughter Judith S. Beck is prominent in the same field and they founded the Beck Institute for Cognitive Behavior Therapy in Philadelphia in 1994. Cognitive reframing, however, began to be used worldwide by those with a very dark agenda. The Cult reframes politicians to change their attitudes and actions until they are completely at odds with what they once appeared to stand for. The same has been happening to government administrators at all levels, law enforcement, military and the human population. Cultists love



mind control for two main reasons: It allows them to control what people think, do and say to secure agenda advancement and, by definition, it calms their legendary insecurity and fear of the unexpected. I have studied mind control since the time I travelled America in 1996. I may have been talking to next to no one in terms of an audience in those years, but my goodness did I gather a phenomenal amount of information and knowledge about so many things including the techniques of mind control. I have described this in detail in other books going back to *The Biggest Secret* in 1998. I met a very large number of people recovering from MKUltra and its offshoots and successors and I began to see how these same techniques were being used on the population in general. This was never more obvious than since the 'Covid' hoax began. Reframing the enforcers I have observed over the last two decades and more the very clear transformation in the dynamic between the police, officialdom and the public. I tracked this in the books as the relationship mutated from one of serving the public to seeing them as almost the enemy and certainly a lower caste. There has always been a class divide based on income and always been some psychopathic, corrupt, and big-I-am police officers. This was different. Wholesale change was unfolding in the collective dynamic; it was less about money and far more about position and perceived power. An us-and-them was emerging. Noses were lifted skyward by government administration and law enforcement and their attitude to the public they were supposed to be serving changed to one of increasing contempt, superiority and control. The transformation was so clear and widespread that it had to be planned. Collective attitudes and dynamics do not change naturally and organically that quickly on that scale. I then came across an organisation in Britain called Common Purpose created in the late 1980s by Julia Middleton who would work in the office of Deputy Prime Minister John Prescott during the long and disastrous premiership of war criminal Tony Blair. When Blair speaks the Cult is speaking and the man should have been in jail a long time ago. Common Purpose proclaims itself to be one of the biggest 'leadership development' organisations in the world while functioning as a charity with all the financial benefits which come from that. It hosts 'leadership development' courses and programmes all over the world

and claims to have 'brought together' what it calls 'leaders' from more than 100 countries on six continents. The modus operandi of Common Purpose can be compared with the work of the UK government's reframing network that includes the Behavioural Insights Team 'nudge unit' and 'Covid' reframing specialists at SPI-B. WikiLeaks described Common Purpose long ago as 'a hidden virus in our government and schools' which is unknown to the general public: 'It recruits and trains "leaders" to be loyal to the directives of Common Purpose and the EU, instead of to their own departments, which they then undermine or subvert, the NHS [National Health Service] being an example.' This is a vital point to understand the 'Covid' hoax. The NHS, and its equivalent around the world, has been utterly reframed in terms of administrators and much of the medical personnel with the transformation underpinned by recruitment policies. The outcome has been the criminal and psychopathic behaviour of the NHS over 'Covid' and we have seen the same in every other major country. WikiLeaks said Common Purpose trainees are 'learning to rule without regard to democracy' and to usher in a police state (current events explained). Common Purpose operated like a 'glue' and had members in the NHS, BBC, police, legal profession, church, many of Britain's 7,000 quangos, local councils, the Civil Service, government ministries and Parliament, and controlled many RDA's (Regional Development Agencies). Here we have one answer for how and why British institutions and their like in other countries have changed so negatively in relation to the public. This further explains how and why the beyond-disgraceful reframed BBC has become a propaganda arm of 'Covid' fascism. They are all part of a network pursuing the same goal. By 2019 Common Purpose was quoting a figure of 85,000 'leaders' that had attended its programmes. These 'students' of all ages are known as Common Purpose 'graduates' and they consist of government, state and local government officials and administrators, police chiefs and officers, and a whole range of others operating within the national, local and global establishment. Cressida Dick, Commissioner of the London Metropolitan Police, is the Common Purpose graduate who was the 'Gold Commander' that oversaw what can only be described as the murder of Brazilian electrician Jean Charles de Menezes in 2005. He was held

down by psychopathic police and shot seven times in the head by a psychopathic lunatic after being mistaken for a terrorist when he was just a bloke going about his day. Dick authorised officers to pursue and keep surveillance on de Menezes and ordered that he be stopped from entering the underground train system. Police psychopaths took her at her word clearly. She was 'disciplined' for this outrage by being promoted – eventually to the top of the 'Met' police where she has been a disaster. Many Chief Constables controlling the police in different parts of the UK are and have been Common Purpose graduates. I have heard the 'graduate' network described as a sort of Mafia or secret society operating within the fabric of government at all levels pursuing a collective policy ingrained at Common Purpose training events. Founder Julia Middleton herself has said: Locally and internationally, Common Purpose graduates will be 'lighting small fires' to create change in their organisations and communities ... The Common Purpose effect is best illustrated by the many stories of small changes brought about by leaders, who themselves A Common Purpose mission statement declared: Common Purpose aims to improve the way society works by expanding the vision, decision-making ability and influence of all kinds of leaders. The organisation runs a variety of educational programmes for leaders of all ages, backgrounds and sectors, in order to provide them with the inspirational, information and opportunities they need to change the world. Yes, but into what? Since 2020 the answer has become clear. NLP and the Delphi technique Common Purpose would seem to be a perfect name or would common programming be better? One of the foundation methods of reaching 'consensus' (group think) is by setting the agenda theme and then encouraging, cajoling or pressuring everyone to agree a 'consensus' in line with the core theme promoted by Common Purpose. The methodology involves the 'Delphi technique', or an adaption of it, in which opinions are expressed that are summarised by a 'facilitator or change agent' at each stage. Participants are 'encouraged' to modify their views in the light of what others have said. Stage by stage the former individual opinions are merged into group consensus which just happens to be what Common Purpose wants them to believe. A key part of this is to marginalise anyone refusing to concede to group think and

turn the group against them to apply pressure to conform. We are seeing this very technique used on the general population to make 'Covid' group-thinkers hostile to those who have seen through the bullshit. People can be reframed by using perception manipulation methods such as Neuro-Linguistic Programming (NLP) in which you change perception with the use of carefully constructed language. An NLP website described the technique this way: ... A method of influencing brain behaviour (the 'neuro' part of the phrase) through the use of language (the 'linguistic' part) and other types of communication to enable a person to 'recode' the way the brain responds to stimuli (that's the 'programming') and manifest new and better behaviours. Neuro-Linguistic Programming often incorporates hypnosis and self-hypnosis to help achieve the change (or 'programming') that is wanted. British alternative media operation UKColumn has done very detailed research into Common Purpose over a long period. I quoted co-founder and former naval officer Brian Gerrish in my book *Remember Who You Are*, published in 2011, as saying the following years before current times: It is interesting that many of the mothers who have had children taken by the State speak of the Social Services people being icily cool, emotionless and, as two ladies said in slightly different words, '... like little robots'. We know that NLP is cumulative, so people can be given small imperceptible doses of NLP in a course here, another in a few months, next year etc. In this way, major changes are accrued in their personality, but the day by day change is In these and other ways 'graduates' have had their perceptions uniformly reframed and they return to their roles in the institutions of government, law enforcement, legal profession, military, 'education', the UK National Health Service and the whole swathe of the establishment structure to pursue a common agenda preparing for the 'post-industrial', 'post-democratic' society. I say 'preparing' but we are now there. 'Post-industrial' is code for the Great Reset and 'post-democratic' is 'Covid' fascism. UKColumn has spoken to partners of those who have attended Common Purpose 'training'. They have described how personalities and attitudes of 'graduates' changed very noticeably for the worse by the time they had completed the course. They had been 'reframed' and told they are the 'leaders' – the special ones – who know better than the

population. There has also been the very demonstrable recruitment of psychopaths and narcissists into government administration at all levels and law enforcement. If you want psychopathy hire psychopaths and you get a simple cause and effect. If you want administrators, police officers and 'leaders' to perceive the public as lesser beings who don't matter then employ narcissists. These personalities are identified using 'psychometrics' that identifies knowledge, abilities, attitudes and personality traits, mostly through carefully-designed questionnaires and tests. As this policy has passed through the decades we have had power-crazy, power-trippers appointed into law enforcement, security and government administration in preparation for current times and the dynamic between public and law enforcement/officialdom has been transformed. UKColumn's Brian Gerrish said of the narcissistic Their love of themselves and power automatically means that they will crush others who get in their way. I received a major piece of the puzzle when a friend pointed out that when they made public officials re-apply for their own jobs several years ago they were also required to do psychometric tests. This was undoubtedly the start of the screening process to get 'their' sort of people in post. How obvious that has been since 2020 although it was clear what was happening long before if people paid attention to the changing At the centre of events in 'Covid' Britain is the National Health Service (NHS) which has behaved disgracefully in slavishly following the Cult agenda. The NHS management structure is awash with Common Purpose graduates or 'change agents' working to a common cause. Helen Bevan, a Chief of Service Transformation at the NHS Institute for Innovation and Improvement, co-authored a document called 'Towards a million change agents, a review of the social movements literature: implications for large scale change in the NHS'. The document compared a project management approach to that of change and social movements where 'people change themselves and each other – peer to peer'. Two definitions given for a 'social movement' were: A group of people who consciously attempt to build a radically new social order; involves people of a broad range of social backgrounds; and deploys politically confrontational and socially disruptive tactics – Cyrus Collective challenges,

based on common purposes and social solidarities, in sustained interaction with elites, opponents, and authorities – Sidney Helen Bevan wrote another NHS document in which she defined ‘framing’ as ‘the process by which leaders construct, articulate and put across their message in a powerful and compelling way in order to win people to their cause and call them to action’. I think I could come up with another definition that would be rather more accurate. The National Health Service and institutions of Britain and the wider world have been taken over by reframed ‘change agents’ and that includes everything from the United Nations to national governments, local councils and social services which have been kidnapping children from loving parents on an extraordinary and gathering scale on the road to the end of parenthood altogether. Children from loving homes are stolen and kidnapped by the state and put into the ‘care’ (inversion) of the local authority through council homes, foster parents and forced adoption. At the same time children are allowed to be abused without response while many are under council ‘care’. UKColumn highlighted the Common Purpose connection between South Yorkshire Police and Rotherham council officers in the case of the scandal in that area of the sexual exploitation of children to which the authorities turned not one blind eye, but both: We were alarmed to discover that the Chief Executive, the Strategic Director of Children and Young People’s Services, the Manager for the Local Strategic Partnership, the Community Cohesion Manager, the Cabinet Member for Cohesion, the Chief Constable and his predecessor had all attended Leadership training courses provided by the pseudo-charity Once ‘change agents’ have secured positions of hire and fire within any organisation things start to move very quickly. Personnel are then hired and fired on the basis of whether they will work towards the agenda the change agent represents. If they do they are rapidly promoted even though they may be incompetent. Those more qualified and skilled who are pre-Common Purpose ‘old school’ see their careers stall and even disappear. This has been happening for decades in every institution of state, police, ‘health’ and social services and all of them have been transformed as a result in their attitudes to their jobs and the public. Medical professions, including nursing, which were once vocations for the caring now employ many

cold, callous and couldn't give a shit personality types. The UKColumn investigation concluded: By blurring the boundaries between people, professions, public and private sectors, responsibility and accountability, Common Purpose encourages 'graduates' to believe that as new selected leaders, they can work together, outside of the established political and social structures, to achieve a paradigm shift or CHANGE – so called 'Leading Beyond Authority'. In Reframing the Face-Nappies Nowhere has this process been more obvious than in the police where recruitment of psychopaths and development of unquestioning mind-controlled group-thinkers have transformed law enforcement into a politically-correct 'Woke' joke and a travesty of what should be public service. Today they wear their face-nappies like good little gofers and enforce 'Covid' rules which are fascism under another name. Alongside the specifically-recruited psychopaths we have software minds incapable of free thought. Brian Gerrish again: An example is the policeman who would not get on a bike for a press photo because he had not done the cycling proficiency course. Normal people say this is political correctness gone mad. Nothing could be further from the truth. The policeman has been reframed, and in his reality it is perfect common sense not to get on the bike 'because he hasn't done the cycling. Another example of this is where the police would not rescue a boy from a pond until they had taken advice from above on the 'risk assessment'. A normal person would have arrived, perhaps thought of the risk for a moment, and dived in. To the police now 'reframed', they followed 'normal' procedure. same. Sheer unthinking stupidity of London Face-Nappies headed by Common Purpose graduate Cressida Dick can be seen in their behaviour at a vigil in March, 2021, for a murdered woman, Sarah Everard. A police officer had been charged with the crime. Anyone with a brain would have left the vigil alone in the circumstances. Instead they 'manhandled' women to stop them breaking 'Covid rules' to betray classic reframing. Minds in the thrall of perception control have no capacity for seeing a situation on its merits and acting accordingly. 'Rules is rules' is their only mind-set. My father used to say that rules and regulations are for the guidance of the intelligent and the blind obedience of the idiot. Most of the intelligent, decent, coppers have gone leaving only the

other kind and a few old school for whom the job must be a daily nightmare. The combination of psychopaths and rule-book software minds has been clearly on public display in the 'Covid' era with automaton robots in uniform imposing fascistic 'Covid' regulations on the population without any personal initiative or judging situations on their merits. There are thousands of examples around the world, but I'll make my point with the infamous Derbyshire police in the English East Midlands – the ones who think pouring dye into beauty spots and using drones to track people walking in the countryside away from anyone is called 'policing'. To them there are rules decreed by the government which they have to enforce and in their bewildered state a group gathering in a closed space and someone walking alone in the countryside are the same thing. It is beyond idiocy and enters the realm of clinical insanity. Police officers in Derbyshire said they were 'horrified' – horrified – to find 15 to 20 'irresponsible' kids playing a football match at a closed leisure centre 'in breach of coronavirus restrictions'. When they saw the police the kids ran away leaving their belongings behind and the reframed men and women of Derbyshire police were seeking to establish their identities with a view to fining their parents. The most natural thing for youngsters to do – kicking a ball about – is turned into a criminal activity and enforced by the moronic software programs of Derbyshire police. You find the same mentality in every country. These barely conscious 'horrified' officers said they had to take action because 'we need to ensure these rules are being followed' and 'it is of the utmost importance that you ensure your children are following the rules and regulations for Covid-19'. Had any of them done ten seconds of research to see if this parroting of their masters' script could be supported by any evidence? Nope. Reframed people don't think – others think for them and that's the whole idea of reframing. I have seen police officers one after the other repeating without question word for word what officialdom tells them just as I have seen great swathes of spews what they have been told to think by the official narrative. Police and public may seem to be in different groups, but their mentality is the same. Most people do whatever they are told in fear almost the entirety of the police do what they are told for the same reason. Ultimately it's the tiny inner core of the global Cult that's telling both



what to do. So Derbyshire police were 'horrified'. Oh, really? Why did they think those kids were playing football? It was to relieve the psychological consequences of lockdown and being denied human contact with their friends and interaction, touch and discourse vital to human psychological health. Being denied this month after month has dismantled the psyche of many children and young people as depression and suicide have exploded. Were Derbyshire police horrified by that? Are you kidding? Reframed people don't have those mental and emotional processes that can see how the impact on the psychological health of youngsters is far more dangerous than any 'virus' even if you take the mendacious official figures to be true. The reframed are told (programmed) how to act and so they do. The Derbyshire Chief Constable in the first period of lockdown when the black dye and drones nonsense was going on was Peter Goodman. He was the man who severed the connection between his force and the Derbyshire Constabulary Male Voice Choir when he decided that it was not inclusive enough to allow women to join. The fact it was a male voice choir making a particular sound produced by male voices seemed to elude a guy who terrifyingly ran policing in Derbyshire. He retired weeks after his force was condemned as disgraceful by former Supreme Court Justice Jonathan Sumption for their behaviour over extreme lockdown impositions. Goodman was replaced by his deputy Rachel Swann who was in charge when her officers were 'horrified'. The police statement over the boys committing the hanging-offence of playing football included the line about the youngsters being 'irresponsible in the times we are all living through' missing the point that the real relevance of the 'times we are all living through' is the imposition of fascism enforced by psychopaths and reframed minds of police officers playing such a vital part in establishing the fascist tyranny that their own children and grandchildren will have to live in their entire lives. As a definition of insanity that is hard to beat although it might be run close by imposing masks on people that can have a serious effect on their health while wearing a face nappy all day themselves. Once again public and police do it for the same reason - the authorities tell them to and who are they to have the self-respect to say no? Workers in uniform How reframed do you have to be to arrest a

six-year-old and take him to court for picking a flower while waiting for a bus? Brain dead police and officialdom did just that in North Carolina where criminal proceedings happen regularly for children under nine. A journey Julie Boyer gave the six-year-old crayons and a colouring book during the 'flower' hearing while the 'adults' decided his fate. County Chief District Court Judge Jay Corpening asked: 'Should a child that believes in Santa Claus, the Easter Bunny and the tooth fairy be making life-altering decisions?' Well, of course not, but common sense has no meaning when you have a common purpose and a reframed mind. Treating children in this way, and police operating in American schools, is all part of the psychological preparation for children to accept a police state as normal all their adult lives. The same goes for all the cameras and biometric tracking technology in schools. Police training is focused on reframing them as snowflake Wokers and this is happening in the military. Pentagon top brass said that 'training sessions on extremism' were needed for troops who asked why they were so focused on the Capitol Building riot when Black Lives Matter riots were ignored. What's the difference between them some apparently and rightly asked. Actually, there is a difference. Five people died in the Capitol riot, only one through violence, and that was a police officer shooting an unarmed protestor. BLM riots killed at least 25 people and cost billions. Asking the question prompted the psychopaths and reframed minds that run the Pentagon to say that more 'education' (programming) was needed. Troop training is all based on psychological programming to make them fodder for the Cult - 'Military men are just dumb, stupid animals to be used as pawns in foreign policy' as Cult-to-his-DNA former Secretary of State Henry Kissinger famously said. Governments see the police in similar terms and it's time for those among them who can see this to defend the people and stop being enforcers of the Cult agenda upon the people. The US military, like the country itself, is being targeted for destruction through a long list of Woke impositions. Cult-owned gaga 'President' Biden signed an executive order when he took office to allow taxpayer money to pay for transgender surgery for active military personnel and veterans. Are you a man soldier? No, I'm a LGBTQIA+ with a hint of Skoliosexual and Spectrasexual. Oh, good man. Bad choice of words

you bigot. The Pentagon announced in March, 2021, the appointment of the first 'diversity and inclusion officer' for US Special Forces. Richard Torres-Estrada arrived with the publication of a 'D&I Strategic Plan which will guide the enterprise-wide effort to institutionalize and sustain D&I'. If you think a Special Forces 'Strategic Plan' should have something to do with defending America you haven't been paying attention. Defending Woke is now the military's new role. Torres-Estrada has posted images comparing Donald Trump with Adolf Hitler and we can expect no bias from him as a representative of the supposedly non-political Pentagon. Cable news host Tucker Carlson said: 'The Pentagon is now the Yale faculty lounge but with cruise missiles.' Meanwhile Secretary of Defense Lloyd Austin, a board member of weapons-maker Raytheon with stock and compensation interests in October, 2020, worth \$1.4 million, said he was purging the military of the 'enemy within' – anyone who isn't Woke and supports Donald Trump. Austin refers to his targets as 'racist extremists' while in true Woke fashion being himself a racist extremist. Pentagon documents pledge to 'eradicate, eliminate and conquer all forms of racism, sexism and homophobia'. The definitions of these are decided by 'diversity and inclusion committees' populated by those who see racism, sexism and homophobia in every situation and opinion. Woke (the Cult) is dismantling the US military and purging testosterone as China expands its military and gives its troops 'masculinity training'. How do we think that is going to end when this is all Cult coordinated? The US military, like the British military, is controlled by Woke and spineless top brass who just go along with it out of personal career interests. 'Woke' means fast asleep Mind control and perception manipulation techniques used on individuals to create group-think have been unleashed on the global population in general. As a result many have no capacity to see the obvious fascist agenda being installed all around them or what 'Covid' is really all about. Their brains are firewalled like a computer system not to process certain concepts, thoughts and realisations that are bad for the Cult. The young are most targeted as the adults they will be when the whole fascist global state is planned to be fully implemented. They need to be prepared for total compliance to eliminate all pushback from entire generations. The Cult has been pouring billions into taking complete

control of 'education' from schools to universities via its operatives and corporations and not least Bill Gates as always. The plan has been to transform 'education' institutions into programming centres for the mentality of 'Woke'. James McConnell, professor of psychology at the University of Michigan, wrote in Psychology Today in 1970: The day has come when we can combine sensory deprivation with drugs, hypnosis, and astute manipulation of reward and punishment, to gain almost absolute control over an individual's behaviour. It should then be possible to achieve a very rapid and highly effective type of brainwashing that would allow us to make dramatic changes in a person's behaviour and personality ... We should reshape society so that we all would be trained from birth to want to do what society wants us to do. We have the techniques to do it... no-one owns his own personality you acquired, and there's no reason to believe you should have the right to refuse to acquire a new personality if your old one is anti-social. This was the potential for mass brainwashing in 1970 and the mentality there displayed captures the arrogant psychopathy that drives it forward. I emphasise that not all young people have succumbed to Woke programming and those that haven't are incredibly impressive people given that today's young are the most perceptually-targeted generations in history with all the technology now involved. Vast swathes of the young generations, however, have fallen into the spell – and that's what it is – of Woke. The Woke mentality and perceptual program is founded on inversion and you will appreciate later why that is so significant. Everything with Woke is inverted and the opposite of what it is claimed to be. Woke was a term used in African-American culture from the 1900s and referred to an awareness of social and racial justice. This is not the meaning of the modern version or 'New Woke' as I call it in The Answer. Oh, no, Woke today means something very different no matter how much Wokers may seek to hide that and insist Old Woke and New Woke are the same. See if you find any 'awareness of social justice' here in the modern variety: Woke demands 'inclusivity' while excluding anyone with a different opinion and calls for mass censorship to silence other Woke claims to stand against oppression when imposing oppression is the foundation of all that it does. It is the driver of political correctness which is nothing more than a Cult invention to

manipulate the population to silence itself. Woke believes itself to be 'liberal' while pursuing a global society that can only be described as fascist (see 'anti-fascist' fascist Woke calls for 'social justice' while spreading injustice wherever it goes against the common 'enemy' which can be easily identified as a differing view. Woke is supposed to be a metaphor for 'awake' when it is solid- gold asleep and deep in a Cult-induced coma that meets the criteria for 'off with the fairies'. I state these points as obvious facts if people only care to look. I don't do this with a sense of condemnation. We need to appreciate that the onslaught of perceptual programming on the young has been incessant and merciless. I can understand why so many have been reframed, or, given their youth, framed from the start to see the world as the Cult demands. The Cult has had access to their minds day after day in its 'education' system for their entire formative years. Perception is formed from information received and the Cult-created system is a life-long download of information delivered to elicit a particular perception, thus behaviour. The more this has expanded into still new extremes in recent decades and ever- increasing censorship has deleted other opinions and information why wouldn't that lead to a perceptual reframing on a mass scale? I have described already cradle-to-grave programming and in more recent times the targeting of young minds from birth to adulthood has entered the stratosphere. This has taken the form of skewing what is 'taught' to fit the Cult agenda and the omnipresent techniques of group-think to isolate non-believers and pressure them into line. There has always been a tendency to follow the herd, but we really are in a new world now in relation to that. We have parents who can see the 'Covid' hoax told by their children not to stop them wearing masks at school, being 'Covid' tested or having the 'vaccine' in fear of the peer-pressure consequences of being different. What is 'peer-pressure' if not pressure to conform to group-think? Renegade Minds never group-think and always retain a set of perceptions that are unique to them. Group-think is always underpinned by consequences for not group-thinking. Abuse now aimed at those refusing DNA-manipulating 'Covid vaccines' are a potent example of this. The biggest pressure to conform comes from the very group which is itself being manipulated. 'I am programmed

to be part of a hive mind and so you must be.' Woke control structures in 'education' now apply to every mainstream organisation. Those at the top of the 'education' hierarchy (the Cult) decide the policy. This is imposed on governments through the Cult network; governments impose it on schools, colleges and universities; their leadership impose the policy on teachers and academics and they impose it on children and students. At any level where there is resistance, perhaps from a teacher or university lecturer, they are targeted by the authorities and often fired. Students themselves regularly demand the dismissal of academics (increasingly few) at odds with the narrative that the students have been programmed to believe in. It is quite a thought that students who are being targeted by the Cult become so consumed by programmed group-think that they launch protests and demand the removal of those who are trying to push back against those targeting the students. Such is the scale of perceptual inversion. We see this with 'Covid' programming as the Cult imposes the rules via psycho-psychologists and governments on shops, transport companies and businesses which impose them on their staff who impose them on their customers who pressure Pushbackers to conform to the will of the Cult which is in the process of destroying them and their families. Scan all aspects of society and you will see the same sequence every time. Fact free Woke and hijacking the 'left' There is no more potent example of this than 'Woke', a mentality only made possible by the deletion of factual evidence by an 'education' system seeking to produce an ever more uniform society. Why would you bother with facts when you don't know any? Deletion of credible history both in volume and type is highly relevant. Orwell said: 'Who controls the past controls the future: who controls the present controls the past.' They who control the perception of the past control the perception of the future and they who control the present control the perception of the past through the writing and deleting of history. Why would you oppose the imposition of Marxism in the name of Wokeism when you don't know that Marxism cost at least 100 million lives in the 20th century alone? Watch videos and read reports in which Woker generations are asked basic historical questions – it's mind-blowing. A survey of 2,000 people found that six percent of millennials

(born approximately early 1980s to early 2000s) believed the Second World War (1939-1945) broke out with the assassination of President Kennedy (in 1963) and one in ten thought Margaret Thatcher was British Prime Minister at the time. She was in office between 1979 and 1990. We are in a post-fact society. Provable facts are no defence against the fascism of political correctness or Silicon Valley censorship. Facts don't matter anymore as we have witnessed with the 'Covid' hoax. Sacrificing uniqueness to the Woke group-think religion is all you are required to do and that means thinking for yourself is the biggest Woke no, no. All religions are an expression of group-think and censorship and Woke is just another religion with an orthodoxy defended by group-think and censorship. Burned at the stake becomes burned on Twitter which leads back eventually to burned at the stake as Woke humanity regresses to ages past. The biggest Woke inversion of all is its creators and funders. I grew up in a traditional left of centre political household on a council estate in Leicester in the 1950s and 60s – you know, the left that challenged the power of wealth-hoarding elites and threats to freedom of speech and opinion. In those days students went on marches defending freedom of speech while today's Wokers march for its deletion. What on earth could have happened? Those very elites (collectively the Cult) that we opposed in my youth and early life have funded into existence the antithesis of that former left and hijacked the 'brand' while inverting everything it ever stood for. We have a mentality that calls itself 'liberal' and 'progressive' while acting like fascists. Cult billionaires and their corporations have funded themselves into control of 'education' to ensure that Woke programming is unceasing throughout the formative years of children and young people and that non-Wokers are isolated (that word again) whether they be students, teachers or college professors. The Cult has funded into existence the now colossal global network of Woke organisations that have spawned and promoted all the 'causes' on the Cult wish-list for global transformation and turned Wokers into demanders of them. Does anyone really think it's a coincidence that the Cult agenda for humanity is a carbon (sorry) copy of the societal transformations desired by Woke?? These are only some of them: Political correctness: The means by which the Cult

deletes all public debates that it knows it cannot win if we had the free-flow of information and evidence. Human-caused 'climate change': The means by which the Cult seeks to transform society into a globally-controlled dictatorship imposing its will over the fine detail of everyone's lives 'to save the planet' which doesn't actually need saving. Transgender obsession: Preparing collective perception to accept the 'new human' which would not have genders because it would be created technologically and not through procreation. I'll have much more on this in Human 2.0. Race obsession: The means by which the Cult seeks to divide and rule the population by triggering racial division through the perception that society is more racist than ever when the opposite is the case. Is it perfect in that regard? No. But to compare today with the racism of apartheid and segregation brought to an end by the civil rights movement in the 1960s is to insult the memory of that movement and inspirations like Martin Luther King. Why is the 'anti-racism' industry (which it is) so dominated by privileged white people? White supremacy: This is a label used by privileged white people to demonise poor and deprived white people pushing back on tyranny to marginalise and destroy them. White people are being especially targeted as the dominant race by number within Western society which the Cult seeks to transform in its image. If you want to change a society you must weaken and undermine its biggest group and once you have done that by using the other groups you next turn on them to do the same ... 'Then they came for the Jews and I was not a Jew so I did nothing.' Mass migration: The mass movement of people from the Middle East, Africa and Asia into Europe, from the south into the United States and from Asia into Australia are another way the Cult seeks to dilute the racial, cultural and political influence of white people on Western society. White people ask why their governments appear to be working against them while being politically and culturally biased towards incoming cultures. Well, here's your answer. In the same way sexually 'straight' people, men and women, ask why the authorities are biased against them in favour of other sexualities. The answer is the same – that's the way the Cult wants it to be for very. These are all central parts of the Cult agenda and central parts of the Woke agenda and Woke was created and continues to be funded to an



immense degree by Cult billionaires and corporations. If anyone begins to say 'coincidence' the syllables should stick in their throat. Billionaire 'social justice warriors' Joe Biden is a 100 percent-owned asset of the Cult and the Workers' man in the White House whenever he can remember his name and for however long he lasts with his rapidly diminishing cognitive function. Even walking up the steps of an aircraft without falling on his arse would appear to be a challenge. He's not an empty-shell puppet or anything. From the minute Biden took office (or the Cult did) he began his executive orders promoting the Woke wish-list. You will see the Woke agenda imposed ever more severely because it's really the Cult agenda. Woke organisations and activist networks spawned by the Cult are funded to the extreme so long as they promote what the Cult wants to happen. Woke is funded to promote 'social justice' by billionaires who become billionaires by destroying social justice. The social justice mantra is only a cover for dismantling social justice and funded by billionaires that couldn't give a damn about social justice. Everything makes sense when you see that. One of Woke's premier funders is Cult billionaire financier George Soros who said: 'I am basically there to make money, I cannot and do not look at the social consequences of what I do.' This is the same Soros who has given more than \$32 billion to his Open Society Foundations global Woke network and funded Black Lives Matter, mass immigration into Europe and the United States, transgender activism, climate change activism, political correctness and groups targeting 'white supremacy' in the form of privileged white thugs that dominate Antifa. What a scam it all is and when you are dealing with the unquestioning fact-free zone of Woke scamming them is child's play. All you need to pull it off in all these organisations are a few in-the-know agents of the Cult and an army of naïve, reframed, uninformed, narcissistic, know-nothings convinced of their own self-righteousness, self-purity and virtue. Soros and fellow billionaires and billionaire corporations have poured hundreds of millions into Black Lives Matter and connected groups and promoted them to a global audience. None of this is motivated by caring about black people. These are the billionaires that have controlled and exploited a system that leaves millions of black people in abject poverty and deprivation which they do

absolutely nothing to address. The same Cult networks funding BLM were behind the slave trade! Black Lives Matter hijacked a phrase that few would challenge and they have turned this laudable concept into a political weapon to divide society. You know that BLM is a fraud when it claims that All Lives Matter, the most inclusive statement of all, is 'racist'. BLM and its Cult masters don't want to end racism. To them it's a means to an end to control all of humanity never mind the colour, creed, culture or background. What has destroying the nuclear family got to do with ending racism? Nothing – but that is one of the goals of BLM and also happens to be a goal of the Cult as I have been exposing in my books for decades. Stealing children from loving parents and giving schools ever more power to override parents is part of that same agenda. BLM is a Marxist organisation and why would that not be the case when the Cult created Marxism and BLM? Patrisse Cullors, a BLM co-founder, said in a 2015 video that she and her fellow organisers, including co-founder Alicia Garza, are 'trained Marxists'. The lady known after marriage as Patrisse Khan-Cullors bought a \$1.4 million home in 2021 in one of the whitest areas of California with a black population of just 1.6 per cent and has so far bought four high-end homes for a total of \$3.2 million. How very Marxist. There must be a bit of spare in the BLM coffers, however, when Cult corporations and billionaires have handed over the best part of \$100 million. Many black people can see that Black Lives Matter is not working for them, but against them, and this is still more confirmation. Black journalist Jason Whitlock, who had his account suspended by Twitter for simply linking to the story about the 'Marxists' home buying spree, said that BLM leaders are 'making millions of dollars off the backs of these dead black men who they wouldn't spit on if they were on fire and alive'. Black Lies Matter Cult assets and agencies came together to promote BLM in the wake of the death of career criminal George Floyd who had been jailed a number of times including for forcing his way into the home of a black woman with others in a raid in which a gun was pointed at her stomach. Floyd was filmed being held in a Minneapolis street in 2020 with the knee of a police officer on his neck and he subsequently died. It was an appalling thing for the officer to do, but the same technique has been used by police on peaceful protestors of lockdown

without any outcry from the Woke brigade. As unquestioning supporters of the Cult agenda Wokers have supported lockdown and all the 'Covid' claptrap while aĵacking anyone standing up to the tyranny imposed in its name. Court documents would later include details of an autopsy on Floyd by County Medical Examiner Dr Andrew Baker who concluded that Floyd had taken a fatal level of the drug fentanyl. None of this maĵered to fact-free, question-free, Woke. Floyd's death was followed by worldwide protests against police brutality amid calls to defund the police. Throwing babies out with the bathwater is a Woke speciality. In the wake of the murder of British woman Sarah Everard a Green Party member of the House of Lords, Baroness Jones of Moulsecoomb (Nincompoopia would have been beĵer), called for a 6pm curfew for all men. This would be in breach of the Geneva Conventions on war crimes which ban collective punishment, but that would never have crossed the black and white Woke mind of Baroness Nincompoopia who would have been far too convinced of her own self-righteousness to compute such details. Many American cities did defund the police in the face of Floyd riots and aĴer \$15 million was deleted from the police budget in Washington DC under useless Woke mayor Muriel Bowser car- jacking alone rose by 300 percent and within six months the US capital recorded its highest murder rate in 15 years. The same happened in Chicago and other cities in line with the Cult/Soros plan to bring fear to streets and neighbourhoods by reducing the police, releasing violent criminals and not prosecuting crime. This is the mob-rule agenda that I have warned in the books was coming for so long. Shootings in the area of Minneapolis where Floyd was arrested increased by 2,500 percent compared with the year before. Defunding the police over George Floyd has led to a big increase in dead people with many of them black. Police protection for politicians making these decisions stayed the same or increased as you would expect from professional hypocrites. The Cult doesn't actually want to abolish the police. It wants to abolish local control over the police and hand it to federal government as the psychopaths advance the Hunger Games Society. Many George Floyd protests turned into violent riots with black stores and businesses destroyed by fire and looting across America fuelled by Black Lives Maĵer. Woke

doesn't do irony. If you want civil rights you must loot the liquor store and the supermarket and make off with a smart TV. It's the only way. It's not a race war – it's a class war Black people are patronised by privileged blacks and whites alike and told they are victims of white supremacy. I find it extraordinary to watch privileged blacks supporting the very system and bloodline networks behind the slave trade and parroting the same Cult-serving manipulative crap of their privileged white, oŕgen billionaire, associates. It is indeed not a race war but a class war and colour is just a diversion. Black Senator Cory Booker and black Congresswoman Maxine Waters, more residents of Nincompoopia, personify this. Once you tell people they are victims of someone else you devalue both their own responsibility for their plight and the power they have to impact on their reality and experience. Instead we have: 'You are only in your situation because of whitey – turn on them and everything will change.' It won't change. Nothing changes in our lives unless we change it. Crucial to that is never seeing yourself as a victim and always as the creator of your reality. Life is a simple sequence of choice and consequence. Make different choices and you create different consequences. You have to make those choices – not Black Lives Maŕer, the Woke Mafia and anyone else that seeks to dictate your life. Who are they these Wokers, an emotional and psychological road traffic accident, to tell you what to do? Personal empowerment is the last thing the Cult and its Black Lives Maŕer want black people or anyone else to have. They claim to be defending the underdog while creating and perpetuating the underdog. The Cult's worst nightmare is human unity and if they are going to keep blacks, whites and every other race under economic servitude and control then the focus must be diverted from what they have in common to what they can be manipulated to believe divides them. Blacks have to be told that their poverty and plight is the fault of the white bloke living on the street in the same poverty and with the same plight they are experiencing. The difference is that your plight black people is due to him, a white supremacist with 'white privilege' living on the street. Don't unite as one human family against your mutual oppressors and suppressors – fight the oppressor with the white face who is as financially deprived as you are. The Cult knows that as its 'Covid' agenda

moves into still new levels of extremism people are going to respond and it has been spreading the seeds of disunity everywhere to stop a united response to the evil that targets all of us. Racist attacks on 'whiteness' are getting ever more outrageous and especially through the American Democratic Party which has an appalling history for anti-black racism. Barack Obama, Joe Biden, Hillary Clinton and Nancy Pelosi all eulogised about Senator Robert Byrd at his funeral in 2010 after a nearly 60-year career in Congress. Byrd was a brutal Ku Klux Klan racist and a violent abuser of Cathy O'Brien in MKUltra. He said he would never fight in the military 'with a negro by my side' and 'rather I should die a thousand times, and see Old Glory trampled in the dirt never to rise again, than to see this beloved land of ours become degraded by race mongrels, a throwback to the blackest specimen from the wilds'. Biden called Byrd a 'very close friend and mentor'. These 'Woke' hypocrites are not anti-racist they are anti-poor and anti-people not of their perceived class. Here is an illustration of the scale of anti-white racism to which we have now descended. Seriously Woke and moronic New York Times contributor Damon Young described whiteness as a 'virus' that 'like other viruses will not die until there are no bodies left for it to infect'. He went on: '... the only way to stop it is to locate it, isolate it, extract it, and kill it.' Young can say that as a black man with no consequences when a white man saying the same in reverse would be facing a jail sentence. That's racism. We had super-Woke numbskull senators Tammy Duckworth and Mazie Hirono saying they would object to future Biden Cabinet appointments if he did not nominate more Asian Americans and Pacific Islanders. Never mind the ability of the candidate what do they look like? Duckworth said: 'I will vote for racial minorities and I will vote for LGBTQ, but anyone else I'm not voting for.' Appointing people on the grounds of race is illegal, but that was not a problem for this ludicrous pair. They were on-message and that's a free pass in any situation. Critical race racism White children are told at school they are intrinsically racist as they are taught the divisive 'critical race theory'. This claims that the law and legal institutions are inherently racist and that race is a socially constructed concept used by white people to further their economic and political interests at the expense of people of colour. White is a

'virus' as we've seen. Racial inequality results from 'social, economic, and legal differences that white people create between races to maintain white interests which leads to poverty and criminality in minority communities'. I must tell that to the white guy sleeping on the street. The principal of East Side Community School in New York sent white parents a manifesto that called on them to become 'white traitors' and advocate for full 'white abolition'. These people are teaching your kids when they urgently need a psychiatrist. The 'school' included a chart with 'eight white identities' that ranged from 'white supremacist' to 'white abolition' and defined the behaviour white people must follow to end 'the regime of whiteness'. Woke blacks and their privileged white associates are acting exactly like the slave owners of old and Ku Klux Klan racists like Robert Byrd. They are too full of their own self- purity to see that, but it's true. Racism is not a body type; it's a state of mind that can manifest through any colour, creed or culture. Another racial fraud is 'equity'. Not equality of treatment and opportunity – equity. It's a term spun as equality when it means something very different. Equality in its true sense is a raising up while 'equity' is a race to the bottom. Everyone in the same level of poverty is 'equity'. Keep everyone down – that's equity. The Cult doesn't want anyone in the human family to be empowered and BLM leaders, like all these 'anti-racist' organisations, continue their privileged, pampered existence by perpetuating the perception of gathering racism. When is the last time you heard an 'anti-racist' or 'anti-Semitism' organisation say that acts of racism and discrimination have fallen? It's not in the interests of their fund- raising and power to influence and the same goes for the professional soccer anti-racism operation, Kick It Out. Two things confirmed that the Black Lives Matter riots in the summer of 2020 were Cult creations. One was that while anti-lockdown protests were condemned in this same period for 'transmitting 'Covid' the authorities supported mass gatherings of Black Lives Matter supporters. I even saw self-deluding people claiming to be doctors say the two types of protest were not the same. No – the non-existent 'Covid' was in favour of lockdowns and attacked those that protested against them while 'Covid' supported Black Lives Matter and kept well away from its protests. The whole thing was a joke and as lockdown protestors were arrested, often brutally,

by reframed Face-Nappies we had the grotesque sight of police officers taking the knee to Black Lives Maîer, a Cult-funded Marxist organisation that supports violent riots and wants to destroy the nuclear family and white people. He's not white? Shucks! Woke obsession with race was on display again when ten people were shot dead in Boulder, Colorado, in March, 2021. Cult-owned Woke TV channels like CNN said the shooter appeared to be a white man and Wokers were on Twiîer condemning 'violent white men' with the usual mantras. Then the shooter's name was released as Ahmad Al Aliwi Alissa, an anti-Trump Arab-American, and the sigh of disappointment could be heard five miles away. Never mind that ten people were dead and what that meant for their families. Race baiting was all that maîered to these sick Cult-serving people like Barack Obama who exploited the deaths to further divide America on racial grounds which is his job for the Cult. This is the man that 'racist' white Americans made the first black president of the United States and then gave him a second term. Not-very-bright Obama has become filthy rich on the back of that and today appears to have a big influence on the Biden administration. Even so he's still a downtrodden black man and a victim of white supremacy. This disingenuous fraud reveals the contempt he has for black people when he puts on a Deep South Alabama accent whenever he talks to them, no, at them. Another BLM red flag was how the now fully-Woke (fully-Cult) and fully-virtue-signalled professional soccer authorities had their teams taking the knee before every match in support of Marxist Black Lives Maîer. Soccer authorities and clubs displayed 'Black Lives Maîer' on the players' shirts and flashed the name on electronic billboards around the pitch. Any fans that condemned what is a Freemasonic taking-the-knee ritual were widely condemned as you would expect from the Woke virtue-signallers of professional sport and the now fully-Woke media. We have reverse racism in which you are banned from criticising any race or culture except for white people for whom anything goes – say what you like, no problem. What has this got to do with racial harmony and equality? We've had black supremacists from Black Lives Maîer telling white people to fall to their knees in the street and apologise for their white supremacy. Black supremacists acting like white supremacist slave owners of the past couldn't

breach their self- obsessed, race-obsessed sense of self-purity. Joe Biden appointed a race-obsessed black supremacist Kristen Clarke to head the Justice Department Civil Rights Division. Clarke claimed that blacks are endowed with 'greater mental, physical and spiritual abilities' than whites. If anyone reversed that statement they would be vilified. Clarke is on-message so no problem. She's never seen a black-white situation in which the black figure is anything but a virtuous victim and she heads the Civil Rights Division which should treat everyone the same or it isn't civil rights. Another perception of the Renegade Mind: If something or someone is part of the Cult agenda they will be supported by Woke governments and media no matter what. If they're not, they will be condemned and censored. It really is that simple and so racist Clarke prospers despite (make that because of) The end of culture Biden's administration is full of such racial, cultural and economic bias as the Cult requires the human family to be divided into warring factions. We are now seeing racially-segregated graduations and everything, but everything, is defined through the lens of perceived 'racism. We have 'racist' mathematics, 'racist' food and even 'racist' plants. World famous Kew Gardens in London said it was changing labels on plants and flowers to tell its pre-'Covid' more than two million visitors a year how racist they are. Kew director Richard Deverell said this was part of an effort to 'move quickly to decolonise collections' after they were approached by one Ajay Chhabra 'an actor with an insight into how sugar cane was linked to slavery'. They are plants you idiots. 'Decolonisation' in the Woke manual really means colonisation of society with its mentality and by extension colonisation by the Cult. We are witnessing a new Chinese-style 'Cultural Revolution' so essential to the success of all Marxist takeovers. Our cultural past and traditions have to be swept away to allow a new culture to be built-back-better. Woke targeting of long-standing Western cultural pillars including historical monuments and cancelling of historical figures is what happened in the Mao revolution in China which 'purged remnants of capitalist and traditional elements from Chinese society' and installed Maoism as the dominant ideology'. For China see the Western world today and for 'dominant ideology' see Woke. Better still see Marxism or Maoism. The 'Covid' hoax has



specifically sought to destroy the arts and all elements of Western culture from people meeting in a pub or restaurant to closing theatres, music venues, sports stadiums, places of worship and even banning singing. Destruction of Western society is also why criticism of any religion is banned except for Christianity which again is the dominant religion as white is the numerically- dominant race. Christianity may be fading rapidly, but its history and traditions are weaved through the fabric of Western society. Delete the pillars and other structures will follow until the whole thing collapses. I am not a Christian defending that religion when I say that. I have no religion. It's just a fact. To this end Christianity has itself been turned Woke to usher its own downfall and its ranks are awash with 'change agents' – knowing and unknowing – at every level including Pope Francis (definitely knowing) and the clueless Archbishop of Canterbury Justin Welby (possibly not, but who can be sure?). Woke seeks to coordinate attacks on Western culture, traditions, and ways of life through 'intersectionality' defined as 'the complex, cumulative way in which the effects of multiple forms of discrimination (such as racism, sexism, and classism) combine, overlap, or intersect especially in the experiences of marginalised individuals or groups'. Wade through the Orwellian Woke-speak and this means coordinating disparate groups in a common cause to overthrow freedom and liberal values. The entire structure of public institutions has been infested with Woke – government at all levels, political parties, police, military, schools, universities, advertising, media and trade unions. This abomination has been achieved through the Cult web by appointing Wokers to positions of power and bamboozling non-Wokers into line through intimidation, isolation and threats to their job. Many have been fired in the wake of the empathy-deleted, vicious hostility of 'social justice' Wokers and the desire of gutless, spineless employers to virtue-signal their Wokeness. Corporations are filled with Wokers today, most notably those in Silicon Valley. Ironically at the top they are not Woke at all. They are only exploiting the mentality their Cult masters have created and funded to censor and enslave while the Wokers cheer them on until it's their turn. Thus the Woke 'liberal lie' is an inversion of the traditional liberal lie. Campaigning for justice on the grounds of power and wealth distribution has been replaced

by campaigning for identity politics. The genuine traditional leĜ would never have taken money from today's billionaire abusers of fairness and justice and nor would the billionaires have wanted to fund that genuine leĜ. It would not have been in their interests to do so. The division of opinion in those days was between the haves and have nots. This all changed with Cult manipulated and funded identity politics. The division of opinion today is between Wokers and non-Wokers and not income brackets. Cult corporations and their billionaires may have taken wealth disparity to cataclysmic levels of injustice, but as long as they speak the language of Woke, hand out the dosh to the Woke network and censor the enemy they are 'one of us'. Billionaires who don't give a damn about injustice are laughing at them till their bellies hurt. Wokers are not even close to self-aware enough to see that. The transformed 'leĜ' dynamic means that Wokers who drone on about 'social justice' are funded by billionaires that have destroyed social justice the world over. It's why they are billionaires. The climate con Nothing encapsulates what I have said more comprehensively than the hoax of human-caused global warming. I have detailed in my books over the years how Cult operatives and organisations were the pump-primers from the start of the climate con. A purpose-built vehicle for this is the Club of Rome established by the Cult in 1968 with the Rockefellers and Rothschilds centrally involved all along. Their gofer frontman Maurice Strong, a Canadian oil millionaire, hosted the Earth Summit in Rio de Janeiro, Brazil, in 1992 where the global 'green movement' really expanded in earnest under the guiding hand of the Cult. The Earth Summit established Agenda 21 through the Cult-created-and-owned United Nations to use the illusion of human-caused climate change to justify the transformation of global society to save the world from climate disaster. It is a No-Problem-Reaction-Solution sold through governments, media, schools and universities as whole generations have been terrified into believing that the world was going to end in their lifetimes unless what old people had inflicted upon them was stopped by a complete restructuring of how everything is done. Chill, kids, it's all a hoax. Such restructuring is precisely what the Cult agenda demands (purely by coincidence of course). Today this has been given the codename of the Great Reset which is only an updated term for

Agenda 21 and its associated Agenda 2030. The latter, too, is administered through the UN and was voted into being by the General Assembly in 2015. Both 21 and 2030 seek centralised control of all resources and food right down to the raindrops falling on your own land. These are some of the demands of Agenda 21 established in 1992. See if you recognise this society emerging today: End national sovereignty State planning and management of all land resources, ecosystems, deserts, forests, mountains, oceans and fresh water; agriculture; rural development; biotechnology; and ensuring 'equity' The state to 'define the role' of business and financial resources Abolition of private property 'Restructuring' the family unit (see BLM) Children raised by the state People told what their job will be Major restrictions on movement Creation of 'human settlement zones' Mass resettlement as people are forced to vacate land where they live Dumbing down education Mass global depopulation in pursuit of all the above The United Nations was created as a Trojan horse for world government. With the climate con of critical importance to promoting that outcome you would expect the UN to be involved. Oh, it's involved all right. The UN is promoting Agenda 21 and Agenda 2030 justified by 'climate change' while also driving the climate hoax through its Intergovernmental Panel on Climate Change (IPCC), one of the world's most corrupt organisations. The IPCC has been lying ferociously and constantly since the day it opened its doors with the global media hanging unquestioningly on its every mendacious word. The Green movement is entirely Woke and has long lost its original environmental focus since it was co-opted by the Cult. An obsession with 'global warming' has deleted its values and scrambled its head. I experienced a small example of what I mean on a beautiful country walk that I have enjoyed several times a week for many years. The path merged into the fields and forests and you felt at one with the natural world. Then a 'Green' organisation, the Hampshire and Isle of Wight Wildlife Trust, took over part of the land and proceeded to cut down a large number of trees, including mature ones, to install a horrible big, bright steel 'this-is-ours-stay-out' fence that destroyed the whole atmosphere of this beautiful place. No one with a feel for nature would do that. Day after day I walked to the sound of chainsaws and a magnificent mature weeping willow tree that I so admired was cut

down at the base of the trunk. When I challenged a Woke young girl in a green shirt (of course) about this vandalism she replied: 'It's a weeping willow – it will grow back.' This is what people are paying for when they donate to the Hampshire and Isle of Wight Wildlife Trust and many other 'green' organisations today. It is not the environmental movement that I knew and instead has become a support-system – as with Extinction Rebellion – for a very dark agenda. Private jets for climate justice The Cult-owned, Gates-funded, World Economic Forum and its founder Klaus Schwab were behind the emergence of Greta Thunberg to harness the young behind the climate agenda and she was invited to speak to the world at ... the UN. Schwab published a book, Covid-19: The Great Reset in 2020 in which he used the 'Covid' hoax and the climate hoax to lay out a new society straight out of Agenda 21 and Agenda 2030. Bill Gates followed in early 2021 when he took time out from destroying the world to produce a book in his name about the way to save it. Gates flies across the world in private jets and admitted that 'I probably have one of the highest greenhouse gas footprints of anyone on the planet ... my personal flying alone is gigantic.' He has also bid for the planet's biggest private jet operator. Other climate change saviours who fly in private jets include John Kerry, the US Special Presidential Envoy for Climate, and actor Leonardo DiCaprio, a 'UN Messenger of Peace with special focus on climate change'. These people are so full of bullshit they could corner the market in manure. We mustn't be sceptical, though, because the Gates book, How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need, is a genuine attempt to protect the world and not an obvious pile of excrement attributed to a mega-psychopath aimed at selling his masters' plans for humanity. The Gates book and the other shite-pile by Klaus Schwab could have been written by the same person and may well have been. Both use 'climate change' and 'Covid' as the excuses for their new society and by coincidence the Cult's World Economic Forum and Bill and Melinda Gates Foundation promote the climate hoax and hosted Event 201 which pre-empted with a 'simulation' the very 'coronavirus' hoax that would be simulated for real on humanity within weeks. The British 'royal' family is promoting the 'Reset' as you would expect through Prince 'climate change caused the war in Syria' Charles

and his hapless son Prince William who said that we must 'reset our relationship with nature and our trajectory as a species' to avoid a climate disaster. Amazing how many promoters of the 'Covid' and 'climate change' control systems are connected to Gates and the World Economic Forum. A 'study' in early 2021 claimed that carbon dioxide emissions must fall by the equivalent of a global lockdown roughly every two years for the next decade to save the planet. The 'study' appeared in the same period that the Schwab mob claimed in a video that lockdowns destroying the lives of billions are good because they make the earth 'quieter' with less 'ambient noise'. They took down the video amid a public backlash for such arrogant, empathy-deleted stupidity. You see, however, where they are going with this. Corinne Le Quéré, a professor at the Tyndall Centre for Climate Change Research, University of East Anglia, was lead author of the climate lockdown study, and she writes for ... the World Economic Forum. Gates calls in 'his' book for changing 'every aspect of the economy' (long-time Cult agenda) and for humans to eat synthetic 'meat' (predicted in my books) while cows and other farm animals are eliminated. Australian TV host and commentator Alan Jones described what carbon emission targets would mean for farm animals in Australia alone if emissions were reduced as demanded by 35 percent by 2030 and zero by 2050: Well, let's take agriculture, the total emissions from agriculture are about 75 million tonnes of carbon dioxide, equivalent. Now reduce that by 35 percent and you have to come down to 50 million tonnes, I've done the maths. So if you take for example 1.5 million cows, you're going to have to reduce the herd by 525,000 [by] 2030, nine years, that's 58,000 cows a year. The beef herd's 30 million, reduce that by 35 percent, that's 10.5 million, which means 1.2 million cattle have to go every year between now and 2030. This is insanity! There are 75 million sheep. Reduce that by 35 percent, that's 26 million sheep, that's almost 3 million a year. So under the Paris Agreement over 30 million beasts. dairy cows, cattle, pigs and sheep would go. More than 8,000 every minute of every hour for the next decade, do these people know what they're talking about? Clearly they don't at the level of campaigners, politicians and administrators. The Cult does know; that's the outcome it wants. We are faced with not just a war on

humanity. Animals and the natural world are being targeted and I have been saying since the 'Covid' hoax began that the plan eventually was to claim that the 'deadly virus' is able to jump from animals, including farm animals and domestic pets, to humans. Just before this book went into production came this story: 'Russia registers world's first Covid-19 vaccine for cats & dogs as makers of Sputnik V warn pets & farm animals could spread virus'. The report said 'top scientists warned that the deadly pathogen could soon begin spreading through homes and farms' and 'the next stage is the infection of farm and domestic animals'. Know the outcome and you'll see the journey. Think what that would mean for animals and keep your eye on a term called zoonosis or zoonotic diseases which transmit between animals and humans. The Cult wants to break the connection between animals and people as it does between people and people. Farm animals fit with the Cult agenda to transform food from natural to synthetic. The gas of life is killing us There can be few greater examples of Cult inversion than the condemnation of carbon dioxide as a dangerous pollutant when it is the gas of life. Without it the natural world would be dead and so we would all be dead. We breathe in oxygen and breathe out carbon dioxide while plants produce oxygen and absorb carbon dioxide. It is a perfect symbiotic relationship that the Cult wants to dismantle for reasons I will come to in the final two chapters. Gates, Schwab, other Cult operatives and mindless repeaters, want the world to be 'carbon neutral' by at least 2050 and the earlier the better. 'Zero carbon' is the cry echoed by lunatics calling for 'Zero Covid' when we already have it. These carbon emission targets will deindustrialise the world in accordance with Cult plans – the post- industrial, post-democratic society – and with so-called renewables like solar and wind not coming even close to meeting human energy needs blackouts and cold are inevitable. Texans got the picture in the winter of 2021 when a snow storm stopped wind turbines and solar panels from working and the lights went down along with water which relies on electricity for its supply system. Gates wants everything to be powered by electricity to ensure that his masters have the kill switch to stop all human activity, movement, cooking, water and warmth any time they like. The climate lie is so stupendously inverted that it claims we must urgently reduce carbon

dioxide when we don't have enough. Co2 in the atmosphere is a little above 400 parts per million when the optimum for plant growth is 2,000 ppm and when it falls anywhere near 150 ppm the natural world starts to die and so do we. It fell to as low as 280 ppm in an 1880 measurement in Hawaii and rose to 413 ppm in 2019 with industrialisation which is why the planet has become greener in the industrial period. How insane then that psychopathic madman Gates is not satisfied only with blocking the rise of Co2. He's funding technology to suck it out of the atmosphere. The reason why will become clear. The industrial era is not destroying the world through Co2 and has instead turned around a potentially disastrous ongoing fall in Co2. Greenpeace co-founder and scientist Patrick Moore walked away from Greenpeace in 1986 and has exposed the green movement for fear-mongering and lies. He said that 500 million years ago there was 17 times more Co2 in the atmosphere than we have today and levels have been falling for hundreds of millions of years. In the last 150 million years Co2 levels in Earth's atmosphere had reduced by 90 percent. Moore said that by the time humanity began to unlock carbon dioxide from fossil fuels we were at '38 seconds to midnight' and in that sense: 'Humans are [the Earth's] salvation.' Moore made the point that only half the Co2 emitted by fossil fuels stays in the atmosphere and we should remember that all pollution pouring from chimneys that we are told is carbon dioxide is in fact nothing of the kind. It's pollution. Carbon dioxide is an invisible gas. William Happer, Professor of Physics at Princeton University and long-time government adviser on climate, has emphasised the Co2 deficiency for maximum growth and food production. Greenhouse growers don't add carbon dioxide for a bit of fun. He said that most of the warming in the last 100 years, after the earth emerged from the super-cold period of the 'Little Ice Age' into a natural warming cycle, was over by 1940. Happer said that a peak year for warming in 1988 can be explained by a 'monster El Nino' which is a natural and cyclical warming of the Pacific that has nothing to do with 'climate change'. He said the effect of Co2 could be compared to painting a wall with red paint in that once two or three coats have been applied it didn't matter how much more you slapped on because the wall will not get much redder. Almost all the effect of the rise in Co2 has already

happened, he said, and the volume in the atmosphere would now have to double to increase temperature by a single degree. Climate hoaxers know this and they have invented the most ridiculously complicated series of 'feedback' loops to try to overcome this rather devastating fact. You hear puppet Greta going on cluelessly about feedback loops and this is why. The Sun affects temperature? No you climate denier Some other nonsense to contemplate: Climate graphs show that rises in temperature do not follow rises in Co2 – it's the other way round with a lag between the two of some 800 years. If we go back 800 years from present time we hit the Medieval Warm Period when temperatures were higher than now without any industrialisation and this was followed by the Little Ice Age when temperatures plummeted. The world was still emerging from these centuries of serious cold when many climate records began which makes the ever-repeated line of the 'hottest year since records began' meaningless when you are not comparing like with like. The coldest period of the Little Ice Age corresponded with the lowest period of sunspot activity when the Sun was at its least active. Proper scientists will not be at all surprised by this when it confirms the obvious fact that earth temperature is affected by the scale of Sun activity and the energetic power that it subsequently emits; but when is the last time you heard a climate hoaxer talking about the Sun as a source of earth temperature?? Everything has to be focussed on Co2 which makes up just 0.117 percent of so-called greenhouse gases and only a fraction of even that is generated by human activity. The rest is natural. More than 90 percent of those greenhouse gases are water vapour and clouds (Fig 9). Ban moisture I say. Have you noticed that the climate hoaxers no longer use the polar bear as their promotion image? That's because far from becoming extinct polar bear communities are stable or thriving. Joe Bastardi, American meteorologist, weather forecaster and outspoken critic of the climate lie, documents in his book *The Climate Chronicles* how weather patterns and events claimed to be evidence of climate change have been happening since long before industrialisation: 'What happened before naturally is happening again, as is to be expected given the cyclical nature of the climate due to the design of the planet.' If you read the detailed background to the climate hoax in my other



books you will shake your head and wonder how anyone could believe the crap which has spawned a multi-trillion dollar industry based on absolute garbage (see HIV causes AIDs and Sars-Cov-2 causes 'Covid-19'). Climate and 'Covid' have much in common given they have the same source. They both have the contradictory everything factor in which everything is explained by reference to them. It's hot – 'it's climate change'. It's cold – 'it's climate change'. I got a sniffle – 'it's Covid'. I haven't got a sniffle – 'it's Covid'. Not having a sniffle has to be a symptom of 'Covid'. Everything is and not having a sniffle is especially dangerous if you are a slow walker. For sheer audacity I offer you a Cambridge University 'study' that actually linked 'Covid' to 'climate change'. It had to happen eventually. They concluded that climate change played a role in 'Covid-19' spreading from animals to humans because ... wait for it ... I kid you not ... the two groups were forced closer together as populations grow. Er, that's it. The whole foundation on which this depended was that 'Bats are the likely zoonotic origin of SARS-CoV-1 and SARS-CoV-2'. Well, they are not. They are nothing to do with it. Apart from bats not being the origin and therefore 'climate change' effects on bats being irrelevant I am in awe of their academic insight. Where would we be without them? Not where we are that's for sure. Figure 9: The idea that the gas of life is disastrously changing the climate is an insult to brain One other point about the weather is that climate modification is now well advanced and not every major weather event is natural – or earthquake come to that. I cover this subject at some length in other books. China is openly planning a rapid expansion of its weather modification programme which includes changing the climate in an area more than one and a half times the size of India. China used weather manipulation to ensure clear skies during the 2008 Olympics in Beijing. I have quoted from US military documents detailing how to employ weather manipulation as a weapon of war and they did that in the 1960s and 70s during the conflict in Vietnam with Operation Popeye manipulating monsoon rains for military purposes. Why would there be international treaties on weather modification if it wasn't possible? Of course it is. Weather is energetic information and it can be changed. How was the climate hoax pulled off? See 'Covid' If you can get billions to believe in a 'virus' that doesn't exist you

can get them to believe in human-caused climate change that doesn't exist. Both are being used by the Cult to transform global society in the way it has long planned. Both hoaxes have been achieved in pretty much the same way. First you declare a lie is a fact. There's a 'virus' you call SARS-Cov-2 or humans are warming the planet with their behaviour. Next this becomes, via Cult networks, the foundation of government, academic and science policy and belief. Those who parrot the mantra are given big grants to produce research that confirms the narrative is true and ever more 'symptoms' are added to make the 'virus'/'climate change' sound even more scary. Scientists and researchers who challenge the narrative have their grants withdrawn and their careers destroyed. The media promote the lie as the unquestionable truth and censor those with an alternative view or evidence. A great percentage of the population believe what they are told as the lie becomes an everybody-knows-that and the believing-masses turn on those with a mind of their own. The technique has been used endlessly throughout human history. Workers are the biggest promoters of the climate lie and 'Covid' fascism because their minds are owned by the Cult; their sense of self-righteous self-purity knows no bounds; and they exist in a bubble of reality in which facts are irrelevant and only get in the way of looking without seeing. Running through all of this like veins in a blue cheese is control of information, which means control of perception, which means control of behaviour, which collectively means control of human society. The Cult owns the global media and Silicon Valley fascists for the simple reason that it has to. Without control of information it can't control perception and through that human society. Examine every facet of the Cult agenda and you will see that anything supporting its introduction is never censored while anything pushing back is always censored. I say again: Psychopaths that know that follow their orders must trot along behind them into the same dock. 'I was just following orders' didn't work the first time and it must not work now. Nuremberg trials must be held all over the world before public juries for politicians, government officials, police, compliant doctors, scientists and virologists, and all Cult operatives such as Gates, Tedros, Fauci, Vallance, Whitty, Ferguson, Zuckerberg, Wojcicki, Brin,

Page, Dorsey, the whole damn lot of them – including, no especially, the psychopath psychologists. Without them and the brainless, gutless excuses for journalists that have repeated their lies, none of this could be happening. Nobody can be allowed to escape justice for the psychological and economic Armageddon they are all responsible for visiting upon the human As for the compliant, unquestioning, swathes of humanity, and the self-obsessed, all-knowing ignorance of the Wokers ... don't start me. God help their kids. God help their grandkids. God help them. We must have it? So what is it? Well I won't back down. No, I won't back down. You can stand me up at the Gates of Hell. But I won't back down will now focus on the genetically-manipulating 'Covid vaccines' which do not meet this official definition of a vaccine by the US Centers for Disease Control (CDC): 'A product that stimulates a person's immune system to produce immunity to a specific disease, protecting the person from that disease.' On that basis 'Covid vaccines' are not a vaccine in that the makers don't even claim they stop infection or transmission. They are instead part of a multi-levelled conspiracy to change the nature of the human body and what it means to be 'human' and to depopulate an enormous swathe of humanity. What I shall call Human 1.0 is on the cusp of becoming Human 2.0 and for very sinister reasons. Before I get to the 'Covid vaccine' in detail here's some background to vaccines in general. Government regulators do not test vaccines – the makers do – and the makers control which data is revealed and which isn't. Children in America are given 50 vaccine doses by age six and 69 by age 19 and the effect of the whole combined schedule has never been tested. Autoimmune diseases when the immune system a^jacks its own body have soared in the mass vaccine era and so has disease in general in children and the young. Why wouldn't this be the case when vaccines target the immune system? The US government gave Big Pharma drug companies immunity from prosecution for vaccine death and injury in the 1986 National Childhood Vaccine Injury Act (NCVIA) and since then the government (taxpayer) has been funding compensation for the consequences of Big Pharma vaccines. The criminal and satanic drug giants can't lose and the vaccine schedule has increased dramatically since 1986 for this reason. There is no incentive to make vaccines safe

and a big incentive to make money by introducing ever more. Even against a ridiculously high bar to prove vaccine liability, and with the government controlling the hearing in which it is being challenged for compensation, the vaccine court has so far paid out more than \$4 billion. These are the vaccines we are told are safe and psychopaths like Zuckerberg censor posts saying otherwise. The immunity law was even justified by a ruling that vaccines by their nature were 'unavoidably unsafe'. Check out the ingredients of vaccines and you will be shocked if you are new to this. They put that in children's bodies?? What?? Try aluminium, a brain toxin connected to dementia, aborted foetal tissue and formaldehyde which is used to embalm corpses. World- renowned aluminium expert Christopher Exley had his research into the health effect of aluminium in vaccines shut down by Keele University in the UK when it began taking funding from the Bill and Melinda Gates Foundation. Research when diseases 'eradicated' by vaccines began to decline and you will find the fall began long before the vaccine was introduced. Sometimes the fall even plateaued after the vaccine. Diseases like scarlet fever for which there was no vaccine declined in the same way because of environmental and other factors. A perfect case in point is the polio vaccine. Polio began when lead arsenate was first sprayed as an insecticide and residues remained in food products. Spraying started in 1892 and the first US polio epidemic came in Vermont in 1894. The simple answer was to stop spraying, but Rockefeller-created Big Pharma had a better idea. Polio was decreed to be caused by the poliovirus which 'spreads from person to person and can infect a person's spinal cord'. Lead arsenate was replaced by the lethal DDT which had the same effect of causing paralysis by damaging the brain and central nervous system. Polio plummeted when DDT was reduced and then banned, but the vaccine is still given the credit for something it didn't do. Today by far the biggest cause of polio is the vaccines promoted by Bill Gates. Vaccine justice campaigner Robert Kennedy Jr, son of assassinated (by the Cult) US Attorney General Robert Kennedy, In 2017, the World Health Organization (WHO) reluctantly admitted that the global explosion in polio is predominantly vaccine strain. The most frightening epidemics in Congo, Afghanistan, and the Philippines, are all linked to vaccines. In

fact, by 2018, 70% of global polio cases were vaccine strain. Vaccines make fortunes for Cult-owned Gates and Big Pharma while undermining the health and immune systems of the population. We had a glimpse of the mentality behind the Big Pharma cartel with a report on WION (World is One News), an international English language TV station based in India, which exposed the extraordinary behaviour of US drug company Pfizer over its 'Covid vaccine'. The WION report told how Pfizer had made fantastic demands of Argentina, Brazil and other countries in return for its 'vaccine'. These included immunity from prosecution, even for Pfizer negligence, government insurance to protect Pfizer from law suits and handing over as collateral sovereign assets of the country to include Argentina's bank reserves, military bases and embassy buildings. Pfizer demanded the same of Brazil in the form of waiving sovereignty of its assets abroad; exempting Pfizer from Brazilian laws; and giving Pfizer immunity from all civil liability. This is a 'vaccine' developed with government funding. Big Pharma is evil incarnate as a creation of the Cult and all must be handed tickets to Nuremberg. Phantom 'vaccine' for a phantom 'disease' I'll expose the 'Covid vaccine' fraud and then go on to the wider background of why the Cult has set out to 'vaccinate' every man, woman and child on the planet for an alleged 'new disease' with a survival rate of 99.77 percent (or more) even by the grotesquely- manipulated figures of the World Health Organization and Johns Hopkins University. The 'infection' to 'death' ratio is 0.23 to 0.15 percent according to Stanford epidemiologist Dr John Ioannidis and while estimates vary the danger remains tiny. I say that if the truth be told the fake infection to fake death ratio is zero. Never mind all the evidence I have presented here and in The Answer that there is no 'virus' let us just focus for a moment on that death-rate figure of say 0.23 percent. The figure includes all those worldwide who have tested positive with a test not testing for the 'virus' and then died within 28 days or even longer of any other cause – any other cause. Now subtract all those illusory 'Covid' deaths on the global data sheets from the 0.23 percent. What do you think you would be left with? Zero. A vaccination has never been successfully developed for a so-called coronavirus. They have all failed at the animal testing stage when they caused hypersensitivity to what they were

claiming to protect against and made the impact of a disease far worse. Cult- owned vaccine corporations got around that problem this time by bypassing animal trials, going straight to humans and making the length of the 'trials' before the public rollout as short as they could get away with. Normally it takes five to ten years or more to develop vaccines that still cause demonstrable harm to many people and that's without including the long-term effects that are never officially connected to the vaccination. 'Covid' non-vaccines have been officially produced and approved in a matter of months from a standing start and part of the reason is that (a) they were developed before the 'Covid' hoax began and (b) they are based on computer programs and not natural sources. Official non-trials were so short that government agencies gave emergency, not full, approval. 'Trials' were not even completed and full approval cannot be secured until they are. Public 'Covid vaccination' is actually a continuation of the trial. Drug company 'trials' are not scheduled to end until 2023 by which time a lot of people are going to be dead. Data on which government agencies gave this emergency approval was supplied by the Big Pharma corporations themselves in the form of Pfizer/BioNTech, AstraZeneca, Moderna, Johnson & Johnson, and others, and this is the case with all vaccines. By its very nature emergency approval means drug companies do not have to prove that the 'vaccine' is 'safe and effective'. How could they with trials way short of complete? Government regulators only have to believe that they could be safe and effective. It is criminal manipulation to get products in circulation with no testing worth the name. Agencies giving that approval are infested with Big Pharma-connected people and they act in the interests of Big Pharma (the Cult) and not the public about whom they do not give a damn. More human lab rats 'Covid vaccines' produced in record time by Pfizer/BioNTech and Moderna employ a technique never approved before for use on humans. They are known as mRNA 'vaccines' and inject a synthetic version of 'viral' mRNA or 'messenger RNA'. The key is in the term 'messenger'. The body works, or doesn't, on the basis of information messaging. Communications are constantly passing between and within the genetic system and the brain. Change those messages and you change the state of the body and even its very nature and

you can change psychology and behaviour by the way the brain processes information. I think you are going to see significant changes in personality and perception of many people who have had the 'Covid vaccine' synthetic potions. Insider Aldous Huxley predicted the following in 1961 and mRNA 'vaccines' can be included in the term 'pharmacological methods': There will be, in the next generation or so, a pharmacological method of making people love their servitude, and producing dictatorship without tears, so to speak, producing a kind of painless concentration camp for entire societies, so that people will in fact have their own liberties taken away from them, but rather enjoy it, because they will be distracted from any desire to rebel by propaganda or brainwashing, or brainwashing enhanced by pharmacological methods. And this seems to be the final revolution. Apologists claim that mRNA synthetic 'vaccines' don't change the DNA genetic blueprint because RNA does not affect DNA only the other way round. This is so disingenuous. A process called 'reverse transcription' can convert RNA into DNA and be integrated into DNA in the cell nucleus. This was highlighted in December, 2020, by scientists at Harvard and Massachusetts Institute of Technology (MIT). Geneticists report that more than 40 percent of mammalian genomes results from reverse transcription. On the most basic level if messaging changes then that sequence must lead to changes in DNA which is receiving and transmitting those communications. How can introducing synthetic material into cells not change the cells where DNA is located? The process is known as transfection which is defined as 'a technique to insert foreign nucleic acid (DNA or RNA) into a cell, typically with the intention of altering the properties of the cell'. Researchers at the Sloan Kettering Institute in New York found that changes in messenger RNA can deactivate tumour-suppressing proteins and thereby promote cancer. This is what happens when you mess with messaging. 'Covid vaccine' maker Moderna was founded in 2010 by Canadian stem cell biologist Derrick J. Rossi after his breakthrough discovery in the field of transforming and reprogramming stem cells. These are neutral cells that can be programmed to become any cell including sperm cells. Moderna was therefore founded on the principle of genetic manipulation and has never produced any vaccine or drug before its

genetically-manipulating synthetic 'Covid' shite. Look at the name – Mode-RNA or Modify-RNA. Another important point is that the US Supreme Court has ruled that genetically-modified DNA, or complementary DNA (cDNA) synthesized in the laboratory from messenger RNA, can be patented and owned. These psychopaths are Cells replicate synthetic mRNA in the 'Covid vaccines' and in theory the body is tricked into making antigens which trigger antibodies to target the 'virus spike proteins' which as Dr Tom Cowan said have never been seen. Cut the crap and these 'vaccines' deliver self-replicating synthetic material to the cells with the effect of changing human DNA. The more of them you have the more that process is compounded while synthetic material is all the time self- replicating. 'Vaccine'-maker Moderna describes mRNA as 'like soĜware for the cell' and so they are messing with the body's soĜware. What happens when you change the soĜware in a computer? Everything changes. For this reason the Cult is preparing a production line of mRNA 'Covid vaccines' and a long list of excuses to use them as with all the 'variants' of a 'virus' never shown to exist. The plan is further to transfer the mRNA technique to other vaccines mostly given to children and young people. The cumulative consequences will be a transformation of human DNA through a constant infusion of synthetic genetic material which will kill many and change the rest. Now consider that governments that have given emergency approval for a vaccine that's not a vaccine; never been approved for humans before; had no testing worth the name; and the makers have been given immunity from prosecution for any deaths or adverse effects suffered by the public. The UK government awarded permanent legal indemnity to itself and its employees for harm done when a patient is being treated for 'Covid-19' or 'suspected Covid-19'. That is quite a thought when these are possible 'side-effects' from the 'vaccine' (they are not 'side', they are effects) listed by the US Food and Drug Administration: Guillain-Barre syndrome; acute disseminated encephalomyelitis; transverse myelitis; encephalitis; myelitis; encephalomyelitis; meningoencephalitis; meningitis; encephalopathy; convulsions; seizures; stroke; narcolepsy; cataplexy; anaphylaxis; acute myocardial infarction (heart aĴack); myocarditis; pericarditis; autoimmune disease; death; implications for pregnancy, and birth outcomes; other acute



demyelinating diseases; non anaphylactic allergy reactions; thrombocytopenia ; disseminated intravascular coagulation; venous thromboembolism; arthritis; arthralgia; joint pain; Kawasaki disease; multisystem inflammatory syndrome in children; vaccine enhanced disease. The latter is the way the 'vaccine' has the potential to make diseases far worse than they would otherwise be. UK doctor and freedom campaigner Vernon Coleman described the conditions in this list as 'all unpleasant, most of them very serious, and you can't get more serious than death'. The thought that anyone at all has had the 'vaccine' in these circumstances is testament to the potential that humanity has for clueless, unquestioning, stupidity and for many that programmed stupidity has already been terminal. An insider speaks Dr Michael Yeadon is a former Vice President, head of research and Chief Scientific Adviser at vaccine giant Pfizer. Yeadon worked on the inside of Big Pharma, but that did not stop him becoming a vocal critic of 'Covid vaccines' and their potential for multiple harms, including infertility in women. By the spring of 2021 he went much further and even used the no, no, term 'conspiracy'. When you begin to see what is going on it is impossible not to do so. Yeadon spoke out in an interview with freedom campaigner James Delingpole and I mentioned earlier how he said that no one had samples of 'the virus'. He explained that the mRNA technique originated in the anti- cancer field and ways to turn on and off certain genes which could be advantageous if you wanted to stop cancer growing out of control. 'That's the origin of them. They are a very unusual application, really.' Yeadon said that treating a cancer patient with an aggressive procedure might be understandable if the alternative was dying, but it was quite another thing to use the same technique as a public health measure. Most people involved wouldn't catch the infectious agent you were vaccinating against and if they did they probably wouldn't die: If you are really using it as a public health measure you really want to as close as you can get to zero sides-effects ... I find it odd that they chose techniques that were really cutting their teeth in the field of oncology and I'm worried that in using gene-based vaccines that have to be injected in the body and spread around the body, get taken up into some cells, and the regulators haven't quite told us which cells they get taken up into ... you are going to

be generating a wide range of responses ... with multiple steps each of which could go well or I doubt the Cult intends it to go well. Yeadon said that you can put any gene you like into the body through the 'vaccine'. 'You can certainly give them a gene that would do them some harm if you wanted.' I was intrigued when he said that when used in the cancer field the technique could turn genes on and off. I explore this process in The Answer and with different genes having different functions you could create mayhem – physically and psychologically – if you turned the wrong ones on and the right ones off. I read reports of an experiment by researchers at the University of Washington's school of computer science and engineering in which they encoded DNA to infect computers. The body is itself a biological computer and if human DNA can inflict damage on a computer why can't the computer via synthetic material mess with the human body? It can. The Washington research team said it was possible to insert malicious malware into 'physical DNA strands' and corrupt the computer system of a gene sequencing machine as it 'reads gene letters and stores them as binary digits 0 and 1'. They concluded that hackers could one day use blood or spit samples to access computer systems and obtain sensitive data from police forensics labs or infect genome files. It is at this level of digital interaction that synthetic 'vaccines' need to be seen to get the full picture and that will become very clear later on. Michael Yeadon said it made no sense to give the 'vaccine' to younger people who were in no danger from the 'virus'. What was the benefit? It was all downside with potential effects: The fact that my government in what I thought was a civilised, rational country, is raining [the 'vaccine'] on people in their 30s and 40s, even my children in their 20s, they're getting letters and phone calls, I know this is not right and any of you doctors who are vaccinating you know it's not right, too. They are not at risk. They are not at risk from the disease, so you are now hoping that the side-effects are so rare that you get away with it. You don't give new technology ... that you don't understand to 100 percent of the population. Blood clot problems with the AstraZeneca 'vaccine' have been affecting younger people to emphasise the downside risks with no benefit. AstraZeneca's version, produced with Oxford University, does not use mRNA, but still gets its toxic cocktail inside cells where it targets DNA.

The Johnson & Johnson 'vaccine' which uses a similar technique has also produced blood clot effects to such an extent that the United States paused its use at one point. They are all 'gene therapy' (cell modification) procedures and not 'vaccines'. The truth is that once the content of these injections enter cells we have no idea what the effect will be. People can speculate and some can give very educated opinions and that's good. In the end, though, only the makers know what their potions are designed to do and even they won't know every last consequence. Michael Yeadon was 'Everyone's mute', he said. Doctors in the NHS must know this was not right, coming into work and injecting people. 'I don't know how they sleep at night. I know I couldn't do it. I know that if I were in that position I'd have to quit.' He said he knew enough about toxicology to know this was not a good risk-benefit. Yeadon had spoken to seven or eight university professors and all except two would not speak out publicly. Their universities had a policy that no one said anything that countered the government and its medical advisors. They were afraid of losing their government grants. This is how intimidation has been used to silence the truth at every level of the system. I say silence, but these people could still speak out if they made that choice. Yeadon called them 'moral cowards' - 'This is about your children and grandchildren's lives and you have just buggered off and left it.' Some of his most powerful comments related to the alleged 'variants' being used to instil more fear, justify more lockdowns, and introduce more 'vaccines'. He said government claims about 'variants' were nonsense. He had checked the alleged variant 'codes' and they were 99.7 percent identical to the 'original'. This was the human identity difference equivalent to putting a baseball cap on and off or wearing it the other way round. A 0.3 percent difference would make it impossible for that 'variant' to escape immunity from the 'original'. This made no sense of having new 'vaccines' for 'variants'. He said there would have to be at least a 30 percent difference for that to be justified and even then he believed the immune system would still recognise what it was. Gates-funded 'variant modeller' and 'vaccine'-pusher John Edmunds might care to comment. Yeadon said drug companies were making new versions of the 'vaccine' as a 'top up' for 'variants'. Worse than that, he said, the 'regulators' around the world

like the MHRA in the UK had got together and agreed that because 'vaccines' for 'variants' were so similar to the first 'vaccines' they did not have to do safety studies. How transparently sinister that is. This is when Yeadon said: 'There is a conspiracy here.' There was no need for another vaccine for 'variants' and yet we were told that there was and the country had shut its borders because of them. 'They are going into hundreds of millions of arms without passing 'go' or any regulator. Why did they do that? Why did they pick this method of making the vaccine?' The reason had to be something bigger than that it seemed and 'it's not protection against the virus'. It's was a far bigger project that meant politicians and advisers were willing to do things and not do things that knowingly resulted in avoidable deaths – 'that's already happened when you think about lockdown and deprivation of health care for a year.' He spoke of people prepared to do something that results in the avoidable death of their fellow human beings and it not bother them. This is the penny-drop I have been working to get across for more than 30 years – the level of pure evil we are dealing with. Yeadon said his friends and associates could not believe there could be that much evil, but he reminded them of Stalin, Pol Pot and Hitler and of what Stalin had said: 'One death is a tragedy. A million? A statistic.' He could not think of a benign explanation for why you need top-up vaccines 'which I'm sure you don't' and for the regulators 'to just get out of the way and wave them through'. Why would the regulators do that when they were still wrestling with the dangers of the 'parent' vaccine? He was clearly shocked by what he had seen since the 'Covid' hoax began and now he was thinking the previously unthinkable: If you wanted to depopulate a significant proportion of the world and to do it in a way that doesn't involve destruction of the environment with nuclear weapons, poisoning everyone with anthrax or something like that, and you wanted plausible deniability while you had a multi-year infectious disease crisis, I actually don't think you could come up with a better plan of work than seems to be in front of me. I can't say that's what they are going to do, but I can't He said he never thought that they would get rid of 99 percent of humans, but now he wondered. 'If you wanted to that this would be a hell of a way to do it – it would be unstoppable folks.' Yeadon had concluded that those who submîed to

the 'vaccine' would be allowed to have some kind of normal life (but for how long?) while screws were tightened to coerce and mandate the last few percent. 'I think they'll put the rest of them in a prison camp. I wish I was wrong, but I don't think I am.' Other points he made included: There were no coronavirus vaccines then suddenly they all come along at the same time; we have no idea of the long term affect with trials so short; coercing or forcing people to have medical procedures is against the Nuremberg Code instigated when the Nazis did just that; people should at least delay having the 'vaccine'; a quick Internet search confirms that masks don't reduce respiratory viral transmission and 'the government knows that'; they have smashed civil society and they know that, too; two dozen peer-reviewed studies show no connection between lockdown and reducing deaths; he knew from personal friends the elite were still flying around and going on holiday while the public were locked down; the elite were not having the 'vaccines'. He was also asked if 'vaccines' could be made to target difference races. He said he didn't know, but the document by the Project for the New American Century in September, 2000, said developing 'advanced forms of biological warfare that can target specific genotypes may transform biological warfare from the realm of terror to a politically useful tool.' Oh, they're evil all right. Of that we can be absolutely sure. Another cull of old people We have seen from the CDC definition that the mRNA 'Covid vaccine' is not a vaccine and nor are the others that claim to reduce 'severity of symptoms' in some people, but not protect from infection or transmission. What about all the lies about returning to 'normal' if people were 'vaccinated'? If they are not claimed to stop infection and transmission of the alleged 'virus', how does anything change? This was all lies to manipulate people to take the jabs and we are seeing that now with masks and distancing still required for the 'vaccinated'. How did they think that elderly people with fragile health and immune responses were going to be affected by infusing their cells with synthetic material and other toxic substances? They knew that in the short and long term it would be devastating and fatal as the culling of the old that began with the first lockdowns was continued with the 'vaccine'. Death rates in care homes soared immediately residents began to be 'vaccinated' – infused with synthetic

material. Brave and committed whistleblower nurses put their careers at risk by exposing this truth while the rest kept their heads down and their mouths shut to put their careers before those they are supposed to care for. A long-time American Certified Nursing Assistant who gave his name as James posted a video in which he described emotionally what happened in his care home when vaccination began. He said that during 2020 very few residents were sick with 'Covid' and no one died during the entire year; but shortly after the Pfizer mRNA injections 14 people died within two weeks and many others were near death. 'They're dropping like flies', he said. Residents who walked on their own before the shot could no longer and they had lost their ability to conduct an intelligent conversation. The home's management said the sudden deaths were caused by a 'super-spreader' of 'Covid-19'. Then how come, James asked, that residents who refused to take the injections were not sick? It was a case of inject the elderly with mRNA synthetic potions and blame their illness and death that followed on the 'virus'. James described what was happening in care homes as 'the greatest crime of genocide this country has ever seen'. Remember the NHS staff nurse from earlier who used the same word 'genocide' for what was happening with the 'vaccines' and that it was an 'act of human annihilation'. A UK care home whistleblower told a similar story to James about the effect of the 'vaccine' in deaths and 'outbreaks' of illness dubbed 'Covid' after getting the jab. She told how her care home management and staff had zealously imposed government regulations and no one was allowed to even question the official narrative let alone speak out against it. She said the NHS was even worse. Again we see the results of reframing. A worker at a local care home where I live said they had not had a single case of 'Covid' there for almost a year and when the residents were 'vaccinated' they had 19 positive cases in two weeks with eight dying. It's not the 'vaccine' – honest The obvious cause and effect was being ignored by the media and most of the public. Australia's health minister Greg Hunt (a former head of strategy at the World Economic Forum) was admitted to hospital after he had the 'vaccine'. He was suffering according to reports from the skin infection 'cellulitis' and it must have been a severe case to have warranted days in hospital. Immediately the

authorities said this was nothing to do with the 'vaccine' when an effect of some vaccines is a 'cellulitis-like reaction'. We had families of perfectly healthy old people who died after the 'vaccine' saying that if only they had been given the 'vaccine' earlier they would still be alive. As a numbskull rating that is off the chart. A father of four 'died of Covid' at aged 48 when he was taken ill two days after having the 'vaccine'. The man, a health administrator, had been 'shielding during the pandemic' and had 'not really left the house' until he went for the 'vaccine'. Having the 'vaccine' and then falling ill and dying does not seem to have qualified as a possible cause and effect and 'Covid-19' went on his death certificate. His family said they had no idea how he 'caught the virus'. A family member said: 'Tragically, it could be that going for a vaccination ultimately led to him catching Covid ...The sad truth is that they are never going to know where it came from.' The family warned people to remember that the virus still existed and was 'very real'. So was their stupidity. Nurses and doctors who had the first round of the 'vaccine' were collapsing, dying and ending up in a hospital bed while they or their grieving relatives were saying they'd still have the 'vaccine' again despite what happened. I kid you not. You mean if your husband returned from the dead he'd have the same 'vaccine' again that killed Doctors at the VCU Medical Center in Richmond, Virginia, said the Johnson & Johnson 'vaccine' was to blame for a man's skin peeling off. Patient Richard Terrell said: 'It all just happened so fast. My skin peeled off. It's still coming off on my hands now.' He said it was stinging, burning and itching and when he bent his arms and legs it was very painful with 'the skin swollen and rubbing against itself'. Pfizer/BioNTech and Moderna vaccines use mRNA to change the cell while the Johnson & Johnson version uses DNA in a process similar to AstraZeneca's technique. Johnson & Johnson and AstraZeneca have both had their 'vaccines' paused by many countries after causing serious blood problems. Terrell's doctor Fnu Nutan said he could have died if he hadn't got medical attention. It sounds terrible so what did Nutan and Terrell say about the 'vaccine' now? Oh, they still recommend that people have it. A nurse in a hospital bed 40 minutes after the vaccination and unable to swallow due to throat swelling was told by a doctor that he lost mobility in his arm for 36 hours following the

vaccination. What did he say to the ailing nurse? 'Good for you for getting the vaccination.' We are dealing with a serious form of cognitive dissonance madness in both public and medical staff. There is a remarkable correlation between those having the 'vaccine' and trumpeting the fact and suffering bad happenings shortly afterwards. Witold Rogiewicz, a Polish doctor, made a video of his 'vaccination' and ridiculed those who were questioning its safety and the intentions of Bill Gates: 'Vaccinate yourself to protect yourself, your loved ones, friends and also patients. And to mention quickly I have info for anti-vaxxers and anti-Covid-ers if you want to contact Bill Gates you can do this through me.' He further ridiculed the dangers of 5G. Days later he was dead, but naturally the vaccination wasn't mentioned in the verdict of 'heart attack'. Lies, lies and more lies So many members of the human race have slipped into extreme states of insanity and unfortunately they include reframed doctors and nursing staff. Having a 'vaccine' and dying within minutes or hours is not considered a valid connection while death from any cause within 28 days or longer of a positive test with a test not testing for the 'virus' means 'Covid-19' goes on the death certificate. How could that 'vaccine'-death connection not have been made except by calculated deceit? US figures in the initial rollout period to February 12th, 2020, revealed that a third of the deaths reported to the CDC after 'Covid vaccines' happened within 48 hours. Five men in the UK suffered an 'extremely rare' blood clot problem after having the AstraZeneca 'vaccine', but no causal link was established said the Gates-funded Medicines and Healthcare products Regulatory Agency (MHRA) which had given the 'vaccine' emergency approval to be used. Former Pfizer executive Dr Michael Yeadon explained in his interview how the procedures could cause blood coagulation and clots. People who should have been at no risk were dying from blood clots in the brain and he said he had heard from medical doctor friends that people were suffering from skin bleeding and massive headaches. The AstraZeneca 'shot' was stopped by some 20 countries over the blood clotting issue and still the corrupt MHRA, the European Medicines Agency (EMA) and the World Health Organization said that it should continue to be given even though the EMA admitted that it 'still cannot rule out definitively' a link between blood clotting and the 'vaccine'. Later



Marco Cavaleri, head of EMA vaccine strategy, said there was indeed a clear link between the 'vaccine' and thrombosis, but they didn't know why. So much for the trials showing the 'vaccine' is safe. Blood clots were affecting younger people who would be under virtually no danger from 'Covid' even if it existed which makes it all the more stupid and sinister. The British government responded to public alarm by wheeling out June Raine, the terrifyingly weak infant school headmistress sound-alike who heads the UK MHRA drug 'regulator'. The idea that she would stand up to Big Pharma and government pressure is laughable and she told us that all was well in the same way that she did when allowing untested, never-used-on-humans-before, genetically-manipulating 'vaccines' to be exposed to the public in the first place. Mass lying is the new normal of the 'Covid' era. The MHRA later said 30 cases of rare blood clots had by then been connected with the AstraZeneca 'vaccine' (that means a lot more in reality) while stressing that the benefits of the jab in preventing 'Covid-19' outweighed any risks. A more ridiculous and disingenuous statement with callous disregard for human health it is hard to contemplate. Immediately after the mendacious 'all-clears' two hospital workers in Denmark experienced blood clots and cerebral haemorrhaging following the AstraZeneca jab and one died. Top Norwegian health official Pål Andre Holme said the 'vaccine' was the only common factor: 'There is nothing in the patient history of these individuals that can give such a powerful immune response ... I am confident that the antibodies that we have found are the cause, and I see no other explanation than it being the vaccine which triggers it.' Strokes, a clot or bleed in the brain, were clearly associated with the 'vaccine' from word of mouth and whistleblower reports. Similar consequences followed with all these 'vaccines' that we were told were so safe and as the numbers grew by the day it was clear we were witnessing human carnage. Learning the hard way A woman interviewed by UKColumn told how her husband suffered dramatic health effects after the vaccine when he'd been in good health all his life. He went from being a little unwell to losing all feeling in his legs and experiencing 'excruciating pain'. Misdiagnosis followed twice at Accident and Emergency (an 'allergy' and 'sciatica') before he was admitted to a neurology ward where doctors said his

serious condition had been caused by the 'vaccine'. Another seven 'vaccinated' people were apparently being treated on the same ward for similar symptoms. The woman said he had the 'vaccine' because they believed media claims that it was safe. 'I didn't think the government would give out a vaccine that does this to somebody; I believed they would be bringing out a vaccination that would be safe.' What a tragic way to learn that lesson. Another woman posted that her husband was transporting stroke patients to hospital on almost every shift and when he asked them if they had been 'vaccinated' for 'Covid' they all replied 'yes'. One had a 'massive brain bleed' the day after his second dose. She said her husband reported the 'just been vaccinated' information every time to doctors in A and E only for them to ignore it, make no notes and appear annoyed that it was even mentioned. This particular report cannot be verified, but it expresses a common theme that confirms the monumental underreporting of 'vaccine' consequences. Interestingly as the 'vaccines' and their brain blood clot/stroke consequences began to emerge the UK National Health Service began a publicity campaign telling the public what to do in the event of a stroke. A Scottish NHS staff nurse who quit in disgust in March, 2021, said: I have seen traumatic injuries from the vaccine, they're not getting reported to the yellow card [adverse reaction] scheme, they're treating the symptoms, not asking why, why it's happening. It's just treating the symptoms and when you speak about it you're dismissed like you're crazy, I'm not crazy, I'm not crazy because every other colleague I've spoken to is terrified to speak out, they've had enough. Videos appeared on the Internet of people uncontrollably shaking after the 'vaccine' with no control over muscles, limbs and even their face. A Scottish mother broke out in a severe rash all over her body almost immediately after she was given the AstraZeneca 'vaccine'. The pictures were horrific. Leigh King, a 41-year-old hairdresser from Lanarkshire said: 'Never in my life was I prepared for what I was about to experience ... My skin was so sore and constantly hot ... I have never felt pain like this ...' But don't you worry, the 'vaccine' is perfectly safe. Then there has been the effect on medical staff who have been pressured to have the 'vaccine' by psychopathic 'health' authorities and government. A London hospital consultant who gave the name K. Polyakova

wrote this to the British Medical Journal or BMJ: I am currently struggling with ... the failure to report the reality of the morbidity caused by our current vaccination program within the health service and staff population. The levels of sickness after vaccination is unprecedented and staff are getting very sick and some with neurological symptoms which is having a huge impact on the health service function. Even the young and healthy are off for days, some for weeks, and some requiring medical treatment. Whole teams are being taken out as they went to get vaccinated together. Mandatory vaccination in this instance is stupid, unethical and irresponsible when it comes to protecting our staff and public health. We are in the voluntary phase of vaccination, and encouraging staff to take an unlicensed product that is impacting on their immediate health ... it is clearly stated that these vaccine products do not offer immunity or stop transmission. In Not to protect health that's for sure. Medical workers are lauded by governments for agenda reasons when they couldn't give a toss about them any more than they can for the population in general. Schools across America faced the same situation as they closed due to the high number of teachers and other staff with bad reactions to the Pfizer/BioNTech, Moderna, and Johnson & Johnson 'Covid vaccines' all of which were linked to death and serious adverse effects. The BMJ took down the consultant's comments pretty quickly on the grounds that they were being used to spread 'disinformation'. They were exposing the truth about the 'vaccine' was the real reason. The cover-up is breathtaking. Hiding the evidence The scale of the 'vaccine' death cover-up worldwide can be confirmed by comparing official figures with the personal experience of the public. I heard of many people in my community who died immediately or soon after the vaccine that would never appear in the media or even likely on the official totals of 'vaccine' fatalities and adverse reactions when only about ten percent are estimated to be reported and I have seen some estimates as low as one percent in a Harvard study. In the UK alone by April 29th, 2021, some 757,654 adverse reactions had been officially reported from the Pfizer/BioNTech, Oxford/AstraZeneca and Moderna 'vaccines' with more than a thousand deaths linked to jabs and that means an estimated ten times this number in reality from a ten percent reporting rate percentage.

That's seven million adverse reactions and 10,000 potential deaths and a one percent reporting rate would be ten times those figures. In 1976 the US government pulled the swine flu vaccine after 53 deaths. The UK data included a combined 10,000 eye disorders from the 'Covid vaccines' with more than 750 suffering visual impairment or blindness and again multiply by the estimated reporting percentages. As 'Covid cases' officially fell hospitals virtually empty during the 'Covid crisis' began to fill up with a range of other problems in the wake of the 'vaccine' rollout. The numbers across America have also been catastrophic. Deaths linked to all types of vaccine increased by 6,000 percent in the first quarter of 2021 compared with 2020. A 39-year-old woman from Ogden, Utah, died four days after receiving a second dose of Moderna's 'Covid vaccine' when her liver, heart and kidneys all failed despite the fact that she had no known medical issues or conditions. Her family sought an autopsy, but Dr Erik Christensen, Utah's chief medical examiner, said proving vaccine injury as a cause of death almost never happened. He could think of only one instance where an autopsy would name a vaccine as the official cause of death and that would be anaphylaxis where someone received a vaccine and died almost instantaneously. 'Short of that, it would be difficult for us to definitively say this is the vaccine,' Christensen said. If that is true this must be added to the estimated ten percent (or far less) reporting rate of vaccine deaths and serious reactions and the conclusion can only be that vaccine deaths and serious reactions – including these 'Covid' potions' – are phenomenally understated in official figures. The same story can be found everywhere. Endless accounts of deaths and serious reactions among the public, medical and care home staff while official figures did not even begin to. Professional script-reader Dr David Williams, a 'top public-health official' in Ontario, Canada, insulted our intelligence by claiming only four serious adverse reactions and no deaths from the more than 380,000 vaccine doses then given. This bore no resemblance to what people knew had happened in their own circles and we had Dirk Huyer in charge of getting millions vaccinated in Ontario while at the same time he was Chief Coroner for the province investigating causes of death including possible death from the vaccine. An aide said he had stepped back from investigating deaths, but

evidence indicated otherwise. Rosemary Frei, who secured a Master of Science degree in molecular biology at the Faculty of Medicine at Canada's University of Calgary before turning to investigative journalism, was one who could see that official figures for 'vaccine' deaths and reactions made no sense. She said that doctors seldom reported adverse events and when people got really sick or died after getting a vaccination they would attribute that to anything except the vaccines. It had been that way for years and anyone who wondered aloud whether the 'Covid vaccines' or other shots cause harm is immediately branded as 'anti-vax' and 'anti-science'. This was 'career-threatening' for health professionals. Then there was the huge pressure to support the push to 'vaccinate' billions in the quickest time possible. Frei said: So that's where we're at today. More than half a million vaccine doses have been given to people in Ontario alone. The rush is on to vaccinate all 15 million of us in the province by September. And the mainstream media are screaming for this to be sped up even more. That all adds up to only a very slim likelihood that we're going to be told the truth by officials about how many people are getting sick or dying from the vaccines. What is true of Ontario is true of everywhere. They KNEW – and still did it The authorities knew what was going to happen with multiple deaths and adverse reactions. The UK government's Gates-funded and Big Pharma-dominated Medicines and Healthcare products Regulatory Agency (MHRA) hired a company to employ AI in compiling the projected reactions to the 'vaccine' that would otherwise be uncountable. The request for applications said: 'The MHRA urgently seeks an Artificial Intelligence (AI) software tool to process the expected high volume of Covid-19 vaccine Adverse Drug Reaction ...' This was from the agency, headed by the disingenuous June Raine, that gave the 'vaccines' emergency approval and the company was hired before the first shot was given. 'We are going to kill and maim you – is that okay?' 'Oh, yes, perfectly fine – I'm very grateful, thank you, doctor.' The range of 'Covid vaccine' adverse reactions goes on for page after page in the MHRA criminally underreported 'Yellow Card' system and includes affects to eyes, ears, skin, digestion, blood and so on. Raine's MHRA amazingly claimed that the 'overall safety experience ... is so far as expected from the clinical trials'. The death, serious

adverse effects, deafness and blindness were expected? When did they ever mention that? If these human tragedies were expected then those that gave approval for the use of these 'vaccines' must be guilty of crimes against humanity including murder – a definition of which is 'killing a person with malice aforethought or with recklessness manifesting extreme indifference to the value of human life.' People involved at the MHRA, the CDC in America and their equivalent around the world must go before Nuremberg trials to answer for their callous inhumanity. We are only talking here about the immediate effects of the 'vaccine'. The longer-term impact of the DNA synthetic manipulation is the main reason they are so hysterically desperate to inoculate the entire global population in the shortest possible time. Africa and the developing world are a major focus for the 'vaccine' depopulation agenda and a mass vaccination sales-pitch is underway thanks to caring people like the Rockefellers and other Cult assets. The Rockefeller Foundation, which pre-empted the 'Covid pandemic' in a document published in 2010 that 'predicted' what happened a decade later, announced an initial \$34.95 million grant in February, 2021, 'to ensure more equitable access to Covid-19 testing and vaccines' among other things in Africa in collaboration with '24 organizations, businesses, and government agencies'. The pan-Africa initiative would focus on 10 countries: Burkina Faso, Ethiopia, Ghana, Kenya, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Zambia'. Rajiv Shah, President of the Rockefeller Foundation and former administrator of CIA-controlled USAID, said that if Africa was not mass-vaccinated (to change the DNA of its people) it was a 'threat to all of humanity' and not fair on Africans. When someone from the Rockefeller Foundation says they want to do something to help poor and deprived people and countries it is their 'heart' because 'vaccinating' the entire global population is what the 'Covid' hoax set out to achieve. Official 'decolonisation' of Africa by the Cult was merely a prelude to financial colonisation on the road to a return to physical colonisation. The 'vaccine' is vital to that and the sudden and convenient death of the 'Covid' sceptic president of Tanzania can be seen in its true light. A lot of people in Africa are aware that this is another form of colonisation and exploitation and they need to stand their ground. The 'vaccine is working'

scam A potential problem for the Cult was that the 'vaccine' is meant to change human DNA and body messaging and not to protect anyone from a 'virus' never shown to exist. The vaccine couldn't work because it was not designed to work and how could they make it appear to be working so that more people would have it? This was overcome by lowering the amplification rate of the PCR test to produce fewer 'cases' and therefore fewer 'deaths'. Some of us had been pointing out since March, 2020, that the amplification rate of the test not testing for the 'virus' had been made artificially high to generate positive tests which they could call 'cases' to justify lockdowns. The World Health Organization recommended an absurdly high 45 amplification cycles to ensure the high positives required by the Cult and then remained silent on the issue until January 20th, 2021 – Biden's Inauguration Day. This was when the 'vaccinations' were seriously underway and on that day the WHO recommended after discussions with America's CDC that laboratories lowered their testing amplification. Dr David Samadi, a certified urologist and health writer, said the WHO was encouraging all labs to reduce their cycle count for PCR tests. He said the current cycle was much too high and was 'resulting in any particle being declared a positive case'. Even one mainstream news report I saw said this meant the number of 'Covid' infections may have been 'dramatically inflated'. Oh, just a little bit. The CDC in America issued new guidance to laboratories in April, 2021, to use 28 cycles but only for 'vaccinated' people. The timing of the CDC/WHO interventions were cynically designed to make it appear the 'vaccines' were responsible for falling cases and deaths when the real reason can be seen in the following examples. New York's state lab, the Wadsworth Center, identified 872 positive tests in July, 2020, based on a threshold of 40 cycles. When the figure was lowered to 35 cycles 43 percent of the 872 were no longer 'positives'. At 30 cycles the figure was 63 percent. A Massachusetts lab found that between 85 to 90 percent of people who tested positive in July with a cycle threshold of 40 would be negative at 30 cycles, Ashish Jha, MD, director of the Harvard Global Health Institute, said: 'I'm really shocked that it could be that high ... Boy, does it really change the way we need to be thinking about testing.' I'm shocked that I could see the obvious in the spring of 2020, with no medical

background, and most medical professionals still haven't worked it out. No, that's not shocking – it's terrifying. Three weeks after the WHO directive to lower PCR cycles the London Daily Mail ran this headline: 'Why ARE Covid cases plummeting? New infections have fallen 45% in the US and 30% globally in the past 3 weeks but experts say vaccine is NOT the main driver because only 8% of Americans and 13% of people worldwide have received their first dose.' They acknowledged that the drop could not be attributed to the 'vaccine', but soon this morphed throughout the media into the 'vaccine' has caused cases and deaths to fall when it was the PCR threshold. In December, 2020, there was chaos at English Channel ports with truck drivers needing negative 'Covid' tests before they could board a ferry home for Christmas. The government wanted to remove the backlog as fast as possible and they brought in troops to do the 'testing'. Out of 1,600 drivers just 36 tested positive and the rest were given the all clear to cross the Channel. I guess the authorities thought that 36 was the least they could get away with without the unquestioning catching on. The amplification trick which most people believed in the absence of information in the mainstream applied more pressure on those refusing the 'vaccine' to succumb when it 'obviously worked'. The truth was the exact opposite with deaths in care homes soaring with the 'vaccine' and in Israel the term used was 'skyrocket'. A re-analysis of published data from the Israeli Health Ministry led by Dr Hervé Seligmann at the Medicine Emerging Infectious and Tropical Diseases at Aix-Marseille University found that Pfizer's 'Covid vaccine' killed 'about 40 times more [elderly] people than the disease itself would have killed' during a five-week vaccination period and 260 times more younger people than would have died from the 'virus' even according to the manipulated 'virus' figures. Dr Seligmann and his co-study author, Haim Yativ, declared after reviewing the Israeli 'vaccine' death data: 'This is a new Holocaust.' Then, in mid-April, 2021, after vast numbers of people worldwide had been 'vaccinated', the story changed with clear coordination. The UK government began to prepare the ground for more future lockdowns when Nuremberg-destined Boris Johnson told yet another whopper. He said that cases had fallen because of lockdowns not 'vaccines'. Lockdowns are irrelevant when there is no 'virus'



and the test and fraudulent death certificates are deciding the number of 'cases' and 'deaths'. Study after study has shown that lockdowns don't work and instead kill and psychologically destroy people. Meanwhile in the United States Anthony Fauci and Rochelle Walensky, the ultra-Zionist head of the CDC, peddled the same line. More lockdown was the answer and not the 'vaccine', a line repeated on cue by the moron that is Canadian Prime Minister Justin Trudeau. Why all the hysteria to get everyone 'vaccinated' if lockdowns and not 'vaccines' made the difference? None of it makes sense on the face of it. Oh, but it does. The Cult wants lockdowns and the 'vaccine' and if the 'vaccine' is allowed to be seen as the total answer lockdowns would no longer be justified when there are still livelihoods to destroy. 'Variants' and renewed upward manipulation of PCR amplification are planned to instigate never-ending lockdown and more 'vaccines'. You must have it – we're desperate Israel, where the Jewish and Arab population are ruled by the Sabbatian Cult, was the front-runner in imposing the DNA-manipulating 'vaccine' on its people to such an extent that Jewish refusers began to liken what was happening to the early years of Nazi Germany. This would seem to be a fantastic claim. Why would a government of Jewish people be acting like the Nazis did? If you realise that the Sabbatian Cult was behind the Nazis and that Sabbatians hate Jews the pieces start to fit and the question of why a 'Jewish' government would treat Jews with such callous disregard for their lives and freedom finds an answer. Those controlling the government of Israel aren't Jewish – they're Sabbatian. Israeli lawyer Tamir Turgal was one who made the Nazi comparison in comments to German lawyer Reiner Fuellmich who is leading a class action lawsuit against the psychopaths for crimes against humanity. Turgal described how the Israeli government was vaccinating children and pregnant women on the basis that there was no evidence that this was dangerous when they had no evidence that it wasn't dangerous either. They just had no evidence. This was medical experimentation and Turgal said this breached the Nuremberg Code about medical experimentation and procedures requiring informed consent and choice. Think about that. A Nuremberg Code developed because of Nazi experimentation on Jews and others in concentration camps by people like the

evil-beyond-belief Josef Mengele is being breached by the Israeli government; but when you know that it's a Sabbatian government along with its intelligence and military agencies like Mossad, Shin Bet and the Israeli Defense Forces, and that Sabbatians were the force behind the Nazis, the kaleidoscope comes into focus. What have we come to when Israeli Jews are suing their government for violating the Nuremberg Code by essentially making Israelis subject to a medical experiment using the controversial 'vaccines'? It's a shocker that this has to be done in the light of what happened in Nazi Germany. The Anshe Ha-Emet, or 'People of the Truth', made up of Israeli doctors, lawyers, campaigners and public, have launched a lawsuit with the International Criminal Court. It says: When the heads of the Ministry of Health as well as the prime minister presented the vaccine in Israel and began the vaccination of Israeli residents, the vaccinated were not advised, that, in practice, they are taking part in a medical experiment and that their consent is required for this under the Nuremberg Code. The irony is unbelievable, but easily explained in one word: Sabbatians. The foundation of Israeli 'Covid' apartheid is the 'green pass' or 'green passport' which allows Jews and Arabs who have had the DNA-manipulating 'vaccine' to go about their lives – to work, fly, travel in general, go to shopping malls, bars, restaurants, hotels, concerts, gyms, swimming pools, theatres and sports venues, while non-'vaccinated' are banned from all those places and activities. Israelis have likened the 'green pass' to the yellow stars that Jews in Nazi Germany were forced to wear – the same as the yellow stickers that a branch of UK supermarket chain Morrisons told exempt mask-wearers they had to display when shopping. How very sensitive. The Israeli system is blatant South African-style apartheid on the basis of compliance or non-compliance to fascism rather than colour of the skin. How appropriate that the Sabbatian Israeli government was so close to the pre-Mandela apartheid regime in Pretoria. The Sabbatian-instigated 'vaccine passport' in Israel is planned for everywhere. Sabbatians struck a deal with Pfizer that allowed them to lead the way in the percentage of a national population infused with synthetic material and the result was catastrophic. Israeli freedom activist Shai Dannon told me how chairs were appearing on beaches that said 'vaccinated only'. Health

Minister Yuli Edelstein said that anyone unwilling or unable to get the jabs that 'confer immunity' will be 'left behind'. The man's a liar. Not even the makers claim the 'vaccines' confer immunity. When you see those figures of 'vaccine' deaths these psychopaths were saying that you must take the chance the 'vaccine' will kill you or maim you while knowing it will change your DNA or lockdown for you will be permanent. That's fascism. The Israeli parliament passed a law to allow personal information of the non-vaccinated to be shared with local and national authorities for three months. This was claimed by its supporters to be a way to 'encourage' people to be vaccinated. Hadas Ziv from Physicians for Human Rights described this as a 'draconian law which crushed medical ethics and the patient rights'. But that's the idea, the Sabbatians would reply. Your papers, please Sabbatian Israel was leading what has been planned all along to be a global 'vaccine pass' called a 'green passport' without which you would remain in permanent lockdown restriction and unable to do anything. This is how badly – desperately – the Cult is to get everyone 'vaccinated'. The term and colour 'green' was not by chance and related to the psychology of fusing the perception of the green climate hoax with the 'Covid' hoax and how the 'solution' to both is the same Great Reset. Lying politicians, health officials and psychologists denied there were any plans for mandatory vaccinations or restrictions based on vaccinations, but they knew that was exactly what was meant to happen with governments of all countries reaching agreements to enforce a global system. 'Free' Denmark and 'free' Sweden unveiled digital vaccine certification. Cyprus, Czech Republic, Estonia, Greece, Hungary, Iceland, Italy, Poland, Portugal, Slovakia, and Spain have all committed to a vaccine passport system and the rest including the whole of the EU would follow. The satanic UK government will certainly go this way despite mendacious denials and at the time of writing it is trying to manipulate the public into having the 'vaccine' so they could go abroad on a summer holiday. How would that work without something to prove you had the synthetic toxicity injected into you? Documents show that the EU's European Commission was moving towards 'vaccine certificates' in 2018 and 2019 before the 'Covid' hoax began. They knew what was coming. Abracadabra – Ursula von der Leyen, the German

President of the Commission, announced in March, 2021, an EU 'Digital Green Certificate' – green again – to track the public's 'Covid status'. The passport sting is worldwide and the Far East followed the same pattern with South Korea ruling that only those with 'vaccination' passports – again the green pass – would be able to 'return to their daily lives'. Bill Gates has been preparing for this 'passport' with other Cult operatives for years and beyond the paper version is a Gates-funded 'digital tattoo' to identify who has been vaccinated and who hasn't. The 'tattoo' is reported to include a substance which is externally readable to confirm who has been vaccinated. This is a bio-luminous light-generating enzyme (think fireflies) called ... Luciferase. Yes, named after the Cult 'god' Lucifer the 'light bringer' of whom more to come. Gates said he funded the readable tattoo to ensure children in the developing world were vaccinated and no one was missed out. He cares so much about poor kids as we know. This was just the cover story to develop a vaccine tagging system for everyone on the planet. Gates has been funding the ID2020 'alliance' to do just that in league with other lovely people at Microsoft, GAVI, the Rockefeller Foundation, Accenture and IDEO.org. He said in interviews in March, 2020, before any 'vaccine' publicly existed, that the world must have a globalised digital certificate to track the 'virus' and who had been vaccinated. Gates knew from the start that the mRNA vaccines were coming and when they would come and that the plan was to tag the 'vaccinated' to marginalise the intelligent and stop was exposed for offering a \$10 million bribe to the Nigerian House of Representatives to invoke compulsory 'Covid' vaccination of all Nigerians. Sara Cunial, a member of the Italian Parliament, called Gates a 'vaccine criminal'. She urged the Italian President to hand him over to the International Criminal Court for crimes against humanity and condemned his plans to 'chip the human race' You know it's a long-planned agenda when war criminal and Cult gofer Tony Blair is on the case. With the scale of arrogance only someone as dark as Blair can muster he said: 'Vaccination in the end is going to be your route to liberty.' Blair is a disgusting piece of work and he confirms that again. The media has given a lot of coverage to a bloke called Charlie Mullins, founder of London's biggest independent plumbing company, Pimlico Plumbers, who has said he won't

employ anyone who has not been vaccinated or have them go to any home where people are not vaccinated. He said that if he had his way no one would be allowed to walk the streets if they have not been vaccinated. Gates was cheering at the time while I was alerting the white coats. The plan is that people will qualify for 'passports' for having the first two doses and then to keep it they will have to have all the follow ups and new ones for invented 'variants' until human genetics is transformed and many are dead who can't adjust to the changes. Hollywood celebrities – the usual propaganda stunt – are promoting something called the WELL Health-Safety Rating to verify that a building or space has 'taken the necessary steps to prioritize the health and safety of their staff, visitors and other stakeholders'. They included Lady Gaga, Jennifer Lopez, Michael B. Jordan, Robert DeNiro, Venus Williams, Wolfgang Puck, Deepak Chopra and 17th Surgeon General Richard Carmona. Yawn. WELL Health-Safety has big connections with China. Parent company Delos is headed by former Goldman Sachs partner Paul Scialla. This is another example – and we will see so many others – of using the excuse of 'health' to dictate the lives and activities of the population. I guess one confirmation of the 'safety' of buildings is that only 'vaccinated' people can go in, right? Electronic concentration camps I wrote decades ago about the plans to restrict travel and here we are for those who refuse to bow to tyranny. This can be achieved in one go with air travel if the aviation industry makes a blanket decree. The 'vaccine' and guaranteed income are designed to be part of a global version of China's social credit system which tracks behaviour 24/7 and awards or deletes 'credits' based on whether your behaviour is supported by the state or not. I mean your entire lifestyle – what you do, eat, say, everything. Once your credit score falls below a certain level consequences kick in. In China tens of millions have been denied travel by air and train because of this. All the locations and activities denied to refusers by the 'vaccine' anything for those that don't bow their head to government. It's beyond fascist and a new term is required to describe its extremes – I guess fascist technocracy will have to do. The way the Chinese system of technological – technocratic – control is sweeping the West can be seen in the Los Angeles school system and is planned to be expanded worldwide. Every child

is required to have a 'Covid'- tracking app scanned daily before they can enter the classroom. The so-called Daily Pass tracking system is produced by Gates' Microsoft which I'm sure will shock you rigid. The pass will be scanned using a barcode (one step from an inside-the-body barcode) and the information will include health checks, 'Covid' tests and vaccinations. Entry codes are for one specific building only and access will only be allowed if a student or teacher has a negative test with a test not testing for the 'virus', has no symptoms of anything alleged to be related to 'Covid' (symptoms from a range of other illness), and has a temperature under 100 degrees. No barcode, no entry, is planned to be the case for everywhere and not only schools. Kids are being psychologically prepared to accept this as 'normal' their whole life which is why what they can impose in schools is so important to the Cult and its gofers. Long-time American freedom campaigner John Whitehead of the Rutherford Institute was not exaggerating when he said: 'Databit by databit, we are building our own electronic concentration camps.' Canada under its Cult gofer prime minister Justin Trudeau has taken a major step towards the real thing with people interned against their will if they test positive with a test not testing for the 'virus' when they arrive at a Canadian airport. They are jailed in internment hotels often without food or water for long periods and with many doors failing to lock there have been sexual assaults. The interned are being charged sometimes \$2,000 for the privilege of being abused in this way. Trudeau is fully on board with the Cult and says the 'Covid pandemic' has provided an opportunity for a global 'reset' to permanently change Western civilisation. His number two, Deputy Prime Minister Chrystia Freeland, is a trustee of the World Economic Forum and a Rhodes Scholar. The Trudeau family have long been servants of the Cult. See The Biggest Secret and Cathy O'Brien's book Trance-Formation of America for the horrific background to Trudeau's father Pierre Trudeau another Canadian prime minister. Hide your fascism behind the façade of a heart-on-the-sleeve liberal. It's a well-honed Cult technique. What can the 'vaccine' really do? We have a 'virus' never shown to exist and 'variants' of the 'virus' that have also never been shown to exist except, like the 'original', as computer-generated fictions. Even if you believe there's a 'virus' the 'case' to 'death' rate is

in the region of 0.23 to 0.15 percent and those 'deaths' are concentrated among the very old around the same average age that people die anyway. In response to this lack of threat (in truth none) psychopaths and idiots, knowingly and unknowingly answering to Gates and the Cult, are seeking to 'vaccinate' every man, woman and child on Planet Earth. Clearly the 'vaccine' is not about 'Covid' – none of this ever has been. So what is it all about really? Why the desperation to infuse genetically-manipulating synthetic material into everyone through mRNA fraudulent excuses of 'variants' and other 'virus' inventions? Dr Sherri Tenpenny, an osteopathic medical doctor in the United States, has made herself an expert on vaccines and their effects as a vehement campaigner against their use. Tenpenny was board certified in emergency medicine, the director of a level two trauma centre for 12 years, and moved to Cleveland in 1996 to start an integrative medicine practice which has treated patients from all 50 states and some 17 other countries. Weaning people off pharmaceutical drugs is She became interested in the consequences of vaccines after attending a meeting at the National Vaccine Information Center in Washington DC in 2000 where she 'sat through four days of listening to medical doctors and scientists and lawyers and parents of vaccine injured kids' and asked: 'What's going on?' She had never been vaccinated and never got ill while her father was given a list of vaccines to be in the military and was 'sick his entire life'. The experience added to her questions and she began to examine vaccine documents from the Centers for Disease Control (CDC). After reading the first one, the 1998 version of The General Recommendations of Vaccination, she thought: 'This is it?' The document was poorly written and bad science and Tenpenny began 20 years of research into vaccines that continues to this day. She began her research into 'Covid vaccines' in March, 2020, and she describes them as 'deadly'. For many, as we have seen, they already have been. Tenpenny said that in the first 30 days of the 'vaccine' rollout in the United States there had been more than 40,000 adverse events reported to the vaccine adverse event database. A document had been delivered to her the day before that was 172 pages long. 'We have over 40,000 adverse events; we have over 3,100 cases of [potentially deadly] anaphylactic shock; we have over 5,000 neurological reactions.' Effects

ranged from headaches to numbness, dizziness and vertigo, to losing feeling in hands or feet and paraesthesia which is when limbs 'fall asleep' and people have the sensation of insects crawling underneath their skin. All this happened in the first 30 days and remember that only about ten percent (or far less) of adverse reactions and vaccine-related deaths are estimated to be officially reported. So can you think of one single product in any industry, any industry, for as long as products have been made on the planet that within 30 days we have 40,000 people complaining of side effects that not only is still on the market but ... we've got paid actors telling us how great they are for getting their vaccine. We're offering people \$500 if they will just get their vaccine and we've got nurses and doctors going; 'I got the vaccine, I got the vaccine'. Tenpenny said they were not going to be 'happy dancing folks' when they began to suffer Bell's palsy (facial paralysis), neuropathies, cardiac arrhythmias and autoimmune reactions that kill through a blood disorder. 'They're not going to be so happy, happy then, but we're never going to see pictures of those people' she said. Tenpenny described the 'vaccine' as 'a well-designed killing Bad as the initial consequences had been Tenpenny said it would be maybe 14 months before we began to see the 'full ravage' of what is going to happen to the 'Covid vaccinated' with full-out consequences taking anything between two years and 20 years to show. You can understand why when you consider that variations of the 'Covid vaccine' use mRNA (messenger RNA) to in theory activate the immune system to produce protective antibodies without using the actual 'virus'. How can they when it's a computer program and they've never isolated what they claim is the 'real thing'? Instead they use synthetic mRNA. They are inoculating synthetic material into the body which through a technique known as the Trojan horse is absorbed into cells to change the nature of DNA. Human DNA is changed by an infusion of messenger RNA and with each new 'vaccine' of this type it is changed even more. Say so and you are banned by Cult Internet platforms. The contempt the contemptuous Mark Zuckerberg has for the truth and human health can be seen in an internal Facebook video leaked to the Project Veritas investigative team in which he said of the 'Covid vaccines': '... I share some caution on this because we just don't know the long term side-effects of basically



modifying people's DNA and RNA.' At the same time this disgusting man's Facebook was censoring and banning anyone saying exactly the same. He must go before a Nuremberg trial for crimes against humanity when he knows that he is censoring legitimate concerns and denying the right of informed consent on behalf of the Cult that owns him. People have been killed and damaged by the very 'vaccination' technique he cast doubt on himself when they may not have had the 'vaccine' with access to information that he denied them. The plan is to have at least annual 'Covid vaccinations', add others to deal with invented 'variants', and change all other vaccines into the mRNA system. Pfizer executives told shareholders at a virtual Barclays Global Healthcare Conference in March, 2021, that the public may need a third dose of 'Covid vaccine', plus regular yearly boosters and the company planned to hike prices to milk the profits in a 'significant opportunity for our vaccine'. These are the professional liars, cheats and opportunists who are telling you their 'vaccine' is safe. Given this volume of mRNA planned to be infused into the human body and its ability to then replicate we will have a transformation of human genetics from biological to synthetic biological – exactly the long-time Cult plan for reasons we'll see – and many will die. Sherri Tenpenny said of this It's like having an on-button but no off-button and that whole mechanism ... they actually give it a name and they call it the Trojan horse mechanism, because it allows that [synthetic] virus and that piece of that [synthetic] virus to get inside of your cells, start to replicate and even get inserted into other parts of your DNA as a Trojan-horse. Ask the overwhelming majority of people who have the 'vaccine' what they know about the contents and what they do and they would reply: 'The government says it will stop me getting the virus.' Governments give that false impression on purpose to increase take- up. You can read Sherri Tenpenny's detailed analysis of the health consequences in her blog at Vaxxter.com, but in summary these are some of them. She highlights the statement by Bill Gates about how human beings can become their own 'vaccine manufacturing machine'. The man is insane. ['Vaccine'-generated] 'antibodies' carry synthetic messenger RNA into the cells and the damage starts, Tenpenny contends, and she says that lungs can be adversely affected through varying degrees of pus

and bleeding which obviously affects breathing and would be dubbed 'Covid-19'. Even more sinister was the impact of 'antibodies' on macrophages, a white blood cell of the immune system. They consist of Type 1 and Type 2 which have very different functions. She said Type 1 are 'hyper-vigilant' white blood cells which 'gobble up' bacteria etc. However, circumstances be fatal. She says these affects are mitigated by Type 2 macrophages which kick in to calm down the system and stop it going rogue. They clear up dead tissue debris and reduce inflammation that the Type 1 'fire crews' have caused. Type 1 kills the infection and Type 2 heals the damage, she says. This is her punchline with regard to 'Covid vaccinations': She says that mRNA 'antibodies' block Type 2 macrophages by attaching to them and deactivating them. This meant that when the Type 1 response was triggered by infection there was nothing to stop that getting out of hand by calming everything down. There's an on-switch, but no off-switch, she says. What follows can be 'over and out, see you when I Tenpenny also highlights the potential for autoimmune disease – the body attacking itself – which has been associated with vaccines since they first appeared. Infusing a synthetic foreign substance into cells could cause the immune system to react in a panic believing that the body is being overwhelmed by an invader (it is) and the consequences can again be fatal. There is an autoimmune response known as a 'cytokine storm' which I have likened to a homeowner panicked by an intruder and picking up a gun to shoot randomly in all directions before turning the fire on himself. The immune system unleashes a storm of inflammatory response called cytokines to a threat and the body commits hara-kiri. The lesson is that you mess with the body's immune response at your peril and these 'vaccines' seriously – fundamentally – mess with immune response. Tenpenny refers to a consequence called anaphylactic shock which is a severe and highly dangerous allergic reaction when the immune system floods the body with chemicals. She gives the example of having a bee sting which primes the immune system and makes it sensitive to those chemicals. When people are stung again maybe years later the immune response can be so powerful that it leads to anaphylactic shock. Tenpenny relates this 'shock' with regard to the 'Covid vaccine' to something called polyethylene glycol or PEG. Enormous

numbers of people have become sensitive to this over decades of use in a whole range of products and processes including food, drink, skin creams and 'medicine'. Studies have claimed that some 72 percent of people have antibodies triggered by PEG compared with two percent in the 1960s and allergic hypersensitive reactions to this become a gathering cause for concern. Tenpenny points out that the 'mRNA vaccine' is coated in a 'bubble' of polyethylene glycol which has the potential to cause anaphylactic shock through immune sensitivity. Many reports have appeared of people reacting this way after having the 'Covid vaccine'. What do we think is going to happen as humanity has more and more of these 'vaccines'? Tenpenny said: 'All these pictures we have seen with people with these rashes ... these weepy rashes, big reactions on their arms and things like that - it's an acute allergic reaction most likely to the polyethylene glycol that you've been previously primed and Those who have not studied the conspiracy and its perpetrators at length might think that making the population sensitive to PEG and then putting it in these 'vaccines' is just a coincidence. It is not. It is instead testament to how carefully and coldly-planned current events have been and the scale of the conspiracy we are dealing with. Tenpenny further explains that the 'vaccine' mRNA procedure can breach the blood-brain barrier which protects the brain from toxins and other crap that will cause malfunction. In this case they could make two proteins corrupt brain function to cause Amyotrophic lateral sclerosis (ALS) , a progressive nervous system disease leading to loss of muscle control, and frontal lobe degeneration - Alzheimer's and dementia. Immunologist J. Bart Classon published a paper connecting mRNA 'vaccines' to prion disease which can lead to Alzheimer's and other forms of neurodegenerative disease while others have pointed out the potential to affect the placenta in ways that make women infertile. This will become highly significant in the next chapter when I will discuss other aspects of this non-vaccine that relate to its nanotechnology and transmission from the injected to the uninjected. Qualified in idiocy Tenpenny describes how research has confirmed that these 'vaccine'- generated antibodies can interact with a range of other tissues in the body and attack many other organs including the lungs. 'This means that if you have a hundred people

standing in front of you that all got this shot they could have a hundred different symptoms.’ Anyone really think that Cult gofers like the Queen, Tony Blair, Christopher Whitty, Anthony Fauci, and all the other psychopaths have really had this ‘vaccine’ in the pictures we’ve seen? Not a bloody chance. Why don’t doctors all tell us about all these dangers and consequences of the ‘Covid vaccine’? Why instead do they encourage and pressure patients to have the shot? Don’t let’s think for a moment that doctors and medical staff can’t be stupid, lazy, and psychopathic and that’s without the financial incentives to give the jab. Tenpenny again: Some people are going to die from the vaccine directly but a large number of people are going to start to get horribly sick and get all kinds of autoimmune diseases 42 days to maybe a year out. What are they going to do, these stupid doctors who say; ‘Good for you for getting that vaccine.’ What are they going to say; ‘Oh, it must be a mutant, we need to give an extra dose of that vaccine.’ Because now the vaccine, instead of one dose or two doses we need three or four because the stupid physicians aren’t taking the time to learn anything about it. If I can learn this sitting in my living room reading a 19 page paper and several others so can they. There’s nothing special about me, I just take the time to do it. Remember how Sara Kayat, the NHS and TV doctor, said that the ‘Covid vaccine’ would ‘100 percent prevent hospitalisation and death’. Doctors can be idiots like every other profession and they should not be worshipped as infallible. They are not and far from it. Behind many medical and scientific ‘experts’ lies an uninformed prat trying to hide themselves from you although in the ‘Covid’ era many have failed to do so as with UK narrative-repeating ‘TV doctor’ Hilary Jones. Pushing back against the minority of proper doctors and scientists speaking out against the ‘vaccine’ has been the entire edifice of the Cult global state in the form of governments, medical systems, corporations, mainstream media, Silicon Valley, and an army of compliant doctors, medical staff and scientists willing to say anything for money and to enhance their careers by promoting the party line. If you do that you are an ‘expert’ and if you won’t you are an ‘anti-vaxxer’ and ‘Covidiot’. The pressure to be ‘vaccinated’ is incessant. We have even had reports claiming that the ‘vaccine’ can help cure cancer and Alzheimer’s and make the lame

walk. I am waiting for the announcement that it can bring you coffee in the morning and cook your tea. Just as the symptoms of 'Covid' seem to increase by the week so have the miracles of the 'vaccine'. American supermarket giant Kroger Co. offered nearly 500,000 employees in 35 states a \$100 bonus for having the 'vaccine' while donut chain Krispy Kreme promised 'vaccinated' customers a free glazed donut every day for the rest of 2021. Have your DNA changed and you will get a doughnut although we might not have to give you them for long. Such offers and incentives confirm the desperation. Perhaps the worse vaccine-stunt of them all was UK 'Health' Secretary Maĵ-the-prat Hancock on live TV aĜer watching a clip of someone being 'vaccinated' when the roll-out began. Hancock faked tears so badly it was embarrassing. Brain-of-Britain Piers Morgan, the lockdown-supporting, 'vaccine' supporting, 'vaccine' passport- supporting, TV host played along with Hancock – 'You're quite emotional about that' he said in response to acting so atrocious it would have been called out at a school nativity which will presumably today include Mary and Jesus in masks, wise men keeping their camels six feet apart, and shepherds under tent arrest. System-serving Morgan tweeted this: 'Love the idea of covid vaccine passports for everywhere: flights, restaurants, clubs, football, gyms, shops etc. It's time covid-denying, anti-vaxxer loonies had their bullsh\*t bluff called & bar themselves from going anywhere that responsible citizens go.' If only I could aspire to his genius. To think that Morgan, who specialises in shouting over anyone he disagrees with, was lauded as a free speech hero when he lost his job aĜer storming off the set of his live show like a child throwing his dolly out of the pram. If he is a free speech hero we are in real trouble. I have no idea what 'bullsh\*t' means, by the way, the \* throws me The Cult is desperate to infuse its synthetic DNA-changing concoction into everyone and has been using every lie, trick and intimidation to do so. The question of 'Why?' we shall now address. I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted – Alan Turing (1912-1954), the 'Father of artificial intelligence' have been exposing for decades the plan to transform the human body from a biological to a

synthetic-biological state. The new human that I will call Human 2.0 is planned to be connected to artificial intelligence and a global AI 'Smart Grid' that would operate as one global system in which AI would control everything from your fridge to your heating system to your car to your mind. Humans would no longer be 'human', but post-human and sub-human, with their thinking and emotional processes replaced by AI. What I said sounded crazy and beyond science fiction and I could understand that. To any balanced, rational, mind it is crazy. Today, however, that world is becoming reality and it puts the 'Covid vaccine' into its true context. Ray Kurzweil is the ultra-Zionist 'computer scientist, inventor and futurist' and co-founder of the Singularity University. Singularity refers to the merging of humans with machines or 'transhumanism'. Kurzweil has said humanity would be connected to the cyber 'cloud' in the period of the ever-recurring year of 2030: Our thinking ... will be a hybrid of biological and non-biological thinking ... humans will be able to extend their limitations and 'think in the cloud' ... We're going to put gateways to the cloud in our brains ... We're going to gradually merge and enhance ourselves ... In my view, that's the nature of being human – we transcend our limitations. As the technology becomes vastly superior to what we are then the small proportion that is still human gets smaller and smaller and smaller until it's just utterly negligible. They are trying to sell this end-of-humanity-as-we-know-it as the next stage of 'evolution' when we become super-human and 'like the gods'. They are lying to you. Shocked, eh? The population, and again especially the young, have been manipulated into addiction to technologies designed to enslave them for life. First they induced an addiction to smartphones (holdables); next they moved to technology on the body (wearables); and then began the invasion of the body (implantables). I warned way back about the plan for microchipped people and we are now entering that era. We should not be diverted into thinking that this refers only to chips we can see. Most important are the nanochips known as smart dust, neural dust and nanobots which are far too small to be seen by the human eye. Nanotechnology is everywhere, increasingly in food products, and released into the atmosphere by the geoengineering of the skies funded by Bill Gates to 'shut out the Sun' and

'save the planet from global warming'. Gates has been funding a project to spray millions of tonnes of chalk (calcium carbonate) into the stratosphere over Sweden to 'dim the Sun' and cool the Earth. Scientists warned the move could be disastrous for weather systems in ways no one can predict and opposition led to the Swedish space agency announcing that the 'experiment' would not be happening as planned in the summer of 2021; but it shows where the Cult is going with dimming the impact of the Sun and there's an associated plan to change the planet's atmosphere. Who gives psychopath Gates the right to dictate to the entire human race and dismantle planetary systems? The world will not be safe while this man is at large. The global warming hoax has made the Sun, like the gas of life, something to fear when both are essential to good health and human survival (more inversion). The body transforms sunlight into vital vitamin D through a process involving ... cholesterol. This is the cholesterol we are also told to fear. We are urged to take Big Pharma statin drugs to reduce cholesterol and it's all systematic. Reducing cholesterol means reducing vitamin D uptake with all the multiple health problems that will cause. At least if you take statins long term it saves the government from having to pay you a pension. The delivery system to block sunlight is widely referred to as chemtrails although these have a much deeper agenda, too. They appear at first to be contrails or condensation trails streaming from aircraft into cold air at high altitudes. Contrails disperse very quickly while chemtrails do not and spread out across the sky before eventually their content falls to earth. Many times I have watched aircraft cross- cross a clear blue sky releasing chemtrails until it looks like a cloudy day. Chemtrails contain many things harmful to humans and the natural world including toxic heavy metals, aluminium (see Alzheimer's) and nanotechnology. Ray Kurzweil reveals the reason without actually saying so: 'Nanobots will infuse all the matter around us with information. Rocks, trees, everything will become these intelligent creatures.' How do you deliver that? From the sky. Self-replicating nanobots would connect everything to the Smart Grid. The phenomenon of Morgellons disease began in the chemtrail era and the correlation has led to it being dubbed the 'chemtrail disease'. Self-replicating fibres appear in the body that can be pulled out through

the skin. Morgellons fibres continue to grow outside the body and have a form of artificial intelligence. I cover this at greater length in Phantom Self. 'Vaccine' operating system 'Covid vaccines' with their self-replicating synthetic material are also designed to make the connection between humanity and Kurzweil's 'cloud'. American doctor and dedicated campaigner for truth, Carrie Madej, an Internal Medicine Specialist in Georgia with more than 20 years medical experience, has highlighted the nanotechnology aspect of the fake 'vaccines'. She explains how one of the components in at least the Moderna and Pfizer synthetic potions are 'lipid nanoparticles' which are 'like little tiny computer bits' – a 'sci-fi substance' known as nanobots and hydrogel which can be 'triggered at any moment to deliver its payload' and act as 'biosensors'. The synthetic substance had 'the ability to accumulate data from your body like your breathing, your respiration, thoughts and emotions, all kind of things' and each syringe could carry a million nanobots: This substance because it's like little bits of computers in your body, crazy, but it's true, it can do that, [and] obviously has the ability to act through Wi-Fi. It can receive and transmit energy, messages, frequencies or impulses. That issue has never been addressed by these companies. What does that do to the human? Just imagine getting this substance in you and it can react to things all around you, the 5G, your smart device, your phones, what is happening with that? What if something is triggering it, too, like an impulse, a frequency? We have something completely foreign in the human Madej said her research revealed that electromagnetic (EMF) frequencies emitted by phones and other devices had increased dramatically in the same period of the 'vaccine' rollout and she was seeing more people with radiation problems as 5G and other electromagnetic technology was expanded and introduced to schools and hospitals. She said she was 'floored with the EMF coming off the devices she checked. All this makes total sense and syncs with my own work of decades when you think that Moderna refers in documents to its mRNA 'vaccine' as an 'operating system': Recognizing the broad potential of mRNA science, we set out to create an mRNA technology platform that functions very much like an operating system on a computer. It is designed so that it can plug and play interchangeably with different programs. In our case,



the 'program' or 'app' is our mRNA drug – the unique mRNA sequence that codes for a protein ... .. Our MRNA Medicines – 'The 'Software Of Life': When we have a concept for a new mRNA medicine and begin research, fundamental components are already in place. Generally, the only thing that changes from one potential mRNA medicine to another is the coding region – the actual genetic code that instructs ribosomes to make protein. Utilizing these instruction sets gives our investigational mRNA medicines a software-like quality. We also have the ability to combine different mRNA sequences encoding for different proteins in a single mRNA investigational medicine. Who needs a real 'virus' when you can create a computer version to justify infusing your operating system into the entire human race on the road to making living, breathing people into cyborgs? What is missed with the 'vaccines' is the digital connection between synthetic material and the body that I highlighted earlier with the study that hacked a computer with human DNA. On one level the body is digital, based on mathematical codes, and I'll have more about that in the next chapter. Those who ridiculously claim that mRNA 'vaccines' are not designed to change human genetics should explain the words of Dr Tal Zaks, chief medical officer at Moderna, in a 2017 TED talk. He said that over the last 30 years 'we've been living this phenomenal digital scientific revolution, and I'm here today to tell you, that we are actually hacking the software of life, and that it's changing the way we think about prevention and treatment of In every cell there's this thing called messenger RNA, or mRNA for short, that transmits the critical information from the DNA in our genes to the protein, which is really the stuff we're all made out of. This is the critical information that determines what the cell will do. So we think about it as an operating system. So if you could change that, if you could introduce a line of code, or change a line of code, it turns out, that has profound implications for everything, from the flu to cancer. Zaks should more accurately have said that this has profound implications for the human genetic code and the nature of DNA. Communications within the body go both ways and not only one. But, hey, no, the 'Covid vaccine' will not affect your genetics. Cult fact-checkers say so even though the man who helped to develop the mRNA technique says that it does. Zaks said in 2017: If you think about

what it is we're trying to do. We've taken information and our understanding of that information and how that information is transmitted in a cell, and we've taken our understanding of medicine and how to make drugs, and we're fusing the two. We think of it as information therapy. I have been writing for decades that the body is an information field communicating with itself and the wider world. This is why radiation which is information can change the information field of body and mind through phenomena like 5G and change their nature and function. 'Information therapy' means to change the body's information field and change the way it operates. DNA is a receiver- transmitter of information and can be mutated by information like mRNA synthetic messaging. Technology to do this has been ready and waiting in the underground bases and other secret projects to be rolled out when the 'Covid' hoax was played. 'Trials' of such short and irrelevant duration were only for public consumption. When they say the 'vaccine' is 'experimental' that is not true. It may appear to be 'experimental' to those who don't know what's going on, but the trials have already been done to ensure the Cult gets the result it desires. Zaks said that it took decades to sequence the human genome, completed in 2003, but now they could do it in a week. By 'they' he means scientists operating in the public domain. In the secret projects they were sequencing the genome in a week long before even 2003. Deluge of mRNA Highly significantly the Moderna document says the guiding premise is that if using mRNA as a medicine works for one disease then it should work for many diseases. They were leveraging the flexibility afforded by their platform and the fundamental role mRNA plays in protein synthesis to pursue mRNA medicines for a broad spectrum of diseases. Moderna is confirming what I was saying through 2020 that multiple 'vaccines' were planned for 'Covid' (and later invented 'variants') and that previous vaccines would be converted to the mRNA system to infuse the body with massive amounts of genetically-manipulating synthetic material to secure a transformation to a synthetic-biological state. The 'vaccines' are designed to kill stunning numbers as part of the long-exposed Cult depopulation agenda and transform the rest. Given this is the goal you can appreciate why there is such hysterical demand for every human to be 'vaccinated' for an

alleged 'disease' that has an estimated 'infection' to 'death' ratio of 0.23-0.15 percent. As I write children are being given the 'vaccine' in trials (their parents are a disgrace) and ever-younger people are being offered the vaccine for a 'virus' that even if you believe it exists has virtually zero chance of harming them. Horrific effects of the 'trials' on a 12-year-old girl were revealed by a family member to be serious brain and gastric problems that included a bowel obstruction and the inability to swallow liquids or solids. She was unable to eat or drink without throwing up, had extreme pain in her back, neck and abdomen, and was paralysed from the waist down which stopped her urinating unaided. When the girl was first taken to hospital doctors said it was all in her mind. She was signed up for the 'trial' by her parents for whom no words suffice. None of this 'Covid vaccine' insanity makes any sense unless you see what the 'vaccine' really is – a body- changer. Synthetic biology or 'SynBio' is a fast-emerging and expanding scientific discipline which includes everything from genetic and molecular engineering to electrical and computer engineering. Synthetic biology is defined in these ways: A multidisciplinary area of research that seeks to create new biological parts, devices, and systems, or to redesign systems that are already found in nature. The use of a mixture of physical engineering and genetic engineering to create new (and therefore synthetic) life forms. An emerging field of research that aims to combine the knowledge and methods of biology, engineering and related disciplines in the design of chemically-synthesized DNA to create organisms with novel or enhanced characteristics and traits (synthetic organisms including humans). We now have synthetic blood, skin, organs and limbs being developed along with synthetic body parts produced by 3D printers. These are all elements of the synthetic human programme and this comment by Kurzweil's co-founder of the Singularity University, Peter Diamandis, can be seen in a whole new light with the 'Covid' hoax and the sanctions against those that refuse the 'vaccine': Anybody who is going to be resisting the progress forward [to transhumanism] is going to be resisting evolution and, fundamentally, they will die out. It's not a matter of whether it's good or bad. It's going to happen. 'Resisting evolution'? What absolute bollocks. The arrogance of these people is without limit. His 'it's

going to happen' mantra is another way of saying 'resistance is futile' to break the spirit of those pushing back and we must not fall for it. Getting this genetically- transforming 'vaccine' into everyone is crucial to the Cult plan for total control and the desperation to achieve that is clear for anyone to see. Vaccine passports are a major factor in this and they, too, are a form of resistance is futile. It's NOT. The paper funded by the Rockefeller Foundation for the 2013 'health conference' in China We will interact more with artificial intelligence. The use of robotics, bio-engineering to augment human functioning is already well underway and will advance. Re-engineering of humans into potentially separate and unequal forms through genetic engineering or mixed human-robots raises debates on ethics and equality. A new demography is projected to emerge after 2030 [that year again] of technologies (robotics, genetic engineering, nanotechnology) producing robots, engineered organisms, 'nanobots' and artificial intelligence (AI) that can self-replicate. Debates will grow on the implications of an impending reality of human designed life. What is happening today is so long planned. The world army enforcing the will of the world government is intended to be a robot army, not a human one. Today's military and its technologically 'enhanced' troops, pilotless planes and driverless vehicles are just stepping stones to that end. Human soldiers are used as Cult fodder and its time they woke up to that and worked for the freedom of the population instead of their own destruction and their family's destruction – the same with the police. Join us and let's sort this out. The phenomenon of enforce my own destruction is widespread in the 'Covid' era with Woker 'lurvies' in the acting and entertainment industries supporting 'Covid' rules which have destroyed their profession and the same with those among the public who put signs on the doors of their businesses 'closed due to Covid – stay safe' when many will never reopen. It's a form of masochism and most Transgender = transhumanism When something explodes out of nowhere and is suddenly everywhere it is always the Cult agenda and so it is with the tidal wave of claims and demands that have infiltrated every aspect of society under the heading of 'transgenderism'. The term 'trans' is so 'in' and this is the dictionary definition: A prefix meaning 'across', 'through', occurring ... in loanwords from Latin,

used in particular for denoting movement or conveyance from place to place (transfer; transmit; transplant) or complete change (transform; transmute), or to form adjectives meaning 'crossing', 'on the other side of', or 'going beyond' the place named (transmontane; transnational; trans- Transgender means to go beyond gender and transhuman means to go beyond human. Both are aspects of the Cult plan to transform the human body to a synthetic state with no gender. Human 2.0 is not designed to procreate and would be produced technologically with no need for parents. The new human would mean the end of parents and so men, and increasingly women, are being targeted for the deletion of their rights and status. Parental rights are disappearing at an ever-quickenning speed for the same reason. The new human would have no need for men or women when there is no procreation and no gender. Perhaps the transgender movement that appears to be in a permanent state of frenzy might now contemplate on how it is being used. This was never about transgender rights which are only the interim excuse for confusing gender, particularly in the young, on the road to fusing gender. Transgender activism is not an end; it is a means to an end. We see again the technique of creative destruction in which you destroy the status quo to 'build back bejêr' in the form that you want. The gender status quo had to be destroyed by persuading the Cult-created Woke mentality to believe that you can have 100 genders or more. A programme for 9 to 12 year olds produced by the Cult-owned BBC promoted the 100 genders narrative. The very idea may be the most monumental nonsense, but it is not what is true that counts, only what you can make people believe is true. Once the gender of  $2 + 2 = 4$  has been dismantled through indoctrination, intimidation and  $2 + 2 = 5$  then the new no-gender normal can take its place with Human 2.0. Aldous Huxley revealed the plan in his prophetic Brave New World in Natural reproduction has been done away with and children are created, decanted', and raised in 'hatcheries and conditioning centres'. From birth, people are genetically designed to fit into one of five castes, which are further split into 'Plus' and 'Minus' members and designed to fulfil predetermined positions within the social and economic strata of the World State. How could Huxley know this in 1932? For the same reason George Orwell knew

about the Big Brother state in 1948, Cult insiders I have quoted knew about it in 1969, and I have known about it since the early 1990s. If you are connected to the Cult or you work your balls off to uncover the plan you can predict the future. The process is simple. If there is a plan for the world and nothing intervenes to stop it then it will happen. Thus if you communicate the plan ahead of time you are perceived to have predicted the future, but you haven't. You have revealed the plan which without intervention will become the human future. The whole reason I have done what I have is to alert enough people to inspire an intervention and maybe at last that time has come with the Cult and its intentions now so obvious to anyone with a brain in working order. The future is here Technological wombs that Huxley described to replace parent procreation are already being developed and they are only the projects we know about in the public arena. Israeli scientists told The Times of Israel in March, 2021, that they have grown 250-cell embryos into mouse fetuses with fully formed organs using artificial wombs in a development they say could pave the way for gestating humans outside the womb. Professor Jacob Hanna of the Weizmann Institute of Science said: We took mouse embryos from the mother at day five of development, when they are just of 250 cells, and had them in the incubator from day five until day 11, by which point they had grown all their organs. By day 11 they make their own blood and have a beating heart, a fully developed brain. Anybody would look at them and say, 'this is clearly a mouse fetus with all the characteristics of a mouse.' It's gone from being a ball of cells to being an advanced fetus. A special liquid is used to nourish embryo cells in a laboratory dish and they float on the liquid to duplicate the first stage of embryonic development. The incubator creates all the right conditions for its development, Hanna said. The liquid gives the embryo 'all the nutrients, hormones and sugars they need' along with a custom-made electronic incubator which controls gas concentration, pressure and temperature. The cutting-edge in the underground bases and other secret locations will be light years ahead of that, however, and this was reported by the London Guardian in 2017: We are approaching a biotechnological breakthrough. Ectogenesis, the invention of a complete external womb, could completely

change the nature of human reproduction. In April this year, researchers at the Children's Hospital of Philadelphia announced their development of an artificial womb. The article was headed 'Artificial wombs could soon be a reality. What will this mean for women?' What would it mean for children is an even bigger question. No mother to bond with only a machine in preparation for a life of soulless interaction and control in a world governed by machines (see the Matrix movies). Now observe the calculated manipulations of the 'Covid' hoax as human interaction and warmth has been curtailed by distancing, isolation and fear with people communicating via machines on a scale never seen before. These are all dots in the same picture as are all the personal assistants, gadgets and children's toys through which kids and adults communicate with AI as if it is human. The AI 'voice' on Sat-Nav should be included. All these things are psychological preparation for the Cult endgame. Before you can make a physical connection with AI you have to make a psychological connection and that is what people are being conditioned to do with this ever gathering human-AI interaction. Movies and TV programmes depicting the transhuman, robot dystopia relate to a phenomenon known as 'pre-emptive programming' in which the world that is planned is portrayed everywhere in movies, TV and advertising. This is conditioning the conscious and subconscious mind to become familiar with the planned reality to dilute resistance when it happens for real. What would have been a shock such is the change is made less so. We have young children put on the road to transgender transition surgery with puberty blocking drugs at an age when they could never be able to make those life-changing decisions. Rachel Levine, a professor of paediatrics and psychiatry who believes in treating children this way, became America's highest-ranked openly-transgender official when she was confirmed as US Assistant Secretary at the Department of Health and Human Services after being nominated by Joe Biden (the Cult). Activists and governments press for laws to deny parents a say in their children's transition process so the kids can be isolated and manipulated into agreeing to irreversible medical procedures. A Canadian father Robert Hoogland was denied bail by the Vancouver Supreme Court in 2021 and remained in jail for breaching a court order that he stay silent over his

young teenage daughter, a minor, who was being offered life-changing hormone therapy without parental consent. At the age of 12 the girl's 'school counsellor' said she may be transgender, referred her to a doctor and told the school to treat her like a boy. This is another example of state-serving schools imposing ever more control over children's lives while parents have ever less. Contemptible and extreme child abuse is happening all over the world as the Cult gender-fusion operation goes into warp-speed. Why the war on men – and now women? The question about what artificial wombs mean for women should rightly be asked. The answer can be seen in the deletion of women's rights involving sport, changing rooms, toilets and status in favour of people in male bodies claiming to identify as women. I can identify as a mountain climber, but it doesn't mean I can climb a mountain any more than a biological man can be a biological woman. To believe so is a triumph of belief over factual reality which is the very perceptual basis of everything Woke. Women's sport is being destroyed by allowing those with male bodies who say they identify as female to 'compete' with girls and women. Male body 'women' dominate 'women's' competition with their greater muscle mass, bone density, strength and speed. With that disadvantage sport for women loses all meaning. To put this in perspective nearly 300 American high school boys can run faster than the quickest woman sprinter in the world. Women are seeing their previously protected spaces invaded by male bodies simply because they claim to identify as women. That's all they need to do to access all women's spaces and activities under the Biden 'Equality Act' that destroys equality for women with the usual Orwellian Woke inversion. Male sex offenders have already committed rapes in women's prisons after claiming to identify as women to get them transferred. Does this not matter to the Woke 'equality' hypocrites? Not in the least. What matters to Cult manipulators and funders behind transgender activists is to advance gender fusion on the way to the no-gender 'human'. When you are seeking to impose transparent nonsense like this, or the 'Covid' hoax, the only way the nonsense can prevail is through censorship and intimidation of dissenters, deletion of factual information, and programming of the unquestioning, bewildered and naive. You don't have to scan the world



for long to see that all these things are happening. Many women's rights organisations have realised that rights and status which took such a long time to secure are being eroded and that it is systematic. Kara Dansky of the global Women's Human Rights Campaign said that Biden's transgender executive order immediately he took office, subsequent orders, and Equality Act legislation that followed 'seek to erase women and girls in the law as a category'. Exactly. I said during the long ago-started war on men (in which many women play a crucial part) that this was going to turn into a war on them. The Cult is phasing out both male and female genders. To get away with that they are brought into conflict so they are busy fighting each other while the Cult completes the job with no unity of response. Unity, people, unity. We need unity everywhere. Transgender is the only show in town as the big step towards the no-gender human. It's not about rights for transgender people and never has been. Woke political correctness is deleting words relating to genders to the same end. Wokers believe this is to be 'inclusive' when the opposite is true. They are deleting words describing gender because gender itself is being deleted by Human 2.0. Terms like 'man', 'woman', 'mother' and 'father' are being deleted in the universities and other institutions to be replaced by the no-gender, not trans-gender, 'individuals' and 'guardians'. Women's rights campaigner Maria Keffler of Partners for Ethical Care said: 'Children are being taught from kindergarten upward that some boys have a vagina, some girls have a penis, and that kids can be any gender they want to be.' Do we really believe that suddenly countries all over the world at the same time had the idea of having drag queens go into schools or read transgender stories to very young children in the local library? It's coldly-calculated confusion of gender on the way to the fusion of gender. Suzanne Vierling, a psychologist from Southern California, made another important Yesterday's slave woman who endured gynecological medical experiments is today's girl- child being butchered in a booming gender-transitioning sector. Ovaries removed, pushing her into menopause and osteoporosis, uncharted territory, and parents' rights and authority The erosion of parental rights is a common theme in line with the Cult plans to erase the very concept of parents and 'ovaries removed, pushing her into menopause' means what? Those

born female lose the ability to have children – another way to discontinue humanity as we know it. Eliminating Human 1.0 (before our very eyes) To pave the way for Human 2.0 you must phase out Human 1.0. This is happening through plummeting sperm counts and making women infertile through an onslaught of chemicals, radiation (including smartphones in pockets of men) and mRNA ‘vaccines’. Common agriculture pesticides are also having a devastating impact on human fertility. I have been tracking collapsing sperm counts in the books for a long time and in 2021 came a book by fertility scientist and reproductive epidemiologist Shanna Swan, *Count Down: How Our Modern World Is Threatening Sperm Counts, Altering Male and Female Reproductive Development and Imperiling the Future of the Human Race*. She reports how the global fertility rate dropped by half between 1960 and 2016 with America’s birth rate 16 percent below where it needs to be to sustain the population. Women are experiencing declining egg quality, more miscarriages, and more couples suffer from infertility. Other findings were an increase in erectile dysfunction, infant boys developing more genital abnormalities, male problems with conception, and plunging levels of the male hormone testosterone which would explain why so many men have lost their backbone and masculinity. This has been very evident during the ‘Covid’ hoax when women have been prominent among the Pushbackers and big strapping blokes have bowed their heads, covered their faces with a nappy and quietly submitted. Mind control expert Cathy O’Brien also points to how global education introduced the concept of ‘we’re all winners’ in sport and classrooms: ‘Competition was defused, and it in turn defused a sense of fighting back.’ This is another version of the ‘equity’ doctrine in which you drive down rather than raise up. What a contrast in Cult-controlled China with its global ambitions where the government published plans in January, 2021, to ‘cultivate masculinity’ in boys from kindergarten through to high school in the face of a ‘masculinity crisis’. A government adviser said boys would be soon become ‘delicate, timid and effeminate’ unless action was taken. Don’t expect any similar policy in the targeted West. A 2006 study showed that a 65-year-old man in 2002 had testosterone levels 15 percent lower than a 65-year-old man in 1987 while a 2020 study found a similar story with

young adults and adolescents. Men are getting prescriptions for testosterone replacement therapy which causes an even greater drop in sperm count with up to 99 percent seeing sperm counts drop to zero during the treatment. More sperm is defective and malfunctioning with some having two heads or not pursuing an egg. A class of synthetic chemicals known as phthalates are being blamed for the decline. These are found everywhere in plastics, shampoos, cosmetics, furniture, flame retardants, personal care products, pesticides, canned foods and even receipts. Why till receipts? Everyone touches them. Let no one delude themselves that all this is not systematic to advance the long-time agenda for human body transformation. Phthalates mimic hormones and disrupt the hormone balance causing testosterone to fall and genital birth defects in male infants. Animals and fish have been affected in the same way due to phthalates and other toxins in rivers. When fish turn gay or change sex through chemicals in rivers and streams it is a pointer to why there has been such an increase in gay people and the sexually confused. It doesn't matter to me what sexuality people choose to be, but if it's being affected by chemical pollution and consumption then we need to know. Does anyone really think that this is not connected to the transgender agenda, the war on men and the condemnation of male 'toxic masculinity'? You watch this being followed by 'toxic femininity'. It's already happening. When breastfeeding becomes 'chest-feeding', pregnant women become pregnant people along with all the other Woke claptrap you know that the world is going insane and there's a Cult scam in progress. Transgender activists are promoting the Cult agenda while Cult billionaires support and fund the insanity as they laugh themselves to sleep at the sheer stupidity for which humans must be infamous in galaxies far, far away. 'Covid vaccines' and female infertility We can now see why the 'vaccine' has been connected to potential infertility in women. Dr Michael Yeadon, former Vice President and Chief Scientific Advisor at Pfizer, and Dr Wolfgang Wodarg in Germany, filed a petition with the European Medicines Agency in December, 2020, urging them to stop trials for the Pfizer/BioNTech shot and all other mRNA trials until further studies had been done. They were particularly concerned about possible effects on fertility with

'vaccine'-produced antibodies attacking the protein Syncytin-1 which is responsible for developing the placenta. The result would be infertility 'of indefinite duration' in women who have the 'vaccine' with the placenta failing to form. Section 10.4.2 of the Pfizer/BioNTech trial protocol says that pregnant women or those who might become so should not have mRNA shots. Section 10.4 warns men taking mRNA shots to 'be abstinent from heterosexual intercourse' and not to donate sperm. The UK government said that it did not know if the mRNA procedure had an effect on fertility. Did not know? These people have to go to jail. UK government advice did not recommend at the start that pregnant women had the shot and said they should avoid pregnancy for at least two months after 'vaccination'. The 'advice' was later updated to pregnant women should only have the 'vaccine' if the benefits outweighed the risks to mother and foetus. What the hell is that supposed to mean? Then 'spontaneous abortions' began to appear and rapidly increase on the adverse reaction reporting schemes which include only a fraction of adverse reactions. Thousands and ever-growing numbers of 'vaccinated' women are describing changes to their menstrual cycle with heavier blood flow, irregular periods and menstruating again after going through the menopause – all links to reproduction effects. Women are passing blood clots and the lining of their uterus while men report erectile dysfunction and blood effects. Most significantly of all unvaccinated women began to report similar menstrual changes after interaction with 'vaccinated' people and men and children were also affected with bleeding noses, blood clots and other conditions. 'Shedding' is when vaccinated people can emit the content of a vaccine to affect the unvaccinated, but this is different. 'Vaccinated' people were not shedding a 'live virus' allegedly in 'vaccines' as before because the fake 'Covid vaccines' involve synthetic material and other toxicity. Doctors exposing what is happening prefer the term 'transmission' to shedding. Somehow those that have had the shots are transmitting effects to those that haven't. Dr Carrie Madej said the nano-content of the 'vaccines' can 'act like an antenna' to others around them which fits perfectly with my own conclusions. This 'vaccine' transmission phenomenon was becoming known as the book went into production and I deal with this further in the

Postscript. Vaccine effects on sterility are well known. The World Health Organization was accused in 2014 of sterilising millions of women in Kenya with the evidence confirmed by the content of the vaccines involved. The same WHO behind the 'Covid' hoax admitted its involvement for more than ten years with the vaccine programme. Other countries made similar claims. Charges were lodged by Tanzania, Nicaragua, Mexico, and the Philippines. The Gardasil vaccine claimed to protect against a genital 'virus' known as HPV has also been linked to infertility. Big Pharma and the WHO (same thing) are criminal and satanic entities. Then there's the Bill Gates Foundation which is connected through funding and shared interests with 20 pharmaceutical giants and laboratories. He stands accused of directing the policy of United Nations Children's Fund (UNICEF), vaccine alliance GAVI, and other groupings, to advance the vaccine agenda and silence opposition at great cost to women and children. At the same time Gates wants to reduce the global Great Reset = Smart Grid = new human. The Cult agenda I have been exposing for 30 years is now being openly promoted by Cult assets like Gates and Klaus Schwab of the World Economic Forum under code-terms like the 'Great Reset', 'Build Back Better' and 'a rare but narrow window of opportunity to reflect, reimagine, and reset our world'. What provided this 'rare but narrow window of opportunity'? The 'Covid' hoax did. Who created that? They did. My books from not that long ago warned about the planned 'Internet of Things' (IoT) and its implications for human freedom. This was the plan to connect all technology to the Internet and artificial intelligence and today we are way down that road with an estimated 36 billion devices connected to the World Wide Web and that figure is projected to be 76 billion by 2025. I further warned that the Cult planned to go beyond that to the Internet of Everything when the human brain was connected via AI to the Internet and Kurzweil's 'cloud'. Now we have Cult operatives like Schwab calling for precisely that under the term 'Internet of Bodies', a fusion of the physical, digital and biological into one centrally-controlled Smart Grid system which the Cult refers to as the 'Fourth Industrial Revolution'. They talk about the 'biological', but they really mean the synthetic-biological which is required to fully integrate the human body and brain into the Smart Grid and artificial

intelligence planned to replace the human mind. We have everything being synthetically manipulated including the natural world through GMO and smart dust, the food we eat and the human body itself with synthetic 'vaccines'. I said in *The Answer* that we would see the Cult push for synthetic meat to replace animals and in February, 2021, the so predictable psychopath Bill Gates called for the introduction of synthetic meat to save us all from 'climate change'. The climate hoax just keeps on giving like the 'Covid' hoax. The war on meat by vegan activists is a carbon (oops, sorry) copy of the manipulation of transgender activists. They have no idea (except their inner core) that they are being used to promote and impose the agenda of the Cult or that they are only the vehicle and not the reason. This is not to say those who choose not to eat meat shouldn't be respected and supported in that right, but there are ulterior motives for those in power. A Forbes article in December, 2019, highlighted the plan so beloved of Schwab and the Cult under the heading: 'What Is The Internet of Bodies? And How Is It Changing Our World?' The article said the human body is the latest data platform (remember 'our vaccine is an operating system'). Forbes described the plan very accurately and the words could have come straight out of my books from long before: The Internet of Bodies (IoB) is an extension of the IoT and basically connects the human body to a network through devices that are ingested, implanted, or connected to the body in some way. Once connected, data can be exchanged, and the body and device can be remotely monitored and controlled. They were really describing a human hive mind with human perception centrally-dictated via an AI connection as well as allowing people to be 'remotely monitored and controlled'. Everything from a fridge to a human mind could be directed from a central point by these insane psychopaths and 'Covid vaccines' are crucial to this. Forbes explained the process I mentioned earlier of holdable and wearable technology followed by implantable. The article said there were three generations of the Internet of Bodies that Body external: These are wearable devices such as Apple Watches or Fitbits that can monitor our health. Body internal: These include pacemakers, cochlear implants, and digital pills that go inside our bodies to monitor or control various aspects of health. Body embedded: The third generation

of the Internet of Bodies is embedded technology where technology and the human body are melded together and have a real-time connection to a remote Forbes noted the development of the Brain Computer Interface (BCI) which merges the brain with an external device for monitoring and controlling in real-time. 'The ultimate goal is to help restore function to individuals with disabilities by using brain signals rather than conventional neuromuscular pathways.' Oh, do fuck off. The goal of brain interface technology is controlling human thought and emotion from the central point in a hive mind serving its masters wishes. Many people are now agreeing to be chipped to open doors without a key. You can recognise them because they'll be wearing a mask, social distancing and lining up for the 'vaccine'. The Cult plans a Great Reset money system aĜer they have completed the demolition of the global economy in which 'money' will be exchanged through communication with body operating systems. Rand Corporation, a Cult-owned think tank, said of the Internet of Bodies or IoB: Internet of Bodies technologies fall under the broader IoT umbrella. But as the name suggests, IoB devices introduce an even more intimate interplay between humans and gadgets. IoB devices monitor the human body, collect health metrics and other personal information, and transmit those data over the Internet. Many devices, such as fitness trackers, are already in use ... IoB devices ... and those in development can track, record, and store users' whereabouts, bodily functions, and what they see, hear, and even think. Schwab's World Economic Forum, a long-winded way of saying 'fascism' or 'the Cult', has gone full-on with the Internet of Bodies in the 'Covid' era. 'We're entering the era of the Internet of Bodies', it declared, 'collecting our physical data via a range of devices that can be implanted, swallowed or worn'. The result would be a huge amount of health-related data that could improve human wellbeing around the world, and prove crucial in fighting the 'Covid-19 pandemic'. Does anyone think these clowns care about 'human wellbeing' aĜer the death and devastation their pandemic hoax has purposely caused? Schwab and co say we should move forward with the Internet of Bodies because 'Keeping track of symptoms could help us stop the spread of infection, and quickly detect new cases'. How wonderful, but keeping track' is all they are really

bothered about. Researchers were investigating if data gathered from smartwatches and similar devices could be used as viral infection alerts by tracking the user's heart rate and breathing. Schwab said in his 2018 book *Shaping the Future of the Fourth Industrial Revolution*: The lines between technologies and beings are becoming blurred and not just by the ability to create lifelike robots or synthetics. Instead it is about the ability of new technologies to literally become part of us. Technologies already influence how we understand ourselves, how we think about each other, and how we determine our realities. As the technologies ... give us deeper access to parts of ourselves, we may begin to integrate digital technologies into our You can see what the game is. Twenty-four hour control and people – if you could still call them that – would never know when something would go ping and take them out of circulation. It's the most obvious rush to a global fascist dictatorship and the complete submission of humanity and yet still so many are locked away in their Cult-induced perceptual coma and can't see it. Smart Grid control centres The human body is being transformed by the 'vaccines' and in other ways into a synthetic cyborg that can be attached to the global Smart Grid which would be controlled from a central point and other sub- locations of Grid manipulation. Where are these planned to be? Well, China for a start which is one of the Cult's biggest centres of operation. The technological control system and technocratic rule was incubated here to be unleashed across the world after the 'Covid' hoax came out of China in 2020. Another Smart Grid location that will surprise people new to this is Israel. I have exposed in *The Trigger* how Sabbatian technocrats, intelligence and military operatives were behind the horrors of 9/11 and not '19 Arab hijackers' who somehow manifested the ability to pilot big passenger airliners when instructors at puddle-jumping flying schools described some of them as a joke. The 9/11 attacks were made possible through control of civilian and military air computer systems and those of the White House, Pentagon and connected agencies. See *The Trigger* – it will blow your mind. The controlling and coordinating force were the Sabbatian networks in Israel and the United States which by then had infiltrated the entire US government, military and intelligence system. The real name of



the American Deep State is 'Sabbatian State'. Israel is a tiny country of only nine million people, but it is one of the global centres of cyber operations and fast catching Silicon Valley in importance to the Cult. Israel is known as the 'start-up nation' for all the cyber companies spawned there with the Sabbatian specialisation of 'cyber security' that I mentioned earlier which gives those companies access to computer systems of their clients in real time through 'backdoors' written into the coding when security software is downloaded. The Sabbatian centre of cyber operations outside Silicon Valley is the Israeli military Cyber Intelligence Unit, the biggest infrastructure project in Israel's history, headquartered in the desert-city of Beersheba and involving some 20,000 'cyber soldiers'. Here are located a literal army of Internet trolls scanning social media, forums and comment lists for anyone challenging the Cult agenda. The UK military has something similar with its 77th Brigade and associated operations. The Beersheba complex includes research and development centres for other Cult Packard, Cisco Systems, Facebook and Motorola. Techcrunch.com ran an article about the Beersheba global Internet technology centre headlined 'Israel's desert city of Beersheba is turning into a cybertech'. The military's massive relocation of its prestigious technology units, the presence of multinational and local companies, a close proximity to Ben Gurion University and generous government subsidies are turning Beersheba into a major global cybertech hub. Beersheba has all of the ingredients of a vibrant security technology ecosystem, including Ben Gurion University with its graduate program in cybersecurity and Cyber Security Research Center, and Lockheed Martin. It's also the future home of the INCB (Israeli National Cyber Bureau); offers a special income tax incentive for cyber security companies, and was the site for the relocation of the army's intelligence corps units. Sabbatians have taken over the cyber world through the following process: They scan the schools for likely cyber talent and develop them at Ben Gurion University and their period of conscription in the Israeli Defense Forces when they are stationed at the Beersheba complex. When the cyber talented officially leave the army they are funded to start cyber companies with technology developed by themselves or given to them by the state. Much of this is stolen through backdoors of

computer systems around the world with America top of the list. Others are sent off to Silicon Valley to start companies or join the major ones and so we have many major positions filled by apparently 'Jewish' but really Sabbatian operatives. Google, YouTube and Facebook are all run by 'Jewish' CEOs while Twiŕer is all but run by ultra-Zionist hedge-fund shark Paul Singer. At the centre of the Sabbatian global cyber web is the Israeli army's Unit 8200 which specialises in hacking into computer systems of other countries, inserting viruses, gathering information, instigating malfunction, and even taking control of them from a distance. A long list of Sabbatians involved with 9/11, Silicon Valley and Israeli cyber security companies are operatives of Unit 8200. This is not about Israel. It's about the Cult. Israel is planned to be a Smart Grid hub as with China and what is happening at Beersheba is not for the benefit of Jewish people who are treated disgustingly by the Sabbatian elite that control the country. A glance at the Nuremberg Codes will tell you that. The story is much bigger than 'Covid', important as that is to where we are being taken. Now, though, it's time to really strap in. There's more ... much more ... Who controls the Cult? Awake, arise or be forever fall'n John Milton, Paradise Lost have exposed this far the level of the Cult conspiracy that operates in the world of the seen and within the global secret society and satanic network which operates in the shadows one step back from the seen. The story, however, goes much deeper than that. The 'Covid' hoax is major part of the Cult agenda, but only part, and to grasp the biggest picture we have to expand our aŕtention beyond the realm of human sight and into the infinity of possibility that we cannot see. It is from here, ultimately, that humanity is being manipulated into a state of total control by the force which dictates the actions of the Cult. How much of reality can we see? Next to damn all is the answer. We may appear to see all there is to see in the 'space' our eyes survey and observe, but liŕle could be further from the truth. The human 'world' is only a tiny band of frequency that the body's visual and perceptual systems can decode into perception of a 'world'. According to mainstream science the electromagnetic spectrum is 0.005 percent of what exists in the Universe (Fig 10). The maximum estimate I have seen is 0.5 percent and either way it's miniscule. I say it is far, far,

smaller even than 0.005 percent when you compare reality we see with the totality of reality that we don't. Now get this if you are new to such information: Visible light, the only band of frequency that we can see, is a fraction of the 0.005 percent (Fig 11 overleaf). Take this further and realise that our universe is one of infinite universes and that universes are only a fragment of overall reality – infinite reality. Then compare that with the almost infinitesimal frequency band of visible light or human sight. You see that humans are as near blind as it is possible to be without actually being so. Artist and filmmaker, Sergio Toporek, Figure 10: Humans can perceive such a tiny band of visual reality it's laughable. Figure 11: We can see a smear of the 0.005 percent electromagnetic spectrum, but we still know it all. Yep, makes sense. Consider that you can see less than 1% of the electromagnetic spectrum and hear less than 1% of the acoustic spectrum. 90% of the cells in your body carry their own microbial DNA and are not 'you'. The atoms in your body are 99.999999999999999% empty space and none of them are the ones you were born with ... Human beings have 46 chromosomes, two less than a potato. The existence of the rainbow depends on the conical photoreceptors in your eyes; to animals without cones, the rainbow does not exist. So you don't just look at a rainbow, you create it. This is pretty amazing, especially considering that all the beautiful colours you see represent less than 1% of the electromagnetic spectrum. Suddenly the 'world' of humans looks a very different place. Take into account, too, that Planet Earth when compared with the projected size of this single universe is the equivalent of a billionth of a pinhead. Imagine the ratio that would be when compared to infinite reality. To think that Christianity once insisted that Earth and humanity were the centre of everything. This background is vital if we are going to appreciate the nature of 'human' and how we can be manipulated by an unseen force. To human visual reality virtually everything is unseen and yet the prevailing perception within the institutions and so much of the public is that if we can't see it, touch it, hear it, taste it and smell it then it cannot exist. Such perception is indoctrinated and encouraged by the Cult and its agents because it isolates believers in the strictly limited, village-idiot, realm of the five senses where perceptions can be firewalled and information controlled. Most of those

perpetuating the 'this-world-is-all-there-is' insanity are themselves indoctrinated into believing the same delusion. While major players and influencers know that official reality is laughable most of those in science, academia and medicine really believe the nonsense they peddle and teach succeeding generations. Those who challenge the orthodoxy are dismissed as nujers and freaks to protect the manufactured illusion from exposure. Observe the dynamic of the 'Covid' hoax and you will see how that takes the same form. The inner-circle psychopaths knows it's a gigantic scam, but almost the entirety of those imposing their fascist rules believe that 'Covid' is all that they're told it is. Ask people who they are and they will give you their name, place of birth, location, job, family background and life story. Yet that is not who they are – it is what they are experiencing. The difference is absolutely crucial. The true 'I', the eternal, infinite 'I', is consciousness, a state of being aware. Forget 'form'. That is a vehicle for a brief experience. Consciousness does not come from the brain, but through the brain and even that is more symbolic than literal. We are awareness, pure awareness, and this is what withdraws from the body at what we call 'death' to continue our eternal beingness, isness, in other realms of reality within the limitlessness of infinity or the Biblical 'many mansions in my father's house'. Labels of a human life, man, woman, transgender, black, white, brown, nationality, circumstances and income are not who we are. They are what we are – awareness – is experiencing in a brief connection with a band of frequency we call 'human'. The labels are not the self; they are, to use the title of one of my books, a Phantom Self. I am not David Icke born in Leicester, England, on April 29th, 1952. I am the consciousness having that experience. The Cult and its non-human masters seek to convince us through the institutions of 'education', science, medicine, media and government that what we are experiencing is who we are. It's so easy to control and direct perception locked away in the bewildered illusions of the five senses humanity aware of its true self and its true power to consciously create its reality and experience. How is it possible to do this? We do it all day every day. If you perceive yourself as 'lijle me' with no power to impact upon your life and the world then your life experience will reflect that. You will hand the power you don't think you have to authority in all

its forms which will use it to control your experience. This, in turn, will appear to confirm your perception of 'little me' in a self-fulfilling feedback loop. But that is what 'little me' really is – a perception. We are all 'big-me', infinite me, and the Cult has to make us forget that if its will is to prevail. We are therefore manipulated and pressured into self-identifying with human labels and not the consciousness/awareness experiencing those human. The phenomenon of identity politics is a Cult-instigated manipulation technique to sub-divide previous labels into even smaller ones. A United States university employs this list of letters to describe student identity: LGBTQFAGPBDSM or lesbian, gay, bisexual, transgender, transsexual, queer, questioning, flexual, asexual, gender-fuck, polyamorous, bondage/discipline, dominance/submission and sadism/masochism. I'm sure other lists are even longer by now as people feel the need to self-identity the 'I' with the minutiae of race and sexual preference. Workers programmed by the Cult for generations believe this is about 'inclusivity' when it's really the Cult locking them away into smaller and smaller versions of Phantom Self while firewalling them from the influence of their true self, the infinite, eternal 'I'. You may notice that my philosophy which contends that we are all unique points of attention/awareness within the same infinite whole or Oneness is the ultimate non-racism. The very sense of Oneness makes the judgement of people by their body-type, colour or sexuality utterly ridiculous and confirms that racism has no understanding of reality (including anti-white racism). Yet despite my perception of life Cult agents and fast-asleep Workers label me racist to discredit my information while they are themselves phenomenally racist and sexist. All they see is race and sexuality and they judge people as good or bad, demons or untouchables, by their race and sexuality. All they see is Phantom Self and perceive themselves in terms of Phantom Self. They are pawns and puppets of the Cult agenda to focus attention and self-identity in the five senses and play those identities against each other to divide and rule. Columbia University has introduced segregated graduations in another version of social distancing designed to drive people apart and teach them that different racial and cultural groups have nothing in common with each other. The last thing the Cult wants is unity. Again the pump-primers of

this will be Cult operatives in the knowledge of what they Phantom Self blind. We do have something in common – we are all the same consciousness having different temporary experiences. What is this ‘human’? Yes, what is ‘human’? That is what we are supposed to be, right? I mean ‘human’? True, but ‘human’ is the experience not the ‘I’. Break it down to basics and ‘human’ is the way that information is processed. If we are to experience and interact with this band of frequency we call the ‘world’ we must have a vehicle that operates within that band of frequency. Our consciousness in its prime form cannot do that; it is way beyond the frequency of the human realm. My consciousness or awareness could not tap these keys and pick up the cup in front of me in the same way that radio station A cannot interact with radio station B when they are on different frequencies. The human body is the means through which we have that interaction. I have long described the body as a biological computer which processes information in a way that allows consciousness to experience this reality. The body is a receiver, transmitter and processor of information in a particular way that we call human. We visually perceive only the world of the five senses in a wakened state – that is the limit of the body’s visual decoding system. In truth it’s not even visual in the way we experience ‘visual reality’ as I will come to in a moment. We are ‘human’ because the body processes the information sources of human into a reality and behaviour system that we perceive as human. Why does an elephant act like an elephant and not like a human or a duck? The elephant’s biological computer is a different information field and processes information according to that program into a visual and behaviour type we call an elephant. The same applies to everything in our reality. These body information fields are perpetuated through procreation (like making a copy of a software program). The Cult wants to break that cycle and intervene technologically to transform the human information field into one that will change what we call humanity. If it can change the human information field it will change the way that field processes information and change humanity both ‘physically’ and psychologically. Hence the messenger (information) RNA ‘vaccines’ and so much more that is targeting human genetics by changing the body’s information – messaging – construct through food, drink, radiation,

toxicity and other means. Reality that we experience is nothing like reality as it really is in the same way that the reality people experience in virtual reality games is not the reality they are really living in. The game is only a decoded source of information that appears to be a reality. Our world is also an information construct – a simulation (more later). In its base form our reality is a wavefield of information much the same in theme as Wi-Fi. The five senses decode wavefield information into electrical information which they communicate to the brain to decode into holographic (illusory 'physical') information. Different parts of the brain specialise in decoding different senses and the information is fused into a reality that appears to be outside of us but is really inside the brain and the genetic structure in general (Fig 12 overleaf). DNA is a receiver-transmitter of information and a vital part of this decoding process and the body's connection to other realities. Change DNA and you change the way we decode and connect with reality – see 'Covid vaccines'. Think of computers decoding Wi-Fi. You have information encoded in a radiation field and the computer decodes that information into a very different form on the screen. You can't see the Wi-Fi until its information is made manifest on the screen and the information on the screen is inside the computer and not outside. I have just described how we decode the 'human world'. All five senses decode the waveform 'Wi-Fi' field into electrical signals and the brain (computer) constructs reality inside the brain and not outside – 'You don't just look at a rainbow, you create it'. Sound is a simple example. We don't hear sound until the brain decodes it. Waveform sound waves are picked up by the hearing sense and communicated to the brain in an electrical form to be decoded into the sounds that we hear. Everything we hear is inside the brain along with everything we see, feel, smell and taste. Words and language are waveform fields generated by our vocal chords which pass through this process until they are decoded by the brain into words that we hear. Different languages are different frequency fields or sound waves generated by vocal chords. Late British philosopher Alan Watts said: Figure 12: The brain receives information from the five senses and constructs from that our [Without the brain] the world is devoid of light, heat, weight, solidity, motion, space, time or any other imaginable feature. All these

phenomena are interactions, or transactions, of vibrations with a certain arrangement of neurons. That's exactly what they are and scientist Robert Lanza describes in his book, *Biocentrism*, how we decode electromagnetic waves and energy into visual and 'physical' experience. He uses the example of a flame emitting photons, electromagnetic energy, each pulsing electrically and magnetically: ... these ... invisible electromagnetic waves strike a human retina, and if (and only if) the waves happen to measure between 400 and 700 nano meters in length from crest to crest, then their energy is just right to deliver a stimulus to the 8 million cone-shaped cells in the retina. Each in turn send an electrical pulse to a neighbour neuron, and on up the line this goes, at 250 mph, until it reaches the ... occipital lobe of the brain, in the back of the head. There, a cascading complex of neurons fire from the incoming stimuli, and we subjectively perceive this experience as a yellow brightness occurring in a place we have been conditioned to call the 'external world'. You hear what you decode. If a tree falls or a building collapses they make no noise unless someone is there to decode the energetic waves generated by the disturbance into what we call sound. Does a falling tree make a noise? Only if you hear it – decode it. Everything in our reality is a frequency field of information operating within the overall 'Wi-Fi' field that I call The Field. A vibrational disturbance is generated in The Field by the fields of the falling tree or building. These disturbance waves are what we decode into the sound of them falling. If no one is there to do that then neither will make any noise. Reality is created by the observer – decoder – and the perceptions of the observer affect the decoding process. For this reason different people – different perceptions – will perceive the same reality or situation in a different way. What one may perceive as a nightmare another will see as an opportunity. The question of why the Cult is so focused on controlling human perception now answers itself. All experienced reality is the act of decoding and we don't experience Wi-Fi until it is decoded on the computer screen. The sight and sound of an Internet video is encoded in the Wi-Fi all around us, but we don't see or hear it until the computer decodes that information. Taste, smell and touch are all phenomena of the brain as a result of the same process. We don't taste, smell or feel anything except in the brain and



there are pain relief techniques that seek to block the signal from the site of discomfort to the brain because if the brain doesn't decode that signal we don't feel pain. Pain is in the brain and only appears to be at the point of impact thanks to the feedback loop between them. We don't see anything until electrical information from the sight senses is decoded in an area at the back of the brain. If that area is damaged we can go blind when our eyes are perfectly okay. So why do we go blind if we damage an eye? We damage the information processing between the waveform visual information and the visual decoding area of the brain. If information doesn't reach the brain in a form it can decode then we can't see the visual reality that it represents. What's more the brain is decoding only a fraction of the information it receives and the rest is absorbed by the sub-conscious mind. This explanation is from the science magazine, Every second, 11 million sensations crackle along these [brain] pathways ... The brain is confronted with an alarming array of images, sounds and smells which it rigorously filters down until it is left with a manageable list of around 40. Thus 40 sensations per second make up what we perceive as reality. The 'world' is not what people are told to believe that is it and the inner circles of the Cult know that. Illusory 'physical' reality We can only see a smear of 0.005 percent of the Universe which is only one of a vast array of universes – 'mansions' – within infinite reality. Even then the brain decodes only 40 pieces of information ('sensations') from a potential 11 million that we receive every second. Two points strike you from this immediately: The sheer breathtaking stupidity of believing we know anything so rigidly that there's nothing more to know; and the potential for these processes to be manipulated by a malevolent force to control the reality of the population. One thing I can say for sure with no risk of contradiction is that when you can perceive an almost indescribable fraction of infinite reality there is always more to know as in tidal waves of it. Ancient Greek philosopher Socrates was so right when he said that wisdom is to know how little we know. How obviously true that is when you think that we are experiencing a physical world of solidity that is neither physical nor solid and a world of apartness when everything is connected. Cult-controlled 'science' dismisses the so-called 'paranormal' and all phenomena related to

that when the 'para'-normal is perfectly normal and explains the alleged 'great mysteries' which dumbfound scientific minds. There is a reason for this. A 'scientific mind' in terms of the mainstream is a material mind, a five-sense mind imprisoned in see it, touch it, hear it, smell it and taste it. Phenomena and happenings that can't be explained that way leave the 'scientific mind' bewildered and the rule is that if they can't account for why something is happening then it can't, by definition, be happening. I beg to differ. Telepathy is thought waves passing through The Field (think wave disturbance again) to be decoded by someone able to connect with that wavelength (information). For example: You can pick up the thought waves of a friend at any distance and at the very least that will bring them to mind. A few minutes later the friend calls you. 'My god', you say, 'that's incredible – I was just thinking of you.' Ah, but they were thinking of you before they made the call and that's what you decoded. Native peoples not entrapped in five-sense reality do this so well it became known as the 'bush telegraph'. Those known as across dimensions of reality. 'Mind over matter' comes from the fact that matter and mind are the same. The state of one influences the state of the other. Indeed one and the other are illusions. They are aspects of the same field. Paranormal phenomena are all explainable so why are they still considered 'mysteries' or not happening? Once you go down this road of understanding you begin to expand awareness beyond the five senses and that's the nightmare for the Figure 13: Holograms are not solid, but the best ones appear to be. Figure 14: How holograms are created by capturing a waveform version of the subject image. Our reality is not solid, it is holographic. We are now well aware of holograms which are widely used today. Two-dimensional information is decoded into a three-dimensional reality that is not solid although can very much appear to be (Fig 13). Holograms are created with a laser divided into two parts. One goes directly onto a holographic photographic print ('reference beam') and the other takes a waveform image of the subject ('working beam') before being directed onto the print where it 'collides' with the other half of the laser (Fig 14). This creates a waveform interference pattern which contains the wavefield information of whatever is being photographed (Fig 15 overleaf). The process can be

likened to dropping pebbles in a pond. Waves generated by each one spread out across the water to collide with the others and create a wave representation of where the stones fell and at what speed, weight and distance. A waveform interference pattern of a hologram is akin to the waveform information in The Field which the five senses decode into electrical signals to be decoded by the brain into a holographic illusory 'physical' reality. In the same way when a laser (think human attention) is directed at the waveform interference pattern a three-dimensional version of the subject is projected into apparently 'solid' reality (Fig 16). An amazing trait of holograms reveals more 'paranormal mysteries'. Information of the whole hologram is encoded in waveform in every part of the interference pattern by the way they are created. This means that every part of a hologram is a smaller version of the whole. Cut the interference wave-pattern into four and you won't get four parts of the image. You get quarter-sized versions of the whole image. The body is a hologram and the same applies. Here we have the basis of acupuncture, reflexology and other forms of healing which identify representations of the whole body in all of the parts, hands, feet, ears, everywhere. Skilled palm readers can do what they do because the information of whole body is encoded in the hand. The concept of as above, so below, comes from this. Figure 15: A waveform interference pattern that holds the information that transforms into a Figure 16: Holographic people including 'Elvis' holographically inserted to sing a duet with The question will be asked of why, if solidity is illusory, we can't just walk through walls and each other. The resistance is not solid against solid; it is electromagnetic field against electromagnetic field and we decode this into the experience of solid against solid. We should also not underestimate the power of belief to dictate reality. What you believe is impossible will be. Your belief impacts on your decoding processes and they won't decode what you think is impossible. What we believe we perceive and what we perceive we experience. 'Can't dos' and 'impossibles' are like a firewall in a computer system that won't put on the screen what the firewall blocks. How vital that is to understanding how human experience has been hijacked. I explain in The Answer, Everything You Need To Know But Have Never Been Told and other books a long list of 'mysteries' and

'paranormal' phenomena that are not mysterious and perfectly normal once you realise what reality is and how it works. 'Ghosts' can be seen to pass through 'solid' walls because the walls are not solid and the ghost is a discarnate entity operating on a frequency so different to that of the wall that it's like two radio stations sharing the same space while never interfering with each other. I have seen ghosts do this myself. The apartness of people and objects is also an illusion. Everything is connected by the Field like all sea life is connected by the sea. It's just that within the limits of our visual reality we only 'see' holographic information and not the field of information that connects everything and from which the holographic world is made manifest. If you can only see holographic 'objects' and not the field that connects them they will appear to you as unconnected to each other in the same way that we see the computer while not seeing the Wi-Fi. What you don't know can hurt you Okay, we return to those 'two worlds' of human society and the Cult with its global network of interconnecting secret societies and satanic groups which manipulate through governments, corporations, media, religions, etc. The fundamental difference between them is knowledge. The idea has been to keep humanity ignorant of the plan for its total enslavement underpinned by a crucial ignorance of reality – who we are and where we are – and how we interact with it. 'Human' should be the interaction between our expanded eternal consciousness and the five-sense body experience. We are meant to be in this world in terms of the five senses but not of this world in relation to our greater consciousness and perspective. In that state we experience the small picture of the five senses within the wider context of the big picture of awareness beyond the five senses. Put another way the five senses see the dots and expanded awareness connects them into pictures and patterns that give context to the apparently random and unconnected. Without the context of expanded awareness the five senses see only apartness and randomness with apparently no meaning. The Cult and its other-dimensional controllers seek to intervene in the frequency realm where five-sense reality is supposed to connect with expanded reality and to keep the two apart (more on this in the final chapter). When that happens five-sense mental and emotional processes are no longer influenced by expanded

awareness, or the True 'I', and instead are driven by the isolated perceptions of the body's decoding systems. They are in the world and of it. Here we have the human plight and why humanity with its potential for infinite awareness can be so easily manipulatable and descend into such extremes of stupidity. Once the Cult isolates five-sense mind from expanded awareness it can then program the mind with perceptions and beliefs by controlling information that the mind receives through the 'education' system of the formative years and the media perceptual bombardment and censorship of an entire lifetime. Limit perception and a sense of the possible through limiting knowledge by limiting and skewing information while censoring and discrediting that which could set people free. As the title of another of my books says ... And The Truth Shall Set You Free. For this reason the last thing the Cult wants in circulation is the truth about anything – especially the reality of the eternal 'I' – and that's why it is desperate to control information. The Cult knows that information becomes perception which becomes behaviour which, collectively, becomes human society. Cult-controlled and funded mainstream 'science' denies the existence of an eternal 'I' and seeks to dismiss and trash all evidence to the contrary. Cult-controlled mainstream religion has a version of 'God' that is little more than a system of control and dictatorship that employs threats of damnation in an afterlife to control perceptions and behaviour in the here and now through fear and guilt. Neither is true and it's the 'neither' that the Cult wishes to suppress. This 'neither' is that everything is an expression, a point of attention, within an infinite state of consciousness which is the real meaning of the term 'God'. Perceptual obsession with the 'physical body' and five-senses means that 'God' becomes personified as a bearded bloke sitting among the clouds or a raging bully who loves us if we do what 'he' wants and condemns us to the fires of hell if we don't. These are no more than a 'spiritual' fairy tales to control and dictate events and behaviour through fear of this 'God' which has bizarrely made 'God-fearing' in religious circles a state to be desired. I would suggest that fearing anything is not to be encouraged and celebrated, but rather deleted. You can see why 'God fearing' is so beneficial to the Cult and its religions when they decide what 'God' wants and what 'God' demands (the Cult demands) that

everyone do. As the great American comedian Bill Hicks said satirising a Christian zealot: 'I think what God meant to say.' How much of this infinite awareness ('God') that we access is decided by how far we choose to expand our perceptions, self-identity and sense of the possible. The scale of self-identity reflects itself in the scale of awareness that we can connect with and are influenced by – how much knowing and insight we have instead of programmed perception. You cannot expand your awareness into the infinity of possibility when you believe that you are like me Peter the postman or Mary in marketing and nothing more. I'll deal with this in the concluding chapter because it's crucial to how we turnaround current events.

Where the Cult came from When I realised in the early 1990s there was a Cult network behind global events I asked the obvious question: When did it start? I took it back to ancient Rome and Egypt and on to Babylon and Sumer in Mesopotamia, the 'Land Between Two Rivers', in what we now call Iraq. The two rivers are the Tigris and Euphrates and this region is of immense historical and other importance to the Cult, as is the land called Israel only 550 miles away by air. There is much more going on with deep esoteric meaning across this whole region. It's not only about 'wars for oil'. Priceless artefacts from Mesopotamia were stolen or destroyed after the American and British invasion of Iraq in 2003 justified by the lies of George W. Bush and Tony Blair (their Cult masters) about non-existent 'weapons of mass destruction'.

Mesopotamia was the location of Sumer (about 5,400BC to 1,750BC), and Babylon (about 2,350BC to 539BC). Sabbatians may have become immensely influential in the Cult in modern times but they are part of a network that goes back into the mists of history. Sumer is said by historians to be the 'cradle of civilisation'. I disagree. I say it was the re-start of what we call human civilisation after cataclysmic events symbolised in part as the 'Great Flood' destroyed the world that existed before. These fantastic upheavals that I have been describing in detail in the books since the early 1990s appear in accounts and legends of ancient cultures across the world and they are supported by geological and biological evidence. Stone tablets found in Iraq detailing the Sumer period say the cataclysms were caused by non-human 'gods' they call the Anunnaki. These are described in terms of extraterrestrial visitations in which knowledge

supplied by the Anunnaki is said to have been the source of at least one of the world's oldest writing systems and developments in astronomy, mathematics and architecture that were way ahead of their time. I have covered this subject at length in *The Biggest Secret* and *Children of the Matrix* and the same basic 'Anunnaki' story can be found in Zulu accounts in South Africa where the late and very great Zulu high shaman Credo Mutwa told me that the Sumerian Anunnaki were known by Zulus as the Chitauri or 'children of the serpent'. See my six-hour video interview with Credo on this subject entitled *The Reptilian Agenda* recorded at his then home near Johannesburg in 1999 which you can watch on the Ickonic media platform. The Cult emerged out of Sumer, Babylon and Egypt (and elsewhere) and established the Roman Empire before expanding with the Romans into northern Europe from where many empires were savagely imposed in the form of Cult-controlled societies all over the world. Mass death and destruction was their calling card. The Cult established its centre of operations in Europe and European Empires were Cult empires which allowed it to expand into a global force. Spanish and Portuguese colonialists headed for Central and South America while the British and French targeted North America. Africa was colonised by Britain, France, Belgium, the Netherlands, Portugal, Spain, Italy, and Germany. Some like Britain and France moved in on the Middle East. The British Empire was by far the biggest for a simple reason. By now Britain was the headquarters of the Cult from which it expanded to form Canada, the United States, Australia and New Zealand. The Sun never set on the British Empire such was the scale of its occupation. London remains a global centre for the Cult along with Rome and the Vatican although others have emerged in Israel and China. It is no accident that the 'virus' is alleged to have come out of China while Italy was chosen as the means to terrify the Western population into compliance with 'Covid' fascism. Nor that Israel has led the world in 'Covid' fascism and mass 'vaccination'. You would think that I would mention the United States here, but while it has been an important means of imposing the Cult's will it is less significant than would appear and is currently in the process of having what power it does have deleted. The Cult in Europe has mostly loaded the guns for the US to fire. America has been controlled from

Europe from the start through Cult operatives in Britain and Europe. The American Revolution was an illusion to make it appear that America was governing itself while very different forces were pulling the strings in the form of Cult families such as the Rothschilds through the Rockefellers and other subordinates. The Rockefellers are extremely close to Bill Gates and established both scalpel and drug 'medicine' and the World Health Organization. They play a major role in the development and circulation of vaccines through the Rockefeller Foundation on which Bill Gates said his Foundation is based. Why wouldn't this be the case when the Rockefellers and Gates are on the same team? Cult infiltration of human society goes way back into what we call history and has been constantly expanding and centralising power with the goal of establishing a global structure to dictate everything. Look how this has been advanced in great leaps with the 'Covid' hoax. The non-human dimension I researched and observed the comings and goings of Cult operatives through the centuries and even thousands of years as they were born, worked to promote the agenda within the secret society and satanic networks, and then died for others to replace them. Clearly there had to be a coordinating force that spanned this entire period while operatives who would not have seen the end goal in their lifetimes came and went advancing the plan over millennia. I went in search of that coordinating force with the usual support from the extraordinary synchronicity of my life which has been an almost daily experience since 1990. I saw common themes in religious texts and ancient cultures about a non-human force manipulating human society from the hidden. Christianity calls this force Satan, the Devil and demons; Islam refers to the Jinn or Djinn; Zulus have their Chitauri (spelt in other ways in different parts of Africa); and the Gnostic people in Egypt in the period around and before 400AD referred to this phenomena as the 'Archons', a word meaning rulers in Greek. Central American cultures speak of the 'Predators' among other names and the same theme is everywhere. I will use 'Archons' as a collective name for all of them. When you see how their nature and behaviour is described all these different sources are clearly talking about the same force. Gnostics described the Archons in terms of 'luminous fire' while Islam relates the Jinn to 'smokeless



fire'. Some refer to beings in form that could occasionally be seen, but the most common of common theme is that they operate from unseen realms which means almost all existence to the visual processes of humans. I had concluded that this was indeed the foundation of human control and that the Cult was operating within the human frequency band on behalf of this hidden force when I came across the writings of Gnostics which supported my conclusions in the most extraordinary way. A sealed earthen jar was found in 1945 near the town of Nag Hammadi about 75-80 miles north of Luxor on the banks of the River Nile in Egypt. Inside was a treasure trove of manuscripts and texts left by the Gnostic people some 1,600 years earlier. They included 13 leather-bound papyrus codices (manuscripts) and more than 50 texts written in Coptic Egyptian estimated to have been hidden in the jar in the period of 400AD although the source of the information goes back much further. Gnostics oversaw the Great or Royal Library of Alexandria, the fantastic depository of ancient texts detailing advanced knowledge and accounts of human history. The Library was dismantled and destroyed in stages over a long period with the death-blow delivered by the Cult-established Roman Church in the period around 415AD. The Church of Rome was the Church of Babylon relocated as I said earlier. Gnostics were not a race. They were a way of perceiving reality. Whenever they established themselves and their information circulated the terrorists of the Church of Rome would target them for destruction. This happened with the Great Library and with the Gnostic Cathars who were burned to death by the psychopaths after a long period of oppression at the siege of the Castle of Monségur in southern France in 1244. The Church has always been terrified of Gnostic information which demolishes the official Christian narrative although there is much in the Bible that supports the Gnostic view if you read it in another way. To anyone studying the texts of what became known as the Nag Hammadi Library it is clear that great swathes of Christian and Biblical belief has its origin with Gnostics sources going back to Sumer. Gnostic themes have been twisted to manipulate the perceived reality of Bible believers. Biblical texts have been in the open for centuries where they could be changed while Gnostic documents found at Nag Hammadi were sealed away and untouched for 1,600 years. What you see is

what they wrote. Use your pneuma not your nous Gnosticism and Gnostic come from 'gnosis' which means knowledge, or rather secret knowledge, in the sense of spiritual awareness – knowledge about reality and life itself. The desperation of the Cult's Church of Rome to destroy the Gnostics can be understood when the knowledge they were circulating was the last thing the Cult wanted the population to know. Sixteen hundred years later the same Cult is working hard to undermine and silence me for the same reason. The dynamic between knowledge and ignorance is a constant. 'Time' appears to move on, but essential themes remain the same. We are told to 'use your nous', a Gnostic word for head/brain/intelligence. They said, however, that spiritual awakening or 'salvation' could only be secured by expanding awareness beyond what they called nous and into pneuma or Infinite Self. Obviously as I read these texts the parallels with what I have been saying since 1990 were fascinating to me. There is a universal truth that spans human history and in that case why wouldn't we be talking the same language 16 centuries apart? When you free yourself from the perception program of the five senses and explore expanded realms of consciousness you are going to connect with the same information no matter what the perceived 'era' within a manufactured timeline of a single and tiny range of manipulated frequency. Humans working with 'smart' technology or knocking rocks together in caves is only a timeline appearing to operate within the human frequency band. Expanded awareness and the knowledge it holds have always been there whether the era be Stone Age or computer age. We can only access that knowledge by opening ourselves to its frequency which the five-sense prison cell is. Zuckerberg, Brin, Page, Wojcicki, Bezos, and all the others behind the 'Covid' hoax clearly have a long wait before their range of frequency can make that connection given that an open heart is crucial to that as we shall see. Instead of accessing knowledge directly through expanded awareness it is given to Cult operatives by the secret society networks of the Cult where it has been passed on over thousands of years outside the public arena. Expanded realms of consciousness is where great artists, composers and writers find their inspiration and where truth awaits anyone open enough to connect with it. We need to go there fast. A

fiĜh of the Nag Hammadi texts describe the existence and manipulation of the Archons led by a 'Chief Archon' they call 'Yaldabaoth', or the 'Demiurge', and this is the Christian 'Devil', 'Satan', 'Lucifer', and his demons. Archons in Biblical symbolism are the 'fallen ones' which are also referred to as fallen angels aĜer the angels expelled from heaven according to the Abrahamic religions of Judaism, Christianity and Islam. These angels are claimed to tempt humans to 'sin' ongoing and you will see how accurate that symbolism is during the rest of the book. The theme of 'original sin' is related to the 'Fall' when Adam and Eve were 'tempted by the serpent' and fell from a state of innocence and 'obedience' (connection) with God into a state of disobedience (disconnection). The Fall is said to have brought sin into the world and corrupted everything including human nature. Yaldabaoth, the 'Lord Archon', is described by Gnostics as a 'counterfeit spirit', 'The Blind One', 'The Blind God', and 'The Foolish One'. The Jewish name for Yaldabaoth in Talmudic writings is Samael which translates as 'Poison of God', or 'Blindness of God'. You see the parallels. Yaldabaoth in Islamic belief is the Muslim Jinn devil known as Shaytan – Shaytan is Satan as the same themes are found all over the world in every religion and culture. The 'Lord God' of the Old Testament is the 'Lord Archon' of Gnostic manuscripts and that's why he's such a bloodthirsty bastard. Satan is known by Christians as 'the Demon of Demons' and Gnostics called Yaldabaoth the 'Archon of Archons'. Both are known as 'The Deceiver'. We are talking about the same 'bloke' for sure and these common themes using different names, storylines and symbolism tell a common tale of the human plight. Archons are referred to in Nag Hammadi documents as mind parasites, inverters, guards, gatekeepers, detainers, judges, pitiless ones and deceivers. The 'Covid' hoax alone is a glaring example of all these things. The Biblical 'God' is so different in the Old and New Testaments because they are not describing the same phenomenon. The vindictive, angry, hate-filled, 'God' of the Old Testament, known as Yahweh, is Yaldabaoth who is depicted in Cult-dictated popular culture as the 'Dark Lord', 'Lord of Time', Lord (Darth) Vader and Dormammu, the evil ruler of the 'Dark Dimension' trying to take over the 'Earth Dimension' in the Marvel comic movie, Dr Strange. Yaldabaoth is both the Old Testament 'god' and the Biblical 'Satan'. Gnostics referred to

Yaldabaoth as the 'Great Architect of the Universe' and the Cult-controlled Freemason network calls their god 'the 'Great Architect of the Universe' (also Grand Architect). The 'Great Architect' Yaldabaoth is symbolised by the Cult as the all-seeing eye at the top of the pyramid on the Great Seal of the United States and the dollar bill. Archon is encoded in arch-itect as it is in arch-angels and arch-bishops. All religions have the theme of a force for good and force for evil in some sort of spiritual war and there is a reason for that – the theme is true. The Cult and its non-human masters are quite happy for this to circulate. They present themselves as the force for good fighting evil when they are really the force of evil (absence of love). The whole foundation of Cult modus operandi is inversion. They promote themselves as a force for good and anyone challenging them in pursuit of peace, love, fairness, truth and justice is condemned as a satanic force for evil. This has been the game plan throughout history whether the Church of Rome inquisitions of non-believers or 'conspiracy theorists' and 'anti-vaxxers' of today. The technique is the same whatever the Yaldabaoth is revolting (true) Yaldabaoth and the Archons are said to have revolted against God with Yaldabaoth claiming to be God – the All That Is. The Old Testament 'God' (Yaldabaoth) demanded to be worshipped as such: 'I am the LORD, and there is none else, there is no God beside me' (Isaiah 45:5). I have quoted in other books a man who said he was the unofficial son of the late Baron Philippe de Rothschild of the Mouton-Rothschild wine producing estates in France who died in 1988 and he told me about the Rothschild 'revolt from God'. The man said he was given the name Phillip Eugene de Rothschild and we shared long correspondence many years ago while he was living under another identity. He said that he was conceived through 'occult incest' which (within the Cult) was 'normal and to be admired'. 'Phillip' told me about his experience attending satanic rituals with rich and famous people whom he names and you can see them and the wider background to Cult Satanism in my other books starting with The Biggest Secret. Cult rituals are interactions with Archontic 'gods'. 'Phillip' described Baron Philippe de Rothschild as 'a master Satanist and hater of God' and he used the same term 'revolt from God' associated with Yaldabaoth/Satan/Lucifer/the Devil in describing the Sabbatian Rothschild dynasty. 'I

played a key role in my family's revolt from God', he said. That role was to infiltrate in classic Sabbatian style the Christian Church, but eventually he escaped the mind-prison to live another life. The Cult has been targeting religion in a plan to make worship of the Archons the global one-world religion. Infiltration of Satanism into modern 'culture', especially among the young, through music videos, stage shows and other means, is all part of Nag Hammadi texts describe Yaldabaoth and the Archons in their prime form as energy – consciousness – and say they can take form if they choose in the same way that consciousness takes form as a human. Yaldabaoth is called 'formless' and represents a deeply inverted, distorted and chaotic state of consciousness which seeks to attach to humans and turn them into a likeness of itself in an attempt at assimilation. For that to happen it has to manipulate humans into low frequency mental and emotional states that match its own. Archons can certainly appear in human form and this is the origin of the psychopathic personality. The energetic distortion Gnostics called Yaldabaoth is psychopathy. When psychopathic Archons take human form that human will be a psychopath as an expression of Yaldabaoth consciousness. Cult psychopaths are Archons in human form. The principle is the same as that portrayed in the 2009 Avatar movie when the American military travelled to a fictional Earth-like moon called Pandora in the Alpha Centauri star system to infiltrate a society of blue people, or Na'vi, by hiding within bodies that looked like the Na'vi. Archons posing as humans have a particular hybrid information field, part human, part Archon, (the ancient 'demigods') which processes information in a way that manifests behaviour to match their psychopathic evil, lack of empathy and compassion, and stops them being influenced by the empathy, compassion and love that a fully-human information field is capable of expressing. Cult bloodlines interbreed, be they royalty or dark suits, for this reason and you have their obsession with incest. Interbreeding with full-blown humans would dilute the Archontic energy field that guarantees psychopathy in its representatives in the human realm. Gnostic writings say the main non-human forms that Archons take are serpentine (what I have called for decades 'reptilian' amid unbounded ridicule from the Archontically-programmed) and what Gnostics describe as 'an unborn baby

or foetus with grey skin and dark, unmoving eyes'. This is an excellent representation of the ET 'Greys' of UFO folklore which large numbers of people claim to have seen and been abducted by – Zulu shaman Credo Mutwa among them. I agree with those that believe in extraterrestrial or interdimensional visitations today and for thousands of years past. No wonder with their advanced knowledge and technological capability they were perceived and worshipped as gods for technological and other 'miracles' they appeared to perform. Imagine someone arriving in a culture disconnected from the modern world with a smartphone and computer. They would be seen as a 'god' capable of 'miracles'. The Renegade Mind, however, wants to know the source of everything and not only the way that source manifests as human or non-human. In the same way that a Renegade Mind seeks the original source material for the 'Covid virus' to see if what is claimed is true. The original source of Archons in form is consciousness – the distorted state of consciousness known to Gnostics as Yaldabaoth. 'Revolt from God' is energetic disconnection. Where I am going next will make a lot of sense of religious texts and ancient legends relating to 'Satan', 'Lucifer' and the 'gods'. Gnostic descriptions sync perfectly with the themes of my own research over the years in how they describe a consciousness distortion seeking to impose itself on human consciousness. I've referred to the core of infinite awareness in previous books as Infinite Awareness in Awareness of Itself. By that I mean a level of awareness that knows that it is all awareness and is aware of all awareness. From here comes the frequency of love in its true sense and balance which is what love is on one level – the balance of all forces into a single whole called Oneness and Isness. The more we disconnect from this state of love that many call 'God' the constituent parts of that Oneness start to unravel and express themselves as a part and not a whole. They become individualised as intellect, mind, selfishness, hatred, envy, desire for power over others, and such like. This is not a problem in the greater scheme in that 'God', the All That Is, can experience all these possibilities through different expressions of itself including humans. What we as expressions of the whole experience the All That Is experiences. We are the All That Is experiencing itself. As we withdraw from that state of Oneness we disconnect from its

influence and things can get very unpleasant and very stupid. Archontic consciousness is at the extreme end of that. It has so disconnected from the influence of Oneness that it has become an inversion of unity and love, an inversion of everything, an inversion of life itself. Evil is appropriately live wriĝen backwards. Archontic consciousness is obsessed with death, an inversion of life, and so its manifestations in Satanism are obsessed with death. They use inverted symbols in their rituals such as the inverted pentagram and cross. Sabbatians as Archontic consciousness incarnate invert Judaism and every other religion and culture they infiltrate. They seek disunity and chaos and they fear unity and harmony as they fear love like garlic to a vampire. As a result the Cult, Archons incarnate, act with such evil, psychopathy and lack of empathy and compassion disconnected as they are from the source of love. How could Bill Gates and the rest of the Archontic psychopaths do what they have to human society in the 'Covid' era with all the death, suffering and destruction involved and have no emotional consequence for the impact on others? Now you know. Why have Zuckerberg, Brin, Page, Wojcicki and company callously censored information warning about the dangers of the 'vaccine' while thousands have been dying and having severe, sometimes life- changing reactions? Now you know. Why have Tedros, Fauci, Whiĝy, Vallance and their like around the world been using case and death figures they're aware are fraudulent to justify lockdowns and all the deaths and destroyed lives that have come from that? Now you know. Why did Christian Drosten produce and promote a 'testing' protocol that he knew couldn't test for infectious disease which led to a global human catastrophe. Now you know. The Archontic mind doesn't give a shit (Fig 17). I personally think that Gates and major Cult insiders are a form of AI cyborg that the Archons want humans to become. Figure 17: Artist Neil Hague's version of the 'Covid' hierarchy. A state of such inversion does have its consequences, however. The level of disconnection from the Source of All means that you withdraw from that source of energetic sustenance and creativity. This means that you have to find your own supply of energetic power and it has – us. When the Morpheus character in the first Matrix movie held up a baĝery he spoke a profound truth when he said: 'The Matrix is a computer-generated dream world

built to keep us under control in order to change the human being into one of these.' The statement was true in all respects. We do live in a technologically-generated virtual reality simulation (more very shortly) and we have been manipulated to be an energy source for Archontic consciousness. The Disney-Pixar animated movie Monsters, Inc. in 2001 symbolised the dynamic when monsters in their world had no energy source and they would enter the human world to terrify children in their beds, catch the child's scream, terror (low-vibrational frequencies), and take that energy back to power the monster world. The lead character you might remember was a single giant eye and the symbolism of the Cult's all-seeing eye was obvious. Every thought and emotion is broadcast as a frequency unique to that thought and emotion. Feelings of love and joy, empathy and compassion, are high, quick, frequencies while fear, depression, anxiety, suffering and hate are low, slow, dense frequencies. Which kind do you think Archontic consciousness can connect with and absorb? In such a low and dense frequency state there's no way it can connect with the energy of love and joy. Archons can only feed off energy compatible with their own frequency and they and their Cult agents want to delete the human world of love and joy and manipulate the transmission of low vibrational frequencies through low-vibrational human mental and emotional states. We are their energy source. Wars are energetic banquets to the Archons – a world war even more so – and think how much low-frequency mental and emotional energy has been generated from the consequences for humanity of the 'Covid' hoax orchestrated by Archons incarnate like Gates. The ancient practice of human sacrifice 'to the gods', continued in secret today by the Cult, is based on the same principle. 'The gods' are Archontic consciousness in different forms and the sacrifice is induced into a state of intense terror to generate the energy the Archontic frequency can absorb. Incarnate Archons in the ritual drink the blood which contains an adrenaline they crave which floods into the bloodstream when people are terrorised. Most of the sacrifices, ancient and modern, are children and the theme of 'sacrificing young virgins to the gods' is just code for children. They have a particular pre-puberty energy that Archons want more than anything and the energy of the young in general is their target. The California



Department of Education wants students to chant the names of Aztec gods (Archontic gods) once worshipped in human sacrifice rituals in a curriculum designed to encourage them to 'challenge racist, bigoted, discriminatory, imperialist/colonial beliefs', join 'social movements that struggle for social justice', and 'build new possibilities for a post-racist, post-systemic racism society'. It's the usual Woke crap that inverts racism and calls it anti-racism. In this case solidarity with 'indigenous tribes' is being used as an excuse to chant the names of 'gods' to which people were sacrificed (and still are in secret). What an example of Woke's inability to see beyond black and white, us and them, They condemn the colonisation of these tribal cultures by Europeans (quite right), but those cultures sacrificing people including children to their 'gods', and mass murdering untold numbers as the Aztecs did, is just fine. One chant is to the Aztec god Tezcatlipoca who had a man sacrificed to him in the 5th month of the Aztec calendar. His heart was cut out and he was eaten. Oh, that's okay then. Come on children ... after three ... Other sacrificial 'gods' for the young to chant their allegiance include Quetzalcoatl, Huitzilopochtli and Xipe Totec. The curriculum says that 'chants, affirmations, and energizers can be used to bring the class together, build unity around ethnic studies principles and values, and to reinvigorate the class following a lesson that may be emotionally taxing or even when student engagement may appear to be low'. Well, that's the cover story, anyway. Chanting and mantras are the repetition of a particular frequency generated from the vocal cords and chanting the names of these Archontic 'gods' tunes you into their frequency. That is the last thing you want when it allows for energetic synchronisation, attachment and perceptual influence. Initiates chant the names of their 'Gods' in their rituals for this very reason. Vampires of the Woke Paedophilia is another way that Archons absorb the energy of children. Paedophiles possessed by Archontic consciousness are used as the conduit during sexual abuse for discarnate Archons to vampire the energy of the young they desire so much. Stupendous numbers of children disappear every year never to be seen again although you would never know from the media. Imagine how much low-vibrational energy has been generated by children during the 'Covid' hoax when so many have become depressed and

psychologically destroyed to the point of killing themselves. Shocking numbers of children are now taken by the state from loving parents to be handed to others. I can tell you from long experience of researching this since 1996 that many end up with paedophiles and assets of the Cult through corrupt and Cult-owned social services which in the reframing era has hired many psychopaths and emotionless automatons to do the job. Children are even stolen to order using spurious reasons to take them by the corrupt and secret (because they're corrupt) 'family courts'. I have written in detail in other books, starting with *The Biggest Secret* in 1997, about the ubiquitous connections between the political, corporate, government, intelligence and military elites (Cult operatives) and Satanism and paedophilia. If you go deep enough both networks have an interlocking leadership. The Woke mentality has been developed by the Cult for many reasons: To promote almost every aspect of its agenda; to hijack the traditional political left and turn it fascist; to divide and rule; and to target agenda pushbackers. But there are other reasons which relate to what I am describing here. How many happy and joyful Wokers do you ever see especially at the extreme end? They are a mental and psychological mess consumed by emotional stress and constantly emotionally cocked for the next explosion of indignation at someone referring to a female as a female. They are walking, talking, batteries as Morpheus might say emitting frequencies which both enslave them in low-vibrational bubbles of perceptual limitation and feed the Archons. Add to this the hatred claimed to be love; fascism claimed to 'anti-fascism', racism claimed to be 'anti-racism'; exclusion claimed to inclusion; and the abuse-filled Internet trolling. You have a purpose-built Archontic energy system with not a wind turbine in sight and all founded on Archontic inversion. We have whole generations now manipulated to serve the Archons with their unless they snap out of their Archon-induced trance. Is it really a surprise that Cult billionaires and corporations put so much money their way? Where is the energy of joy and laughter, including laughing at yourself which is confirmation of your own emotional security? Mark Twain said: 'The human race has one really effective weapon, and that is laughter.' We must use it all the time. Woke has destroyed comedy because it has no humour, no joy, sense of irony, or

self-deprecation. Its energy is dense and intense. Mmmmm, lunch says the Archontic frequency. Rudolf Steiner (1861-1925) was the Austrian philosopher and famous esoteric thinker who established Waldorf education or Steiner schools to treat children like unique expressions of consciousness and not minds to be programmed with the perceptions determined by authority. I'd been writing about this energy vampiring for decades when I was sent in 2016 a quote by Steiner. He was spot on: There are beings in the spiritual realms for whom anxiety and fear emanating from human beings offer welcome food. When humans have no anxiety and fear, then these creatures starve. If fear and anxiety radiates from people and they break out in panic, then these creatures find welcome nutrition and they become more and more powerful. These beings are hostile towards humanity. Everything that feeds on negative feelings, on anxiety, fear and superstition, despair or doubt, are in reality hostile forces in super-sensible worlds, launching cruel attacks on human beings, while they are being fed ... These are exactly the feelings that belong to contemporary culture and materialism; because it estranges people from the spiritual world, it is especially suited to evoke hopelessness and fear of the unknown in people, thereby calling up the above mentioned hostile forces against them. Pause for a moment from this perspective and reflect on what has happened in the world since the start of 2020. Not only will pennies drop, but billion dollar bills. We see the same theme from Don Juan Matus, a Yaqui Indian shaman in Mexico and the information source for Peruvian-born writer, Carlos Castaneda, who wrote a series of books from the 1960s to 1990s. Don Juan described the force manipulating human society and his name for the Archons was the We have a predator that came from the depths of the cosmos and took over the rule of our lives. Human beings are its prisoners. The predator is our lord and master. It has rendered us docile, helpless. If we want to protest, it suppresses our protest. If we want to act independently, it demands that we don't do so ... indeed we are held prisoner! They took us over because we are food to them, and they squeeze us mercilessly because we are their sustenance. Just as we rear chickens in coops, the predators rear us in human coops, humaneros. Therefore, their food is always available to

them. Different cultures, different eras, same recurring theme. The 'ennoia' dilemma Nag Hammadi Gnostic manuscripts say that Archon consciousness has no 'ennoia'. This is directly translated as 'intentionality', but I'll use the term 'creative imagination'. The All That Is in awareness of itself is the source of all creativity – all possibility – and the more disconnected you are from that source the more you are subsequently denied 'creative imagination'. Given that Archon consciousness is almost entirely disconnected it severely lacks creativity and has to rely on far more mechanical processes of thought and exploit the creative potential of those that do have 'ennoia'. You can see cases of this throughout human society. Archon consciousness almost entirely dominates the global banking system and if we study how that system works you will appreciate what I mean. Banks manifest 'money' out of nothing by issuing lines of 'credit' which is 'money' that has never, does not, and will never exist except in theory. It's a confidence trick. If you think 'credit' figures-on-a-screen 'money' is worth anything you accept it as payment. If you don't then the whole system collapses through lack of confidence in the value of that 'money'. Archontic bankers with no 'ennoia' are 'lending' 'money' that doesn't exist to humans that do have creativity – those that have the inspired ideas and create businesses and products. Archon banking feeds off human creativity which it controls through 'money' creation and debt. Humans have the creativity and Archons exploit that for their own benefit and control while having none themselves. Archon Internet platforms post and while Archontic minds like Zuckerberg may officially head that company it will be human creatives on the staff that provide the creative inspiration. When you have limitless 'money' you can then buy other companies established by creative humans. Witness the acquisition record of Facebook, Google and their like. Survey the Archon-controlled music industry and you see non-creative dark suit executives making their fortune from the human creativity of their artists. The cases are endless. Research the history of people like Gates and Zuckerberg and how their empires were built on exploiting the creativity of others. Archon minds cannot create out of nothing, but they are skilled (because they have to be) in what Gnostic texts call 'countermimicry'. They can imitate, but not innovate. Sabbatians trawl the

creativity of others through backdoors they install in computer systems through their cybersecurity systems. Archon-controlled China is globally infamous for stealing intellectual property and I remember how Hong Kong, now part of China, became notorious for making counterfeit copies of the creativity of others – ‘countermimicry’. With the now pervasive and all-seeing surveillance systems able to infiltrate any computer you can appreciate the potential for Archons to vampire the creativity of humans. Author John Lamb Lash wrote in his book about the Nag Hammadi texts, *Not In His Image*: Although they cannot originate anything, because they lack the divine factor of *ennoia* (intentionality), Archons can imitate with a vengeance. Their expertise is simulation (HAL, virtual reality). The Demiurge [Yaldabaoth] fashions a heaven world copied from the fractal patterns [of the original] ... His construction is celestial kitsch, like the fake Italianate villa of a Mafia don complete with militant angels to guard every portal. This brings us to something that I have been speaking about since the turn of the millennium. Our reality is a simulation; a virtual reality that we think is real. No, I’m not kidding. Human reality? Well, virtually I had pondered for years about whether our reality is ‘real’ or some kind of construct. I remembered being immensely affected on a visit as a small child in the late 1950s to the then newly-opened Planetarium on the Marylebone Road in London which is now closed and part of the adjacent Madame Tussauds wax museum. It was in the middle of the day, but when the lights went out there was the night sky projected in the Planetarium’s domed ceiling and it appeared to be so real. The experience never left me and I didn’t know why until around the turn of the millennium when I became certain that our ‘night sky’ and entire reality is a projection, a virtual reality, akin to the illusory world portrayed in the Matrix movies. I looked at the sky one day in this period and it appeared to me like the domed roof of the Planetarium. The release of the first Matrix movie in 1999 also provided a synchronistic and perfect visual representation of where my mind had been going for a long time. I hadn’t come across the Gnostic Nag Hammadi texts then. When I did years later the correlation was once again astounding. As I read Gnostic accounts from 1,600 years and more earlier it was clear that they were describing the same simulation phenomenon. They tell how

the Yaldabaoth 'Demiurge' and Archons created a 'bad copy' of original reality to rule over all that were captured by its illusions and the body was a prison to trap consciousness in the 'bad copy' fake reality. Read how Gnostics describe the 'bad copy' and update that to current times and they are referring to what we would call today a virtual reality simulation. Author John Lamb Lash said 'the Demiurge fashions a heaven world copied from the fractal paĵerns' of the original through expertise in 'HAL' or virtual reality simulation. Fractal paĵerns are part of the energetic information construct of our reality, a sort of blueprint. If these paĵerns were copied in computer terms it would indeed give you a copy of a 'natural' reality in a non-natural frequency and digital form. The principle is the same as making a copy of a website. The original website still exists, but now you can change the copy version to make it whatever you like and it can become very different to the original website. Archons have done this with our reality, a synthetic copy of prime reality that still exists beyond the frequency walls of the simulation. Trapped within the illusions of this synthetic Matrix, however, were and are human consciousness and other expressions of prime reality and this is why the Archons via the Cult are seeking to make the human body synthetic and give us synthetic AI minds to complete the job of turning the entire reality synthetic including what we perceive to be the natural world. To quote Kurzweil: 'Nanobots will infuse all the maĵer around us with information. Rocks, trees, everything will become these intelligent creatures.' Yes, synthetic 'creatures' just as 'Covid' and other genetically-manipulating 'vaccines' are designed to make the human body synthetic. From this perspective it is obvious why Archons and their Cult are so desperate to infuse synthetic material into every human with their 'Covid' scam. Let there be (electromagnetic) light Yaldabaoth, the force that created the simulation, or Matrix, makes sense of the Gnostic reference to 'The Great Architect' and its use by Cult Freemasonry as the name of its deity. The designer of the Matrix in the movies is called 'The Architect' and that trilogy is jam-packed with symbolism relating to these subjects. I have contended for years that the angry Old Testament God (Yaldabaoth) is the 'God' being symbolically 'quoted' in the opening of Genesis as 'creating the world'. This is not the creation of prime reality – it's the

creation of the simulation. The Genesis 'God' says: 'Let there be Light: and there was light.' But what is this 'Light'? I have said for decades that the speed of light (186,000 miles per second) is not the fastest speed possible as claimed by mainstream science and is in fact the frequency walls or outer limits of the Matrix. You can't have a fastest or slowest anything within all possibility when everything is possible. The human body is encoded to operate within the speed of light or within the simulation and thus we see only the tiny frequency band of visible light. Near-death experiencers who perceive reality outside the body during temporary 'death' describe a very different form of light and this is supported by the Nag Hammadi texts. Prime reality beyond the simulation ('Upper Aeons' to the Gnostics) is described as a realm of incredible beauty, bliss, love and harmony – a realm of 'watery light' that is so powerful 'there are no shadows'. Our false reality of Archon control, which Gnostics call the 'Lower Aeons', is depicted as a realm with a different kind of 'light' and described in terms of chaos, 'Hell', 'the Abyss' and 'Outer Darkness', where trapped souls are tormented and manipulated by demons (relate that to the 'Covid' hoax alone). The watery light theme can be found in near-death accounts and it is not the same as simulation 'light' which is electromagnetic or radiation light within the speed of light – the 'Lower Aeons'. Simulation 'light' is the 'luminous fire' associated by Gnostics with the Archons. The Bible refers to Yaldabaoth as 'that old serpent, called the Devil, and Satan, which deceiveth the whole world' (Revelation 12:9). I think that making a simulated copy of prime reality ('countermimicry') and changing it dramatically while all the time manipulating humanity to believe it to be real could probably meet the criteria of deceiving the whole world. Then we come to the Cult god Lucifer – the Light Bringer. Lucifer is symbolic of Yaldabaoth, the bringer of radiation light that forms the bad copy simulation within the speed of light. 'He' is symbolised by the lighted torch held by the Statue of Liberty and in the name 'Illuminati'. Sabbatian-Frankism declares that Lucifer is the true god and Lucifer is the real god of Freemasonry honoured as their 'Great or Grand Architect of the Universe' (simulation). I would emphasise, too, the way Archontic technologically- generated luminous fire of radiation has deluged our environment since I was a kid in the 1950s and

changed the nature of The Field with which we constantly interact. Through that interaction technological radiation is changing us. The Smart Grid is designed to operate with immense levels of communication power with 5G expanding across the world and 6G, 7G, in the process of development. Radiation is the simulation and the Archontic manipulation system. Why wouldn't the Archon Cult wish to unleash radiation upon us to an ever-greater extreme to form Kurzweil's 'cloud'? The plan for a synthetic human is related to the need to cope with levels of radiation beyond even anything we've seen so far. Biological humans would not survive the scale of radiation they have in their script. The Smart Grid is a technological sub-reality within the technological simulation to further disconnect five-sense perception from expanded consciousness. It's a technological prison of the mind. Infusing the 'spirit of darkness' A recurring theme in religion and native cultures is the manipulation of human genetics by a non-human force and most famously recorded as the biblical 'sons of god' (the gods plural in the original) who interbred with the daughters of men. The Nag Hammadi Apocryphon of John tells the same story this way: He [Yaldabaoth] sent his angels [Archons/demons] to the daughters of men, that they might take some of them for themselves and raise offspring for their enjoyment. And at first they did not succeed. When they had no success, they gathered together again and they made a plan together ... And the angels changed themselves in their likeness into the likeness of their mates, filling them with the spirit of darkness, which they had mixed for them, and with evil ... And they took women and begot children out of the darkness according to the likeness of Possession when a discarnate entity takes over a human body is an age-old theme and continues today. It's very real and I've seen it. Satanic and secret society rituals can create an energetic environment in which entities can aĵach to initiates and I've heard many stories of how people have changed their personality aĜer being initiated even into lower levels of the Freemasons. I have been inside three Freemasonic temples, one at a public open day and two by just walking in when there was no one around to stop me. They were in Ryde, the town where I live, Birmingham, England, when I was with a group, and Boston, MassachuseĴs. They all felt the same



energetically – dark, dense, low-vibrational and sinister. Demonic aĵachment can happen while the initiate has no idea what is going on. To them it's just a ritual to get in the Masons and do a bit of good business. In the far more extreme rituals of Satanism human possession is even more powerful and they are designed to make possession possible. The hierarchy of the Cult is dictated by the power and perceived status of the possessing Archon. In this way the Archon hierarchy becomes the Cult hierarchy. Once the entity has aĵached it can influence perception and behaviour and if it aĵaches to the extreme then so much of its energy (information) infuses into the body information field that the hologram starts to reflect the nature of the possessing entity. This is the Exorcist movie type of possession when facial features change and it's known as shapeshiĜing. Islam's Jinn are said to be invisible tricksters who change shape, 'whisper', confuse and take human form. These are all traits of the Archons and other versions of the same phenomenon. Extreme possession could certainly infuse the 'spirit of darkness' into a partner during sex as the Nag Hammadi texts appear to describe. Such an infusion can change genetics which is also energetic information. Human genetics is information and the 'spirit of darkness' is information. Mix one with the other and change must happen. Islam has the concept of a 'Jinn baby' through possession of the mother and by Jinn taking human form. There are many ways that human genetics can be changed and remember that Archons have been aware all along of advanced techniques to do this. What is being done in human society today – and far more – was known about by Archons at the time of the 'fallen ones' and their other versions described in religions and cultures. Archons and their human-world Cult are obsessed with genetics as we see today and they know this dictates how information is processed into perceived reality during a human life. They needed to produce a human form that would decode the simulation and this is symbolically known as 'Adam and Eve' who leĜ the 'garden' (prime reality) and 'fell' into Matrix reality. The simulation is not a 'physical' construct (there is no 'physical'); it is a source of information. Think Wi-Fi again. The simulation is an energetic field encoded with information and body-brain systems are designed to decode that information encoded in wave or frequency form which is

transmitted to the brain as electrical signals. These are decoded by the brain to construct our sense of reality – an illusory ‘physical’ world that only exists in the brain or the mind. Virtual reality games mimic this process using the same sensory decoding system. Information is fed to the senses to decode a virtual reality that can appear so real, but isn’t (Figs 18 and 19). Some scientists believe – and I agree with them – that what we perceive as ‘physical’ reality only exists when we are looking or observing. The act of perception or focus triggers the decoding systems which turn waveform information into holographic reality. When we are not observing something our reality reverts from a holographic state to a waveform state. This relates to the same principle as a falling tree not making a noise unless someone is there to hear it or decode it. The concept makes sense from the simulation perspective. A computer is not decoding all the information in a Wi-Fi field all the time and only decodes or brings into reality on the screen that part of Wi-Fi that it’s decoding – focusing upon – at that moment. Figure 18: Virtual reality technology ‘hacks’ into the body’s five-sense decoding system. Figure 19: The result can be experienced as very ‘real’. Interestingly, Professor Donald Hoffman at the Department of Cognitive Sciences at the University of California, Irvine, says that our experienced reality is like a computer interface that shows us only the level with which we interact while hiding all that exists beyond it: ‘Evolution shaped us with a user interface that hides the truth. Nothing that we see is the truth – the very language of space and time and objects is the wrong language to describe reality.’ He is correct in what he says on so many levels. Space and time are not a universal reality. They are a phenomenon of decoded simulation reality as part of the process of enslaving our sense of reality. Near-death experiencers report again and again how space and time did not exist as we perceive them once they were free of the body – body decoding systems. You can appreciate from this why Archons and their Cult are so desperate to entrap human attention in the five senses where we are in the Matrix and of the Matrix. Opening your mind to expanded states of awareness takes you beyond the information confines of the simulation and you become aware of knowledge and insights denied to you before. This is what we call ‘awakening’ – awakening from the

Matrix – and in the final chapter I will relate this to current events. Where are the ‘aliens’? A simulation would explain the so-called ‘Fermi Paradox’ named after Italian physicist Enrico Fermi (1901-1954) who created the first nuclear reactor. He considered the question of why there is such a lack of extraterrestrial activity when there are so many stars and planets in an apparently vast universe; but what if the night sky that we see, or think we do, is a simulated projection as I say? If you control the simulation and your aim is to hold humanity fast in essential ignorance would you want other forms of life including advanced life coming and going sharing information with humanity? Or would you want them to believe they were isolated and apparently alone? Themes of human isolation and apartness are common whether they be the perception of a lifeless universe or the fascist isolation laws of the ‘Covid’ era. Paradoxically the very existence of a simulation means that we are not alone when some force had to construct it. My view is that experiences that people have reported all over the world for centuries with Reptilians and Grey entities are Archon phenomena as Nag Hammadi texts describe; and that benevolent ‘alien’ interactions are non-human groups that come in and out of the simulation by overcoming Archon attempts to keep them out. It should be highlighted, too, that Reptilians and Greys are obsessed with genetics and technology as related by cultural accounts and those who say they have been abducted by them. Technology is their way of overcoming some of the limitations in their creative potential and our technology-driven and controlled human society of today is archetypical Archon-Reptilian-Grey modus operandi. Technocracy is really Archontocracy. The Universe does not have to be as big as it appears with a simulation. There is no space or distance only information decoded into holographic reality. What we call ‘space’ is only the absence of holographic ‘objects’ and that ‘space’ is The Field of energetic information which connects everything into a single whole. The same applies with the artificially-generated information field of the simulation. The Universe is not big or small as a physical reality. It is decoded information, that’s all, and its perceived size is decided by the way the simulation is encoded to make it appear. The entire night sky as we perceive it only exists in our brain and so where are

those 'millions of light years'? The 'stars' on the ceiling of the Planetarium looked a vast distance away. There's another point to mention about 'aliens'. I have been highlighting since the 1990s the plan to stage a fake 'alien invasion' to justify the centralisation of global power and a world military. Nazi scientist Werner von Braun, who was taken to America by Operation Paperclip after World War Two to help found NASA, told his American assistant Dr Carol Rosin about the Cult agenda when he knew he was dying in 1977. Rosin said that he told her about a sequence that would lead to total human control by a one-world government. This included threats from terrorism, rogue nations, meteors and asteroids before finally an 'alien invasion'. All of these things, von Braun said, would be bogus and what I would refer to as a No-Problem-Reaction-Solution. Keep this in mind when 'the aliens are coming' is the new mantra. The aliens are not coming – they are already here and they have infiltrated human society while looking human. French-Canadian investigative journalist Serge Monast said in 1994 that he had uncovered a NASA/military operation called Project Blue Beam which fits with what Werner von Braun predicted. Monast died of a 'heart attack' in 1996 the day after he was arrested and spent a night in prison. He was 51. He said Blue Beam was a plan to stage an alien invasion that would include religious figures beamed holographically into the sky as part of a global manipulation to usher in a 'new age' of worshipping what I would say is the Cult 'god' Yaldabaoth in a one-world religion. Fake holographic asteroids are also said to be part of the plan which again syncs with von Braun. How could you stage an illusory threat from asteroids unless they were holographic inserts? This is pretty straightforward given the advanced technology outside the public arena and the fact that our 'physical' reality is holographic anyway. Information fields would be projected and we would decode them into the illusion of a 'physical' asteroid. If they can sell a global 'pandemic' with a 'virus' that doesn't exist what will humans not believe if government and media tell them? All this is particularly relevant as I write with the Pentagon planning to release in June, 2021, information about 'UFO sightings'. I have been following the UFO story since the early 1990s and the common theme throughout has been government and military denials and cover up. More recently,

however, the Pentagon has suddenly become more talkative and apparently open with Air Force pilot radar images released of unexplained craft moving and changing direction at speeds well beyond anything believed possible with human technology. Then, in March, 2021, former Director of National Intelligence John Ratcliffe said a Pentagon report months later in June would reveal a great deal of information about UFO sightings unknown to the public. He said the report would have 'massive implications'. The order to do this was included bizarrely in a \$2.3 trillion 'coronavirus' relief and government funding bill passed by the Trump administration at the end of 2020. I would add some serious notes of caution here. I have been pointing out since the 1990s that the US military and intelligence networks have long had craft – 'flying saucers' or anti-gravity craft – which any observer would take to be extraterrestrial in origin. Keeping this knowledge from the public allows craft flown by humans to be perceived as alien visitations. I am not saying that 'aliens' do not exist. I would be the last one to say that, but we have to be streetwise here. President Ronald Reagan told the UN General Assembly in 1987: 'I occasionally think how quickly our differences worldwide would vanish if we were facing an alien threat from outside this world.' That's the idea. Unite against a common 'enemy' with a common purpose behind your 'saviour force' (the Cult) as this age-old technique of mass manipulation goes global. Science moves this way ... I could find only one other person who was discussing the simulation hypothesis publicly when I concluded it was real. This was Nick Bostrom, a Swedish-born philosopher at the University of Oxford, who has explored for many years the possibility that human reality is a computer simulation although his version and mine are not the same. Today the simulation and holographic reality hypothesis have increasingly entered the scientific mainstream. Well, the more open-minded mainstream, that is. Here are a few of the ever-gathering examples. American nuclear physicist Silas Beane led a team of physicists at the University of Bonn in Germany pursuing the question of whether we live in a simulation. They concluded that we probably do and it was likely based on a lattice of cubes. They found that cosmic rays align with that specific pattern. The team highlighted the Greisen-Zatsepin-Kuzmin (GZK) limit which

refers to cosmic ray particle interaction with cosmic background radiation that creates an apparent boundary for cosmic ray particles. They say in a paper entitled 'Constraints on the Universe as a Numerical Simulation' that this 'pattern of constraint' is exactly what you would find with a computer simulation. They also made the point that a simulation would create its own 'laws of physics' that would limit possibility. I've been making the same point for decades that the perceived laws of physics relate only to this reality, or what I would later call the simulation. When designers write codes to create computer and virtual reality games they are the equivalent of the laws of physics for that game. Players interact within the limitations laid out by the coding. In the same way those who wrote the codes for the simulation decided the laws of physics that would apply. These can be overridden by expanded states of consciousness, but not by those enslaved in only five-sense awareness where simulation codes rule. Overriding the codes is what people call 'miracles'. They are not. They are bypassing the encoded limits of the simulation. A population caught in simulation perception would have no idea that this was their plight. As the Bonn paper said: 'Like a prisoner in a pitch-black cell we would not be able to see the "walls" of our prison,' That's true if people remain mesmerised by the five senses. Open to expanded awareness and those walls become very clear. The main one is the speed of light. American theoretical physicist James Gates is another who has explored the simulation question and found considerable evidence to support the idea. Gates was Professor of Physics at the University of Maryland, Director of The Center for String and Particle Theory, and on Barack Obama's Council of Advisors on Science and Technology. He and his team found computer codes of digital data embedded in the fabric of our reality. They relate to on-off electrical charges of 1 and 0 in the binary system used by computers. 'We have the energetic fabric mathematical sequences known as error-correcting codes or block codes that 'reboot' data to its original state or 'default settings' when something knocks it out of sync. Gates was asked if he had found a set of equations embedded in our reality indistinguishable from those that drive search engines and browsers and he said: 'That is correct.' Rich Terrile, director of the Centre for Evolutionary Computation

and Automated Design at NASA's Jet Propulsion Laboratory, has said publicly that he believes the Universe is a digital hologram that must have been created by a form of intelligence. I agree with that in every way. Waveform information is delivered electrically by the senses to the brain which constructs a digital holographic reality that we call the 'world'. This digital level of reality can be read by the esoteric art of numerology. Digital holograms are at the cutting edge of holographics today. We have digital technology everywhere designed to access and manipulate our digital level of perceived reality. Synthetic mRNA in 'Covid vaccines' has a digital component to manipulate the body's digital Reality is numbers How many know that our reality can be broken down to numbers and codes that are the same as computer games? Max Tegmark, a physicist at the Massachusetts Institute of Technology (MIT), is the author of Our Mathematical Universe in which he lays out how reality can be entirely described by numbers and maths in the way that a video game is encoded with the 'physics' of computer games. Our world and computer virtual reality are essentially the same. Tegmark imagines the perceptions of characters in an advanced computer game when the graphics are so good they don't know they are in a game. They think they can bump into real objects (electromagnetic resistance in our reality), fall in love and feel emotions like excitement. When they began to study the apparently 'physical world' of the video game they would realise that everything was made of pixels (which have been found in our energetic reality as must be the case when on one level our world is digital). What computer game characters thought was physical 'stuff', Tegmark said, could actually be broken down into numbers: And we're exactly in this situation in our world. We look around and it doesn't seem that mathematical at all, but everything we see is made out of elementary particles like quarks and electrons. And what properties does an electron have? Does it have a smell or a colour or a texture? No! ... We physicists have come up with geeky names for [Electron] properties, like electric charge, or spin, or lepton number, but the electron doesn't care what we call it, the properties are just numbers. This is the illusory reality Gnostics were describing. This is the simulation. The A, C, G, and T codes of DNA have a binary value – A and C = 0 while G and T = 1. This has to be when the simulation is

digital and the body must be digital to interact with it. Recurring mathematical sequences are encoded throughout reality and the body. They include the Fibonacci sequence in which the two previous numbers are added to get the next one, as in ... 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, etc. The sequence is encoded in the human face and body, proportions of animals, DNA, seed heads, pine cones, trees, shells, spiral galaxies, hurricanes and the number of petals in a flower. The list goes on and on. There are fractal patterns – a 'never- ending pattern that is infinitely complex and self-similar across all scales in the as above, so below, principle of holograms. These and other famous recurring geometrical and mathematical sequences such as Phi, Pi, Golden Mean, Golden Ratio and Golden Section are computer codes of the simulation. I had to laugh and give my head a shake the day I finished this book and it went into the production stage. I was sent an article in Scientific American published in April, 2021, with the headline 'Confirmed! We Live in a Simulation'. Two decades after I first said our reality is a simulation and the speed of light is its outer limit the article suggested that we do live in a simulation and that the speed of light is its outer limit. I left school at 15 and never passed a major exam in my life while the writer was up to his eyes in qualifications. As I will explain in the final chapter knowing is far better than thinking and they come from very different sources. The article rightly connected the speed of light to the processing speed of the 'Matrix' and said what has been in my books all this time ... 'If we are in a simulation, as it appears, then space is an abstract property written in code. It is not real'. No it's not and if we live in a simulation something created it and it wasn't us. 'That David Icke says we are manipulated by aliens' – he's crackers.' The reality that humanity thinks is so real is an illusion. Politicians, governments, scientists, doctors, academics, law enforcement, media, school and university curriculums, on and on, are all founded on a world that does not exist except as a simulated prison cell. Is it such a stretch to accept that 'Covid' doesn't exist when our entire 'physical' reality doesn't exist? Revealed here is the knowledge kept under wraps in the Cult networks of compartmentalised secrecy to control humanity's sense of reality by inducing the population to believe in a reality that's not real. If it wasn't so tragic in its experiential consequences the



whole thing would be hysterically funny. None of this is new to Renegade Minds. Ancient Greek philosopher Plato (about 428 to about 347BC) was a major influence on Gnostic belief and he described the human plight thousands of years ago with his Allegory of the Cave. He told the symbolic story of prisoners living in a cave who had never been outside. They were chained and could only see one wall of the cave while behind them was a fire that they could not see. Figures walked past the fire casting shadows on the prisoners' wall and those moving shadows became their sense of reality. Some prisoners began to study the shadows and were considered experts on them (today's academics and scientists), but what they studied was only an illusion (today's academics and scientists). A prisoner escaped from the cave and saw reality as it really is. When he returned to report this revelation they didn't believe him, called him mad and threatened to kill him if he tried to set them free. Plato's tale is not only a brilliant analogy of the human plight and our illusory reality. It describes, too, the dynamics of the 'Covid' hoax. I have only skimmed the surface of these subjects here. The aim of this book is to crisply connect all essential dots to put what is happening today into its true context. All subject areas and their connections in this chapter are covered in great evidential detail in Everything You Need To Know, But Have Never Been Told and The Answer. They say that bewildered people 'can't see the forest for the trees'. Humanity, however, can't see the forest for the twigs. The five senses see only twigs while Renegade Minds can see the forest and it's the forest where the answers lie with the connections that reveals. Breaking free of perceptual programming so the forest can be seen is the way we turn all this around. Not breaking free is how humanity got into this mess. The situation may seem hopeless, but I promise you it's not. We are a perceptual heartbeat from paradise if only we Life is simply a vacation from the infinite enegade Minds weave the web of life and events and see common themes in the apparently random. They are always there if you look for them and their pursuit is aided by incredible synchronicity that comes when your mind is open rather than mesmerised by what it thinks it can see. Infinite awareness is infinite possibility and the more of infinite possibility that we access the more becomes infinitely possible. That may be stating the apparently

obvious, but it is a devastatingly- powerful fact that can set us free. We are a point of attention within an infinity of consciousness. The question is how much of that infinity do we choose to access? How much knowledge, insight, awareness, wisdom, do we want to connect with and explore? If your focus is only in the five senses you will be influenced by a fraction of infinite awareness. I mean a range so tiny that it gives new meaning to infinitesimal. Limitation of self-identity and a sense of the possible limit accordingly your range of consciousness. We are what we think we are. Life is what we think it is. The dream is the dreamer and the dreamer is the dream. Buddhist philosophy puts it this way: 'As a thing is viewed, so it appears.' Most humans live in the realm of touch, taste, see, hear, and smell and that's the limit of their sense of the possible and sense of self. Many will follow a religion and speak of a God in his heaven, but their lives are still dominated by the five senses in their perceptions and actions. The five senses become the arbiter of everything. When that happens all except a smear of infinity is sealed away from influence by the rigid, unyielding, reality bubbles that are the five-sense human or Phantom Self. Archon Cult methodology is to isolate consciousness within five-sense reality – the simulation – and then program that consciousness with a sense of self and the world through a deluge of life-long information designed to instill the desired perception that allows global control. Efforts to do this have increased dramatically with identity politics as identity bubbles are squeezed into the minutiae of five-sense detail which disconnect people even more profoundly from the infinite 'I'. Five-sense focus and self-identity are like a firewall that limits access to the infinite realms. You only perceive one radio or television station and no other. We'll take that literally for a moment. Imagine a vast array of stations giving different information and angles on reality, but you only ever listen to one. Here we have the human plight in which the population is overwhelmingly confined to CultFM. This relates only to the frequency range of CultFM and limits perception and insight to that band – limits possibility to that band. It means you are connecting with an almost imperceptibly minuscule range of possibility and creative potential within the infinite Field. It's a world where everything seems apart from everything else and where synchronicity is rare.

Synchronicity is defined in the dictionary as 'the happening by chance of two or more related or similar events at the same time'. Use of 'by chance' betrays a complete misunderstanding of reality. Synchronicity is not 'by chance'. As people open their minds, or 'awaken' to use the term, they notice more and more coincidences in their lives, bits of 'luck', apparently miraculous happenings that put them in the right place at the right time with the right people. Days become peppered with 'fancy meeting you here' and 'what are the chances of that?' My entire life has been lived like this and ever more so since my own colossal awakening in 1990 and 91 which transformed my sense of reality. Synchronicity is not 'by chance'; it is by accessing expanded realms of possibility which allow expanded potential for manifestation. People broadcasting the same vibe from the same openness of mind tend to be drawn 'by chance' to each other through what I call frequency magnetism and it's not only people. In the last more than 30 years incredible synchronicity has also led me through the Cult maze to information in so many forms and to crucial personal experiences. These 'coincidences' have allowed me to put the puzzle pieces together across an enormous array of subjects and situations. Those who have breached the bubble of five- sense reality will know exactly what I mean and this escape from the perceptual prison cell is open to everyone whenever they make that choice. This may appear super-human when compared with the limitations of 'human', but it's really our natural state. 'Human' as currently experienced is consciousness in an unnatural state of induced separation from the infinity of the whole. I'll come to how this transformation into unity can be made when I have described in more detail the force that holds humanity in servitude by denying this access to infinite self. The Wetiko factor I have been talking and writing for decades about the way five-sense mind is systematically barricaded from expanded awareness. I have used the analogy of a computer (five-sense mind) and someone at the keyboard (expanded awareness). Interaction between the computer and the operator is symbolic of the interaction between five-sense mind and expanded awareness. The computer directly experiences the Internet and the operator experiences the Internet via the computer which is how it's supposed to be – the two working

as one. Archons seek to control that point where the operator connects with the computer to stop that interaction (Fig 20). Now the operator is banging the keyboard and clicking the mouse, but the computer is not responding and this happens when the computer is taken over – possessed – by an appropriately-named computer ‘virus’. The operator has lost all influence over the computer which goes its own way making decisions under the control of the ‘virus’. I have just described the dynamic through which the force known to Gnostics as Yaldabaoth and Archons disconnects five-sense mind from expanded awareness to imprison humanity in perceptual Figure 20: The mind ‘virus’ I have been writing about for decades seeks to isolate five-sense mind (the computer) from the true ‘I’. (Image by Neil Hague). About a year ago I came across a Native American concept of Wetiko which describes precisely the same phenomenon. Wetiko is the spelling used by the Cree and there are other versions including wintiko and windigo used by other tribal groups. They spell the name with lower case, but I see Wetiko as a proper noun as with Archons and prefer a capital. I first saw an article about Wetiko by writer and researcher Paul Levy which so synced with what I had been writing about the computer/operator disconnection and later the Archons. I then read his book, the fascinating *Dispelling Wetiko, Breaking the Spell of Evil*. The parallels between what I had concluded long before and the Native American concept of Wetiko were so clear and obvious that it was almost funny. For Wetiko see the Gnostic Archons for sure and the Jinn, the Predators, and every other name for a force of evil, inversion and chaos. Wetiko is the Native American name for the force that divides the computer from the operator (Fig 21). Indigenous author Jack D. Forbes, a founder of the Native American movement in the 1960s, wrote another book about Wetiko entitled *Columbus And Other Cannibals – The Wetiko Disease of Exploitation, Imperialism, and Terrorism* which I also read. Forbes says that Wetiko refers to an evil person or spirit ‘who terrorizes other creatures by means of terrible acts, including cannibalism’. Zulu shaman Credo Mutwa told me that African accounts tell how cannibalism was brought into the world by the Chitauri ‘gods’ – another manifestation of Wetiko. The distinction between ‘evil person or spirit’ relates to Archons/Wetiko possessing a human or

acting as pure consciousness. Wetiko is said to be a sickness of the soul or spirit and a state of being that takes but gives nothing back – the Cult and its operatives perfectly described. Black Hawk, a Native American war leader defending their lands from confiscation, said European invaders had ‘poisoned hearts’ – Wetiko hearts – and that this would spread to native societies. Mention of the heart is very significant as we shall shortly see. Forbes writes: ‘Tragically, the history of the world for the past 2,000 years is, in great part, the story of the epidemiology of the wetiko disease.’ Yes, and much longer. Forbes is correct when he says: ‘The wetikos destroyed Egypt and Babylon and Athens and Rome and Tenochtitlan [capital of the Aztec empire] and perhaps now they will destroy the entire earth.’ Evil, he said, is the number one export of a Wetiko culture – see its globalisation with ‘Covid’. Constant war, mass murder, suffering of all kinds, child abuse, Satanism, torture and human sacrifice are all expressions of Wetiko and the Wetiko possessed. The world is Wetiko made manifest, but it doesn’t have to be. There is a way out of this even now. Figure 21: The mind ‘virus’ is known to Native Americans as ‘Wetiko’. (Image by Neil Hague). Cult of Wetiko Wetiko is the Yaldabaoth frequency distortion that seeks to aĵach to human consciousness and absorb it into its own. Once this connection is made Wetiko can drive the perceptions of the target which they believe to be coming from their own mind. All the horrors of history and today from mass killers to Satanists, paedophiles like Jeffrey Epstein and other psychopaths, are the embodiment of Wetiko and express its state of being in all its grotesqueness. The Cult is Wetiko incarnate, Yaldabaoth incarnate, and it seeks to facilitate Wetiko assimilation of humanity in totality into its distortion by manipulating the population into low frequency states that match its own. Paul Levy writes: ‘Holographically enforced within the psyche of every human being the wetiko virus pervades and underlies the entire field of consciousness, and can therefore potentially manifest through any one of us at any moment if we are not mindful.’ The ‘Covid’ hoax has achieved this with many people, but others have not fallen into Wetiko’s frequency lair. Players in the ‘Covid’ human catastrophe including Gates, Schwab, Tedros, Fauci, Whiĵy, Vallance, Johnson, Hancock, Ferguson, Drosten, and all the rest, including

the psychopath psychologists, are expressions of Wetiko. This is why they have no compassion or empathy and no emotional consequence the people who support the psychopaths in authority against the Pushbackers despite the damaging impact the psychopaths have on their own lives and their family's lives. You are again looking at Wetiko possession which prevents them seeing through the lies to the obvious scam going on. Why can't they see it? Wetiko won't let them see it. The perceptual divide that has now become a chasm is between the Wetikoed and the non-Wetikoed. Paul Levy describes Wetiko in the same way that I have long described the Archontic force. They are the same distorted consciousness operating across dimensions of reality: '... the subtle body of wetiko is not located in the third dimension of space and time, literally existing in another dimension ... it is able to affect ordinary lives by mysteriously interpenetrating into our three- dimensional world.' Wetiko does this through its incarnate representatives in the Cult and by weaving itself into The Field which on our level of reality is the electromagnetic information field of the simulation or Matrix. More than that, the simulation is Wetiko / Yaldabaoth. Caleb Scharf, Director of Astrobiology at Columbia University, has speculated that 'alien life' could be so advanced that it has transcribed itself into the quantum realm to become what we call physics. He said intelligence indistinguishable from the fabric of the Universe would solve many of its greatest mysteries: Perhaps hyper-advanced life isn't just external. Perhaps it's already all around. It is embedded in what we perceive to be physics itself, from the root behaviour of particles and fields to the phenomena of complexity and emergence ... In other words, life might not just be in the equations. It might BE the equations [My emphasis]. Scharf said it is possible that 'we don't recognise advanced life because it forms an integral and unsuspecting part of what we've considered to be the natural world'. I agree. Wetiko/Yaldabaoth is the simulation. We are literally in the body of the beast. But that doesn't mean it has to control us. We all have the power to overcome Wetiko influence and the Cult knows that. I doubt it sleeps too well because it knows that. This, I suggest, is how it all works. There are two Fields. One is the fierce electromagnetic light of the Matrix within the speed of light; the other is the 'watery

light' of The Field beyond the walls of the Matrix that connects with the Great Infinity. Five-sense mind and the decoding systems of the body â€ˆach us to the Field of Matrix light. They have to or we could not experience this reality. Five-sense mind sees only the Matrix Field of information while our expanded consciousness is part of the Infinity Field. When we open our minds, and most importantly our hearts, to the Infinity Field we have a mission control which gives us an expanded perspective, a road map, to understand the nature of the five-sense world. If we are isolated only in five-sense mind there is no mission control. We're on our own trying to understand a world that's constantly feeding us information to ensure we do not understand. People in this state can feel 'lost' and bewildered with no direction or radar. You can see ever more clearly those who are influenced by the Fields of Big Infinity or li€le five-sense mind simply by their views and behaviour with regard to the 'Covid' hoax. We have had this division throughout known human history with the mass of the people on one side and individuals who could see and intuit beyond the walls of the simulation – Plato's prisoner who broke out of the cave and saw reality for what it is. Such people have always been targeted by Wetiko/Archon-possessed authority, burned at the stake or demonised as mad, bad and dangerous. The Cult today and its global network of 'anti-hate', 'anti-fascist' Woke groups are all expressions of Wetiko â€ˆacking those exposing the conspiracy, 'Covid' lies and the 'vaccine' agenda. Woke as a whole is Wetiko which explains its black and white mentality and how at one it is with the Wetiko-possessed Cult. Paul Levy said: 'To be in this paradigm is to still be under the thrall of a two-valued logic – where things are either true or false – of a wetikoized mind.' Wetiko consciousness is in a permanent rage, therefore so is Woke, and then there is Woke inversion and contradiction. 'Anti-fascists' act like fascists because fascists and 'anti- fascists' are both Wetiko at work. Political parties act the same while claiming to be different for the same reason. Secret society and satanic rituals are â€ˆaching initiates to Wetiko and the cold, ruthless, psychopathic mentality that secures the positions of power all over the world is Wetiko. Reframing 'training programmes' have the same cumulative effect of â€ˆaching Wetiko and we have their graduates described as automatons

and robots with a cold, psychopathic, uncaring demeanour. They are all traits of Wetiko possession and look how many times they have been described in this book and elsewhere with regard to personnel behind 'Covid' including the police and medical profession. Climbing the greasy pole in any profession in a Wetiko society requires traits of Wetiko to get there and that is particularly true of politics which is not about fair competition and pre-eminence of ideas. It is founded on how many backs you can stab and arses you can lick. This culminated in the global 'Covid' coordination between the Wetiko possessed who pulled it off in all the different countries without a trace of empathy and compassion for their impact on humans. Our sight sense can see only holographic form and not the Field which connects holographic form. Therefore we perceive 'physical' objects with 'space' in between. In fact that 'space' is energy/consciousness operating on multiple frequencies. One of them is Wetiko and that connects the Cult psychopaths, those who submit to the psychopaths, and those who serve the psychopaths in the media operations of the world. Wetiko is Gates. Wetiko is the mask-wearing submissive. Wetiko is the fake journalist and 'fact-checker'. The Wetiko Field is coordinating the whole thing. Psychopaths, gofers, media operatives, 'anti-hate' hate groups, 'fact-checkers' and submissive people work as one unit even without human coordination because they are attached to the same Field which is organising it all (Fig 22). Paul Levy is here describing how Wetiko-possessed people are drawn together and refuse to let any information breach their rigid perceptions. He was writing long before 'Covid', but I think you will recognise followers of the 'Covid' religion oh just a little bit: People who are channelling the vibratory frequency of wetiko align with each other through psychic resonance to reinforce their unspoken shared agreement so as to uphold their deranged view of reality. Once an unconscious content takes possession of certain individuals, it irresistibly draws them together by mutual attraction and knits them into groups tied together by their shared madness that can easily swell into an avalanche of insanity. A psychic epidemic is a closed system, which is to say that it is insular and not open to any new information or informing influences from the outside world which contradict its fixed, limited, and limiting perspective.



There we have the Woke mind and the 'Covid' mind. Compatible resonance draws the awakening together, too, which is clearly Figure 22: The Wetiko Field from which the Cult pyramid and its personnel are made manifest. (Image by Neil Hague). Wetiko doesn't care about humans. It's not human; it just possesses humans for its own ends and the effect (depending on the scale of possession) can be anything from extreme psychopathy to unquestioning obedience. Wetiko's worst nightmare is for human consciousness to expand beyond the simulation. Everything is focussed on stopping that happening through control of information, thus perception, thus frequency. The 'education system', media, science, medicine, academia, are all geared to maintaining humanity in five-sense servitude as is the constant stimulation of low-vibrational mental and emotional states (see 'Covid'). Wetiko seeks to dominate those subconscious spaces between five-sense perception and expanded consciousness where the computer meets the operator. From these subconscious hiding places Wetiko speaks to us to trigger urges and desires that we take to be our own and manipulate us into anything from low-vibrational to psychopathic states. Remember how Islam describes the Jinn as invisible tricksters that 'whisper' and confuse. Wetiko is the origin of the 'trickster god' theme that you find in cultures all over the world. Jinn, like the Archons, are Wetiko which is terrified of humans awakening and reconnecting with our true self for then its energy source has gone. With that the feedback loop breaks between Wetiko and human perception that provides the energetic momentum on which its very existence depends as a force of evil. Humans are both its target and its source of survival, but only if we are operating in low-vibrational states of fear, hate, depression and the background anxiety that most people suffer. We are Wetiko's target because we are its key to survival. It needs us, not the other way round. Paul A vampire has no intrinsic, independent, substantial existence in its own right; it only exists in relation to us. The pathogenic, vampiric mind-parasite called wetiko is nothing in itself – not being able to exist from its own side – yet it has a 'virtual reality' such that it can potentially destroy our species ... ..The fact that a vampire is not reflected by a mirror can also mean that what we need to see is that there's nothing, no-thing to see, other

than ourselves. The fact that wetiko is the expression of something inside of us means that the cure for wetiko is with us as well. The critical issue is finding this cure within us and then putting it into effect. Evil begets evil because if evil does not constantly expand and find new sources of energetic sustenance its evil, its distortion, dies with the assimilation into balance and harmony. Love is the garlic to Wetiko's vampire. Evil, the absence of love, cannot exist in the presence of love. I think I see a way out of here. I have emphasised so many times over the decades that the Archons/Wetiko and their Cult are not all powerful. They are not. I don't care how it looks even now they are not. I have not called them little boys in short trousers for effect. I have said it because it is true. Wetiko's insatiable desire for power over others is not a sign of its omnipotence, but its insecurity. Paul Levy writes: 'Due to the primal fear which ultimately drives it and which it is driven to cultivate, wetiko's body politic has an intrinsic and insistent need for centralising power and control so as to create imagined safety for itself.' Yeeeeeees! Exactly! Why does Wetiko want humans in an ongoing state of fear? Wetiko itself is fear and it is petrified of love. As evil is an absence of love, so love is an absence of fear. Love conquers all and especially Wetiko which is fear. Wetiko brought fear into the world when it wasn't here before. Fear was the 'fall', the fall into low-frequency ignorance and illusion – fear is False Emotion Appearing Real. The simulation is driven and energised by fear because Wetiko/Yaldabaoth (fear) are the simulation. Fear is the absence of love and Wetiko is the absence We can now view current events from this level of perspective. The 'Covid' hoax has generated momentous amounts of ongoing fear, anxiety, depression and despair which have empowered Wetiko. No wonder people like Gates have been the instigators when they are Wetiko incarnate and exhibit every trait of Wetiko in the extreme. See how cold and unemotional these people are like Gates and his cronies, how dead of eye they are. That's Wetiko. Sabbatians are Wetiko and everything they control including the World Health Organization, Big Pharma and the 'vaccine' makers, national 'health' hierarchies, corporate media, Silicon Valley, the banking system, and the United Nations with its planned transformation into world government. All are controlled and possessed by the Wetiko

distortion into distorting human society in its image. We are with this knowledge at the gateway to understanding the world. Divisions of race, culture, creed and sexuality are diversions to hide the real division between those possessed and influenced by Wetiko and those that are not. The 'Covid' hoax has brought both clearly into view. Human behaviour is not about race. Tyrants and dictatorships come in all colours and creeds. What unites the US president bombing the innocent and an African tribe committing genocide against another as in Rwanda? What unites them? Wetiko. All wars are Wetiko, all genocide is Wetiko, all hunger over centuries in a world of plenty is Wetiko. Children going to bed hungry, including in the West, is Wetiko. Cult-generated Woke racial divisions that focus on the body are designed to obscure the reality that divisions in behaviour are manifestations of mind, not body. Obsession with body identity and group judgement is a means to divert attention from the real source of behaviour – mind and perception. Conflict sown by the Woke both within themselves and with their target groups are Wetiko providing lunch for itself through still more agents of the division, chaos, and fear on which it feeds. The Cult is seeking to assimilate the entirety of humanity and all children and young people into the Wetiko frequency by manipulating them into states of fear and despair. Witness all the suicide and psychological unravelling since the spring of 2020. Wetiko psychopaths want to impose a state of unquestioning obedience to authority which is no more than a conduit for Wetiko to enforce its will and assimilate humanity into itself. It needs us to believe that resistance is futile when it fears resistance and even more so the game-changing non-cooperation with its impositions. It can use violent resistance for its benefit. Violent impositions and violent resistance are both Wetiko. The Power of Love with its Power of No will sweep Wetiko from our world. Wetiko and its Cult know that. They just don't want us to know. This brings me to AI or artificial intelligence and something else Wetikos don't want us to know. What is AI really? I know about computer code algorithms and AI that learns from data input. These, however, are more diversions, the expeditionary force, for the real AI that they want to connect to the human brain as promoted by Silicon Valley Wetikos like Kurzweil. What is this AI? It is the frequency of Wetiko, the

frequency of the Archons. The connection of AI to the human brain is the connection of the Wetiko frequency to create a Wetiko hive mind and complete the job of assimilation. The hive mind is planned to be controlled from Israel and China which are both 100 percent owned by Wetiko Sabbatians. The assimilation process has been going on minute by minute in the 'smart' era which fused with the 'Covid' era. We are told that social media is scrambling the minds of the young and changing their personality. This is true, but what is social media? Look more deeply at how it works, how it creates divisions and conflict, the hostility and cruelty, the targeting of people until they are destroyed. That's Wetiko. Social media is manipulated to tune people to the Wetiko frequency with all the emotional exploitation tricks employed by platforms like Facebook and its Wetiko front man, Zuckerberg. Facebook's Instagram announced a new platform for children to overcome a legal bar on them using the main site. This is more Wetiko exploitation and manipulation of kids. Amnesty International likened the plan to foxes offering to guard the henhouse and said it was incompatible with human rights. Since when did Wetiko or Zuckerberg (I repeat myself) care about that? Would Brin and Page at Google, Wojcicki at YouTube, Bezos at Amazon and whoever the hell runs Twiŕer act as they do if they were not channelling Wetiko? Would those who are developing technologies for no other reason than human control? How about those designing and selling technologies to kill people and Big Pharma drug and 'vaccine' producers who know they will end or devastate lives? Quite a thought for these people to consider is that if you are Wetiko in a human life you are Wetiko on the 'other side' unless your frequency changes and that can only change by a change of perception which becomes a change of behaviour. Where Gates is going does not bear thinking about although perhaps that's exactly where he wants to go. Either way, that's where he's going. His frequency will make it so. The frequency lair I have been saying for a long time that a big part of the addiction to smartphones and devices is that a frequency is coming off them that entraps the mind. People spend ages on their phones and sometimes even a minute or so aŕter they put them down they pick them up again and it all repeats. 'Covid' lockdowns will have increased this addiction a million times for obvious reasons.

Addictions to alcohol overindulgence and drugs are another way that Wetiko entraps consciousness to attach to its own. Both are symptoms of low- vibrational psychological distress which alcoholism and drug addiction further compound. Do we think it's really a coincidence that access to them is made so easy while potions that can take people into realms beyond the simulation are banned and illegal? I have explored smartphone addiction in other books, the scale is mind-blowing, and that level of addiction does not come without help. Tech companies that make these phones are Wetiko and they will have no qualms about destroying the minds of children. We are seeing again with these companies the Wetiko perceptual combination of psychopathic enforcers and weak and meek unquestioning compliance by the rank and file. The global Smart Grid is the Wetiko Grid and it is crucial to complete the Cult endgame. The simulation is radiation and we are being deluged with technological radiation on a devastating scale. Wetiko frauds like Elon Musk serve Cult interests while occasionally criticising them to maintain his street-cred. 5G and other forms of Wi-Fi are being directed at the earth from space on a volume and scale that goes on increasing by the day. Elon Musk's (officially) SpaceX Starlink project is in the process of putting tens of thousands of satellites in low orbit to cover every inch of the planet with 5G and other Wi-Fi to create Kurzweil's global 'cloud' to which the human mind is planned to be attached very soon. SpaceX has approval to operate 12,000 satellites with more than 1,300 launched at the time of writing and applications filed for 30,000 more. Other operators in the Wi-Fi, 5G, low-orbit satellite market include OneWeb (UK), Telesat (Canada), and AST & Science (US). Musk tells us that AI could be the end of humanity and then launches a company called Neuralink to connect the human brain to computers. Musk's (in theory) Tesla company is building electric cars and the driverless vehicles of the smart control grid. As frauds and bullshitters go Elon Musk in my opinion is Major League. 5G and technological radiation in general are destructive to human health, genetics and psychology and increasing the strength of artificial radiation underpins the five-sense perceptual bubbles which are themselves expressions of radiation or electromagnetism. Freedom activist John Whitehead was so right

with his 'databit by databit, we are building our own electronic concentration camps'. The Smart Grid and 5G is a means to control the human mind and infuse perceptual information into The Field to influence anyone in sync with its frequency. You can change perception and behaviour en masse if you can manipulate the population into those levels of frequency and this is happening all around us today. The arrogance of Musk and his fellow Cult operatives knows no bounds in the way that we see with Gates. Musk's satellites are so many in number already they are changing the night sky when viewed from Earth. The astronomy community has complained about this and they have seen nothing yet. Some consequences of Musk's Wetiko hubris include: Radiation; visible pollution of the night sky; interference with astronomy and meteorology; ground and water pollution from intensive use of increasingly many spaceports; accumulating space debris; continual deorbiting and burning up of aging satellites, polluting the atmosphere with toxic dust and smoke; and ever-increasing likelihood of collisions. A collective public open letter of complaint to Musk said: We are writing to you ... because SpaceX is in process of surrounding the Earth with a network of thousands of satellites whose very purpose is to irradiate every square inch of the Earth. SpaceX, like everyone else, is treating the radiation as if it were not there. As if the mitochondria in our cells do not depend on electrons moving undisturbed from the food we digest to the oxygen we breathe. As if our nervous systems and our hearts are not subject to radio frequency interference like any piece of electronic equipment. As if the cancer, diabetes, and heart disease that now afflict a majority of the Earth's population are not metabolic diseases that result from interference with our cellular machinery. As if insects everywhere, and the birds and animals that eat them, are not starving to death as a result. People like Musk and Gates believe in their limitless Wetiko arrogance that they can do whatever they like to the world because they own it. Consequences for humanity are irrelevant. It's absolutely time that we stopped taking this shit from these self-styled masters of the Earth when you consider where this is going. Why is the Cult so anti-human? I hear this question often: Why would they do this when it will affect them, too? Ah, but will it? Who is this them? Forget their bodies. They are

just vehicles for Wetiko consciousness. When you break it all down to the foundations we are looking at a state of severely distorted consciousness targeting another state of consciousness for assimilation. The rest is detail. The simulation is the fly-trap in which unique sensations of the five senses create a cycle of addiction called reincarnation. Renegade Minds see that everything which happens in our reality is a smaller version of the whole picture in line with the holographic principle. Addiction to the radiation of smart technology is a smaller version of addiction to the whole simulation. Connecting the body/brain to AI is taking that addiction on a giant step further to total ongoing control by assimilating human incarnate consciousness into Wetiko. I have watched during the 'Covid' hoax how many are becoming ever more profoundly aâached to Wetiko's perceptual calling cards of aggressive response to any other point of view ('There is no other god but me'), psychopathic lack of compassion and empathy, and servile submission to the narrative and will of authority. Wetiko is the psychopaths and subservience to psychopaths. The Cult of Wetiko is so anti-human because it is not human. It embarked on a mission to destroy human by targeting everything that it means to be human and to survive as human. 'Covid' is not the end, just a means to an end. The Cult with its Wetiko consciousness is seeking to change Earth systems, including the atmosphere, to suit them, not humans. The gathering bombardment of 5G alone from ground and space is dramatically changing The Field with which the five senses interact. There is so much more to come if we sit on our hands and hope it will all go away. It is not meant to go away. It is meant to get ever more extreme and we need to face that while we still can – just. Carbon dioxide is the gas of life. Without that human is over. Kaput, gone, history. No natural world, no human. The Cult has created a cock and bull story about carbon dioxide and climate change to justify its reduction to the point where Gates and the ignoramus Biden 'climate chief' John Kerry want to suck it out of the atmosphere. Kerry wants to do this because his master Gates does. Wetikos have made the gas of life a demon with the usual support from the Wokers of Extinction Rebellion and similar organisations and the bewildered puppet-child that is Greta Thunberg who was put on the world stage by Klaus Schwab and the World

Economic Forum. The name Extinction Rebellion is both ironic and as always Wetiko inversion. The gas that we need to survive must be reduced to save us from extinction. The most basic need of human is oxygen and we now have billions walking around in face nappies depriving body and brain of this essential requirement of human existence. More than that 5G at 60 gigahertz interacts with the oxygen molecule to reduce the amount of oxygen the body can absorb into the bloodstream. The obvious knock-on consequences of that for respiratory and cognitive problems and life itself need no further explanation. Psychopaths like Musk are assembling a global system of satellites to deluge the human atmosphere with this insanity. The man should be in jail. Here we have two most basic of human needs, oxygen and carbon dioxide, being dismantled. Two others, water and food, are getting similar treatment with the United Nations Agendas 21 and 2030 – the Great Reset – planning to centrally control all water and food supplies. People will not even own rain water that falls on their land. Food is affected at the most basic level by reducing carbon dioxide. We have genetic modification or GMO infiltrating the food chain on a mass scale, pesticides and herbicides polluting the air and destroying the soil. Freshwater fish that provide livelihoods for 60 million people and feed hundreds of millions worldwide are being ‘pushed to the brink’ according the conservationists while climate change is the only focus. Now we have Gates and Schwab wanting to dispense with current food sources all together and replace them with a synthetic version which the Wetiko Cult would control in terms of production and who eats and who doesn’t. We have been on the Totalitarian Tiptoe to this for more than 60 years as food has become ever more processed and full of chemical shite to the point today when it’s not natural food at all. As Dr Tom Cowan says: ‘If it has a label don’t eat it.’ Bill Gates is now the biggest owner of farmland in the United States and he does nothing without an ulterior motive involving the Cult. Klaus Schwab wrote: ‘To feed the world in the next 50 years we will need to produce as much food as was produced in the last 10,000 years ... food security will only be achieved, however, if regulations on genetically modified foods are adapted to reflect the reality that gene editing offers a precise, efficient and safe method of improving crops.’ Liar. People and the world are



being targeted with aluminium through vaccines, chemtrails, food, drink cans, and endless other sources when aluminium has been linked to many health issues including dementia which is increasing year after year. Insects, bees and wildlife essential to the food chain are being deleted by pesticides, herbicides and radiation which 5G is dramatically increasing with 6G and 7G to come. The pollinating bee population is being devastated while wildlife including birds, dolphins and whales are having their natural radar blocked by the effects of ever-increasing radiation. In the summer windscreens used to be splattered with insects so numerous were they. It doesn't happen now. Where have they gone? The Cult is introducing genetically-modified versions of trees, plants and insects including a Gates-funded project to unleash hundreds of millions of genetically-modified, lab-altered and patented male mosquitoes to mate with wild mosquitoes and induce genetic flaws that cause them to die out. Clinically-insane Gates-funded Japanese researchers have developed mosquitos that spread vaccine and are dubbed 'flying vaccinators'. Gates is funding the modification of weather patterns in part to sell the myth that this is caused by carbon dioxide and he's funding geoengineering of the skies to change the atmosphere. Some of this came to light with the Gates-backed plan to release tonnes of chalk into the atmosphere to 'deflect the Sun and cool the planet'. Funny how they do this while the heating effect of the Sun is not factored into climate projections focussed on carbon dioxide. The reason is that they want to reduce carbon dioxide (so don't mention the Sun), but at the same time they do want to reduce the impact of the Sun which is so essential to human life and health. I have mentioned the sun-cholesterol-vitamin D connection as they demonise the Sun with warnings about skin cancer (caused by the chemicals in sun cream they tell you to splash on). They come from the other end of the process with statin drugs to reduce cholesterol that turns sunlight into vitamin D. A lack of vitamin D leads to a long list of health effects and how vitamin D levels must have fallen with people confined to their homes over 'Covid'. Gates is funding other forms of geoengineering and most importantly chemtrails which are dropping heavy metals, aluminium and self-replicating nanotechnology onto the Earth which is killing the natural

world. See Everything You Need To Know, But Have Never Been Told for the detailed background to this. Every human system is being targeted for deletion by a force that's not human. The Wetiko Cult has embarked on the process of transforming the human body from biological to synthetic biological as I have explained. Biological is being replaced by the artificial and synthetic – Archontic 'countermimicry' – right across human society. The plan eventually is to dispense with the human body altogether and absorb human consciousness – which it wouldn't really be by then – into cyberspace (the simulation which is Wetiko/Yaldabaoth). Preparations for that are already happening if people would care to look. The alternative media rightly warns about globalism and 'the globalists', but this is far bigger than that and represents the end of the human race as we know it. The 'bad copy' of prime reality that Gnostics describe was a bad copy of harmony, wonder and beauty to start with before Wetiko/Yaldabaoth set out to change the simulated 'copy' into something very different. The process was slow to start with. Entrapped humans in the simulation timeline were not technologically aware and they had to be brought up to intellectual speed while being suppressed spiritually to the point where they so. We have now reached that stage where technological intellect has the potential to destroy us and that's why events are moving so fast. Central American shaman Don Juan Matus said: Think for a moment, and tell me how you would explain the contradictions between the intelligence of man the engineer and the stupidity of his systems of belief, or the stupidity of his contradictory behaviour. Sorcerers believe that the predators have given us our systems of beliefs, our ideas of good and evil; our social mores. They are the ones who set up our dreams of success or failure. They have given us covetousness, greed, and cowardice. It is the predator who makes us complacent, routinary, and egomaniacal. In order to keep us obedient and meek and weak, the predators engaged themselves in a stupendous manoeuvre – stupendous, of course, from the point of view of a fighting strategist; a horrendous manoeuvre from the point of those who suffer it. They gave us their mind. The predators' mind is baroque, contradictory, morose, filled with the fear of being discovered any For 'predators' see Wetiko, Archons, Yaldabaoth, Jinn, and all the

other versions of the same phenomenon in cultures and religions all over the world. The theme is always the same because it's true and it's real. We have reached the point where we have to deal with it. The question is – how? Don't fight – walk away I thought I'd use a controversial subheading to get things moving in terms of our response to global fascism. What do you mean 'don't fight'? What do you mean 'walk away'? We've got to fight. We can't walk away. Well, it depends what we mean by fight and walk away. If fighting means physical combat we are playing Wetiko's game and falling for its trap. It wants us to get angry, aggressive, and direct hate and hostility at the enemy we think we must fight. Every war, every battle, every conflict, has been fought with Wetiko leading both sides. It's what it does. Wetiko wants a fight, anywhere, any place. Just hit me, son, so I can hit you back. Wetiko hits Wetiko and Wetiko hits Wetiko in return. I am very forthright as you can see in exposing Wetikos of the Cult, but I don't hate them. I refuse to hate them. It's what they want. What you hate you become. What you fight you become. Wokers, 'anti-haters' and 'anti-fascists' prove this every time they reach for their keyboards or don their balaclavas. By walk away I mean to disengage from Wetiko which includes ceasing to cooperate with its tyranny. Paul Levy says of Wetiko: The way to 'defeat' evil is not to try to destroy it (for then, in playing evil's game, we have already lost), but rather, to find the invulnerable place within ourselves where evil is unable to vanquish us – this is to truly 'win' our battle with evil. Wetiko is everywhere in human society and it's been on steroids since the 'Covid' hoax. Every shouting match over wearing masks has Wetiko wearing a mask and Wetiko not wearing one. It's an electrical circuit of push and resist, push and resist, with Wetiko pushing and resisting. Each polarity is Wetiko empowering itself. Dictionary definitions of 'resist' include 'opposing, refusing to accept or comply with' and the word to focus on is 'opposing'. What form does this take – sejing police cars alight or 'refusing to accept or comply with'? The former is Wetiko opposing Wetiko while the other points the way forward. This is the difference between those aggressively demanding that government fascism must be obeyed who stand in stark contrast to the great majority of Pushbackers. We saw this clearly with a march by thousands of Pushbackers against lockdown in London

followed days later by a Worker-hijacked protest in Bristol in which police cars were set on fire. Masks were virtually absent in London and widespread in Bristol. Wetiko wants lockdown on every level of society and infuses its aggression to police it through its unknowing stooges. Lockdown protesters are the ones with the smiling faces and the hugs, The two blatantly obvious states of being – geïng more obvious by the day – are the result of Wokers and their like becoming ever more influenced by the simulation Field of Wetiko and Pushbackers ever more influenced by The Field of a far higher vibration beyond the simulation. Wetiko can't invade the heart which is where most lockdown opponents are coming from. It's the heart that allows them to see through the lies to the truth in ways I will be highlighting. Renegade Minds know that calmness is the place from which wisdom comes. You won't find wisdom in a hissing fit and wisdom is what we need in abundance right now. Calmness is not weakness – you don't have to scream at the top of your voice to be strong. Wetiko possessed and influenced don't know how to deal with that. Wetiko wants a fight and we should not give it one. What it needs more than anything is our cooperation and we should not give that either. Mass rallies and marches are great in that they are a visual representation of feeling, but if it ends there they are irrelevant. You demand that Wetikos act differently? Well, they're not going to are they? They are Wetikos. We don't need to waste our time demanding that something doesn't happen when that will make no difference. We need to delete the means that allows it to happen. This, invariably, is our cooperation. You can demand a child stop firing a peashooter at the dog or you can refuse to buy the peashooter. If you provide the means you are cooperating with the dog being smacked on the nose with a pea. How can the authorities enforce mask-wearing if millions in a country refuse? What if the 74 million Pushbackers that voted for Trump in 2020 refused to wear masks, close their businesses or stay in their homes. It would be unenforceable. The few control the many through the compliance of the many and that's always been the dynamic be it 'Covid' regulations or the Roman Empire. I know people can find it intimidating to say no to authority or stand out in a crowd for being the only one with a face on display; but it has to be done or it's over. I hope

I've made clear in this book that where this is going will be far more intimidating than standing up now and saying 'No' – I will not cooperate with my own enslavement and that of my children. There might be consequences for some initially, although not so if enough do the same. The question that must be addressed is what is going to happen if we don't? It is time to be strong and unyieldingly so. No means no. Not here and there, but everywhere and always. I have refused to wear a mask and obey all the other nonsense. I will not comply with tyranny. I repeat: Fascism is not imposed by fascists – there are never enough of them. Fascism is imposed by the population acquiescing to fascism. I will not do it. I will die first, or my body will. Living meekly under fascism is a form of death anyway, the death of the spirit that Martin Luther King described. Making things happen We must not despair. This is not over till it's over and it's far from that. The 'fat lady' must refuse to sing. The longer the 'Covid' hoax has dragged on and impacted on more lives we have seen an awakening of phenomenal numbers of people worldwide to the realisation that what they have believed all their lives is not how the world really is. Research published by the system-serving University of Bristol and King's College London in February, 2021, concluded: 'One in every 11 people in Britain say they trust David Icke's take on the coronavirus pandemic.' It will be more by now and we have gathering numbers to build on. We must urgently progress from seeing the scam to ceasing to cooperate with it. Prominent German lawyer Reiner Fuellmich, also licenced to practice law in America, is psychopaths to justice through a second Nuremberg tribunal for crimes against humanity. Fuellmich has an impressive record of beating the elite in court and he formed the German Corona Investigative Commiŕŕee to pursue civil charges against the main perpetrators with a view to triggering criminal charges. Most importantly he has grasped the foundation of the hoax – the PCR test not testing for the 'virus' – and Christian Drosten is therefore on his charge sheet along with Gates frontman Tedros at the World Health Organization. Major players must be not be allowed to inflict their horrors on the human race without being brought to book. A life sentence must follow for Bill Gates and the rest of them. A group of researchers has also indicted the government of Norway for crimes against humanity with

copies sent to the police and the International Criminal Court. The lawsuit cites participation in an internationally-planned false pandemic and violation of international law and human rights, the European Commission's definition of human rights by coercive rules, Nuremberg and Hague rules on fundamental human rights, and the Norwegian constitution. We must take the initiative from hereon and not just complain, protest and react. There are practical ways to support vital mass non-cooperation. Organising in numbers is one. Lockdown marches in London in the spring in 2021 were mass non-cooperation that the authorities could not stop. There were too many people. Hundreds of thousands walked the London streets in the centre of the road for mile after mile while the Face-Nappies could only look on. They were determined, but calm, and just did it with no histrionics and lots of smiles. The police were impotent. Others are organising group shopping without masks for mutual support and imagine if that was happening all over. Policing it would be impossible. If the store refuses to serve people in these circumstances they would be faced with a long line of trolleys full of goods standing on their own and everything would have to be returned to the shelves. How would they cope with that if it kept happening? I am talking here about moving on from complaining to being pro-active; from watching things happen to making things happen. I include in this our relationship with the police. The behaviour of many Face-Nappies has been disgraceful and anyone who thinks they would never find concentration camp guards in the 'enlightened' modern era have had that myth busted big-time. The period and setting may change – Wetikos never do. I watched film footage from a London march in which a police thug viciously kicked a protestor on the floor who had done nothing. His fellow Face-Nappies stood in a ring protecting him. What he did was a criminal assault and with a crowd far outnumbering the police this can no longer be allowed to happen unchallenged. I get it when people chant 'shame on you' in these circumstances, but that is no longer enough. They have no shame those who do this. Crowds need to start making a citizen's arrest of the police who commit criminal offences and brutally attack innocent people and defenceless women. A citizen's arrest can be made under section 24A of the UK Police and Criminal

Evidence (PACE) Act of 1984 and you will find something similar in other countries. I prefer to call it a Common Law arrest rather than citizen's for reasons I will come to shortly. Anyone can arrest a person committing an indictable offence or if they have reasonable grounds to suspect they are committing an indictable offence. On both counts the attack by the police thug would have fallen into this category. A citizen's arrest can be made to stop someone: Causing physical injury to himself or any other person Suffering physical injury Causing loss of or damage to property Making off before a constable can assume responsibility for him A citizen's arrest may also be made to prevent a breach of the peace under Common Law and if they believe a breach of the peace will happen or anything related to harm likely to be done or already done in their presence. This is the way to go I think – the Common Law version. If police know that the crowd and members of the public will no longer be standing and watching while they commit their thuggery and crimes they will think twice about acting like Brownshirts and Blackshirts. Common Law – common sense Mention of Common Law is very important. Most people think the law is the law as in one law. This is not the case. There are two bodies of law, Common Law and Statute Law, and they are not the same. Common Law is founded on the simple premise of do no harm. It does not recognise victimless crimes in which no harm is done while Statute Law does. There is a Statute Law against almost everything. So what is Statute Law? Amazingly it's the law of the sea that was brought ashore by the Cult to override the law of the land which is Common Law. They had no right to do this and as always they did it anyway. They had to. They could not impose their will on the people through Common Law which only applies to do no harm. How could you stitch up the fine detail of people's lives with that? Instead they took the law of the sea, or Admiralty Law, and applied it to the population. Statute Law refers to all the laws spewing out of governments and their agencies including all the fascist laws and regulations relating to 'Covid'. The key point to make is that Statute Law is contract law. It only applies between contracting corporations. Most police officers don't even know this. They have to be kept in the dark, too. Long ago when merchants and their sailing ships began to trade with different countries a contractual

law was developed called Admiralty Law and other names. Again it only applied to contracts agreed between corporate entities. If there is no agreed contract the law of the sea had no jurisdiction and that still applies to its new alias of Statute Law. The problem for the Cult when the law of the sea was brought ashore was an obvious one. People were not corporations and neither were government entities. To overcome the lajêr they made governments and all associated organisations corporations. All the institutions are private corporations and I mean governments and their agencies, local councils, police, courts, military, US states, the whole lot. Go to the Dun and Bradstreet corporate listings website for confirmation that they are all corporations. You are arrested by a private corporation called the police by someone who is really a private security guard and they take you to court which is another private corporation. Neither have jurisdiction over you unless you consent and contract with them. This is why you hear the mantra about law enforcement policing by consent of the people. In truth the people 'consent' only in theory through monumental trickery. Okay, the Cult overcame the corporate law problem by making governments and institutions corporate entities; but what about people? They are not corporations are they? Ah ... well in a sense, and only a sense, they are. Not people exactly – the illusion of people. The Cult creates a corporation in the name of everyone at the time that their birth certificate is issued. Note birth/ berth certificate and when you go to court under the law of the sea on land you stand in a dock. These are throwbacks to the origin. My Common Law name is David Vaughan Icke. The name of the corporation created by the government when I was born is called Mr David Vaughan Icke usually wriĵen in capitals as MR DAVID VAUGHAN ICKE. That is not me, the living, breathing man. It is a fictitious corporate entity. The trick is to make you think that David Vaughan Icke and MR DAVID VAUGHAN ICKE are the same thing. They are not. When police charge you and take you to court they are prosecuting the corporate entity and not the living, breathing, man or woman. They have to trick you into identifying as the corporate entity and contracting with them. Otherwise they have no jurisdiction. They do this through a language known as legalese. Lawful and legal are not the same either. Lawful relates to Common Law and legal relates to



Statute Law. Legalese is the language of Statute Law which uses terms that mean one thing to the public and another in legalese. Notice that when a police officer tells someone why they are being charged he or she will say at the end: 'Do you understand?' To the public that means 'Do you comprehend?' In legalese it means 'Do you stand under me?' Do you stand under my authority? If you say yes to the question you are unknowingly agreeing to give them jurisdiction over you in a contract between two corporate entities. This is a confidence trick in every way. Contracts have to be agreed between informed parties and if you don't know that David Vaughan Icke is agreeing to be the corporation MR DAVID VAUGHAN ICKE you cannot knowingly agree to contract. They are deceiving you and another way they do this is to ask for proof of identity. You usually show them a driving licence or other document accepting that you are that corporate entity when you are not. Referring to yourself as a 'person' or 'citizen' is also identifying with your corporate fiction which is why I made the Common Law point about the citizen's arrest. If you are approached by a police officer you identify yourself immediately as a living, breathing, man or woman and say 'I do not consent, I do not contract with you and I do not understand' or stand under their authority. I have a Common Law birth certificate as a living man and these are available at no charge from [commonlawcourt.com](http://commonlawcourt.com). Businesses registered under the Statute Law system means that its laws apply. There are, however, ways to run a business under Common Law. Remember all 'Covid' laws and regulations are Statute Law – the law of contracts and you do not have to contract. This doesn't mean that you can kill someone and get away with it. Common Law says do no harm and that applies to physical harm, financial harm etc. Police are employees of private corporations and there needs to be a new system of non- corporate Common Law constables operating outside the Statute Law system. If you go to [davidicke.com](http://davidicke.com) and put Common Law into the search engine you will find videos that explain Common Law in much greater detail. It is definitely a road we should walk. With all my heart I have heard people say that we are in a spiritual war. I don't like the term 'war' with its Wetiko dynamic, but I know what they mean. Sweep aside all the bodily forms and we are in a situation in which two states of consciousness are seeking very different

realities. Wetiko wants upheaval, chaos, fear, suffering, conflict and control. The other wants love, peace, harmony, fairness and freedom. That's where we are. We should not fall for the idea that Wetiko is all-powerful and there's nothing we can do. Wetiko is not all-powerful. It's a joke, pathetic. It doesn't have to be, but it has made that choice for now. A handful of times over the years when I have felt the presence of its frequency I have allowed it to aŕach briefly so I could consciously observe its nature. The experience is not pleasant, the energy is heavy and dark, but the ease with which you can kick it back out the door shows that its real power is in persuading us that it has power. It's all a con. Wetiko is a con. It's a trickster and not a power that can control us if we unleash our own. The con is founded on manipulating humanity to give its power to Wetiko which recycles it back to present the illusion that it has power when its power is ours that we gave away. This happens on an energetic level and plays out in the world of the seen as humanity giving its power to Wetiko authority which uses that power to control the population when the power is only the power the population has handed over. How could it be any other way for billions to be controlled by a relative few? I have had experiences with people possessed by Wetiko and again you can kick its arse if you do it with an open heart. Oh yes – the heart which can transform the world of perceived We are receiver-transmĭĵers and processors of information, but what information and where from? Information is processed into perception in three main areas – the brain, the heart and the belly. These relate to thinking, knowing, and emotion. Wetiko wants us to be head and belly people which means we think within the confines of the Matrix simulation and low-vibrational emotional reaction scrambles balance and perception. A few minutes on social media and you see how emotion is the dominant force. Woke is all emotion and is therefore thought-free and fact-free. Our heart is something different. It knows while the head thinks and has to try to work it out because it doesn't know. The human energy field has seven prime vortexes which connect us with wider reality (Fig 23). Chakra means 'wheels of light' in the Sanskrit language of ancient India. The main ones are: The crown chakra on top of the head; brow (or 'third eye') chakra in the centre of the forehead; throat chakra; heart chakra in the centre of the chest;

solar plexus chakra below the sternum; sacral chakra beneath the navel; and base chakra at the bottom of the spine. Each one has a particular function or functions. We feel anxiety and nervousness in the belly where the sacral chakra is located and this processes emotion that can affect the colon to give people 'the shits' or make them 'shit scared' when they are nervous. Chakras all play an important role, but the Mr and Mrs Big is the heart chakra which sits at the centre of the seven, above the chakras that connect us to the 'physical' and below those that connect with higher realms (or at least should). Here in the heart chakra we feel love, empathy and compassion – 'My heart goes out to you'. Those with closed hearts become literally 'heart-less' in their attitudes and behaviour (see Bill Gates). Native Americans portrayed Wetiko with what Paul Levy calls a 'frigid, icy heart, devoid of mercy' (see Bill Gates). Figure 23: The chakra system which interpenetrates the human energy field. The heart chakra is the governor – or should be. Wetiko trembles at the thought of heart energy which it cannot infiltrate. The frequency is too high. What it seeks to do instead is close the heart chakra vortex to block its perceptual and energetic influence. Psychopaths have 'hearts of stone' and emotionally- damaged people have 'heartache' and 'broken hearts'. The astonishing amount of heart disease is related to heart chakra disruption with its fundamental connection to the 'physical' heart. Dr Tom Cowan has written an outstanding book challenging the belief that the heart is a pump and making the connection between the 'physical' and spiritual heart. Rudolph Steiner who was way ahead of his time said the same about the fallacy that the heart is a pump. What? The heart is not a pump? That's crazy, right? Everybody knows that. Read Cowan's Human Heart, Cosmic Heart and you will realise that the very idea of the heart as a pump is ridiculous when you see the evidence. How does blood in the feet so far from the heart get pumped horizontally up the body by the heart?? Cowan explains in the book the real reason why blood moves as it does. Our 'physical' heart is used to symbolise love when the source is really the heart vortex or spiritual heart which is our most powerful energetic connection to 'out there' expanded consciousness. That's why we feel knowing – intuitive knowing – in the centre of the chest. Knowing doesn't come from a process of thoughts

leading to a conclusion. It is there in an instant all in one go. Our heart knows because of its connection to levels of awareness that do know. This is the meaning and source of intuition – intuitive. For the last more than 30 years of uncovering the global game and the nature of reality my heart has been my constant antenna for truth and accuracy. An American intelligence insider once said that I had quoted a disinformant in one of my books and yet I had only quoted the part that was true. He asked: 'How do you do that?' By using my heart antenna was the answer and anyone can do it. Heart-centred is how we are meant to be. With a closed heart chakra we withdraw into a closed mind and the bubble of five-sense reality. If you take a moment to focus your attention on the centre of your chest, picture a spinning wheel of light and see it opening and expanding. You will feel it happening, too, and perceptions of the heart like joy and love as the heart impacts on the mind as they interact. The more the chakra opens the more you will feel expressions of heart consciousness and as the process continues, and becomes part of you, insights and knowings will follow. An open heart is connected to that level of awareness that knows all is One. You will see from its perspective that the fault-lines that divide us are only illusions to control us. An open heart does not process the illusions of race, creed and sexuality except as brief experiences for a consciousness that is all. Our heart does not see division, only unity (Figs 24 and 25). There's something else, too. Our hearts love to laugh. Mark Twain's quote that says 'The human race has one really effective weapon, and that is laughter' is really a reference to the heart which loves to laugh with the joy of knowing the true nature of infinite reality and that all the madness of human society is an illusion of the mind. Twain also said: 'Against the assault of laughter nothing can stand.' This is so true of Wetiko and the Cult. Their insecurity demands that they be taken seriously and their power and authority acknowledged and feared. We should do nothing of the sort. We should not get aggressive or fearful which their insecurity so desires. We should laugh in their face. Even in their no-face as police come over in their face-nappies and expect to be taken seriously. They don't take themselves seriously looking like that so why should we? Laugh in the face of intimidation. Laugh in the face of tyranny. You

will see by its reaction that you have pressed all of its bujōns. Wetiko does not know what to do in the face of laughter or when its targets refuse to concede their joy to fear. We have seen many examples during the 'Covid' hoax when people have expressed their energetic power and the string puppets of Wetiko retreat with their tail limp between their knees. Laugh – the world is bloody mad aĝer all and if it's a choice between laughter and tears I know which way I'm going. Figure 24: Head consciousness without the heart sees division and everything apart from Figure 25: Heart consciousness sees everything as One. 'Vaccines' and the soul The foundation of Wetiko/Archon control of humans is the separation of incarnate five-sense mind from the infinite 'I' and closing the heart chakra where the True 'I' lives during a human life. The goal has been to achieve complete separation in both cases. I was interested therefore to read an account by a French energetic healer of what she said she experienced with a patient who had been given the 'Covid' vaccine. Genuine energy healers can sense information and consciousness fields at different levels of being which are referred to as 'subtle bodies'. She described treating the patient who later returned aĝer having, without the healer's knowledge, two doses of the 'Covid vaccine'. The healer said: I noticed immediately the change, very heavy energy emanating from [the] subtle bodies. The scariest thing was when I was working on the heart chakra, I connected with her soul: it was detached from the physical body, it had no contact and it was, as if it was floating in a state of total confusion: a damage to the consciousness that loses contact with the physical body, i.e. with our biological machine, there is no longer any communication between them. I continued the treatment by sending light to the heart chakra, the soul of the person, but it seemed that the soul could no longer receive any light, frequency or energy. It was a very powerful experience for me. Then I understood that this substance is indeed used to detach consciousness so that this consciousness can no longer interact through this body that it possesses in life, where there is no longer any contact, no frequency, no light, no more energetic balance or mind. This would create a human that is rudderless and at the extreme almost zombie-like operating with a fractional state of consciousness at the mercy of Wetiko. I was especially intrigued by what the

healer said in the light of the prediction by the highly-informed Rudolf Steiner more than a hundred years ago. He said: In the future, we will eliminate the soul with medicine. Under the pretext of a 'healthy point of view', there will be a vaccine by which the human body will be treated as soon as possible directly at birth, so that the human being cannot develop the thought of the existence of soul and Spirit. To materialistic doctors will be entrusted the task of removing the soul of humanity. As today, people are vaccinated against this disease or that disease, so in the future, children will be vaccinated with a substance that can be produced precisely in such a way that people, thanks to this vaccination, will be immune to being subjected to the 'madness' of spiritual life. He would be extremely smart, but he would not develop a conscience, and that is the true goal of some materialistic circles. Steiner said the vaccine would detach the physical body from the etheric body (subtle bodies) and 'once the etheric body is detached the relationship between the universe and the etheric body would become extremely unstable, and man would become an automaton'. He said 'the physical body of man must be polished on this Earth by spiritual will – so the vaccine becomes a kind of arymanique (Wetiko) force' and 'man can no longer get rid of a given materialistic feeling'. Humans would then, he said, become 'materialistic of constitution and can no longer rise to the spiritual'. I have been writing for years about DNA being a receiver-transmitter of information that connects us to other levels of reality and these 'vaccines' changing DNA can be likened to changing an antenna and what it can transmit and receive. Such a disconnection would clearly lead to changes in personality and perception. Steiner further predicted the arrival of AI. Big Pharma 'Covid vaccine' makers, expressions of Wetiko, are testing their DNA-manipulating evil on children as I write with a view to giving the 'vaccine' to babies. If it's a soul-body disconnecter – and I say that it is or can be – every child would be disconnected from 'soul' at birth and the 'vaccine' would create a closed system in which spiritual guidance from the greater self would play no part. This has been the ambition of Wetiko all along. A Pentagon video from 2005 was leaked of a presentation explaining the development of vaccines to change behaviour by their effect on the brain. Those that believe this is not

happening with the 'Covid' genetically-modifying procedure masquerading as a 'vaccine' should make an urgent appointment with Naivety Anonymous. Klaus Schwab wrote in 2018: Neurotechnologies enable us to better influence consciousness and thought and to understand many activities of the brain. They include decoding what we are thinking in fine levels of detail through new chemicals and interventions that can influence our brains to correct for errors or enhance functionality. The plan is clear and only the heart can stop it. With every heart that opens, every mind that awakens, Wetiko is weakened. Heart and love are far more powerful than head and hate and so nothing like a majority is needed to turn this around. Beyond the Phantom Our heart is the prime target of Wetiko and so it must be the answer to Wetiko. We are our heart which is part of one heart, the infinite heart. Our heart is where the true self lives in a human life behind firewalls of five-sense illusion when an imposter takes its place – Phantom Self; but our heart waits patiently to be set free any time we choose to see beyond the Phantom, beyond Wetiko. A Wetikoed Phantom Self can wreak mass death and destruction while the love of forever is locked away in its heart. The time is here to unleash its power and let it sweep away the fear and despair that is Wetiko. Heart consciousness does not seek manipulated, censored, advantage for its belief or religion, its activism and desires. As an expression of the One it treats all as One with the same rights to freedom and opinion. Our heart demands fairness for itself no more than for others. From this unity of heart we can come together in mutual support and transform this Wetikoed world into what reality is meant to be – a place of love, joy, happiness, fairness, justice and freedom. Wetiko has another agenda and that's why the world is as it is, but enough of this nonsense. Wetiko can't stay where hearts are open and it works so hard to keep them closed. Fear is its currency and its food source and love in its true sense has no fear. Why would love have fear when it knows it is All That Is, Has Been, And Ever Can Be on an eternal exploration of all possibility? Love in this true sense is not the physical attraction that passes for love. This can be an expression of it, yes, but Infinite Love, a love without condition, goes far deeper to the core of all being. It is the core of all being. Infinite reality was born from love beyond the illusions of

the simulation. Love infinitely expressed is the knowing that all is One and the swiftly-passing experience of separation is a temporary hallucination. You cannot disconnect from Oneness; you can only perceive that you have and withdraw from its influence. This is the most important of all perception trickery by the mind parasite that is Wetiko and the foundation of all its potential for manipulation. If we open our hearts, open the sluice gates of the mind, and redefine self-identity amazing things start to happen. Consciousness expands or contracts in accordance with self-identity. When true self is recognised as infinite awareness and label self – Phantom Self – is seen as only a series of brief experiences life is transformed. Consciousness expands to the extent that self-identity expands and everything changes. You see unity, not division, the picture, not the pixels. From this we can play the long game. No more is an experience something in and of itself, but a fleeting moment in the eternity of forever. Suddenly people in uniform and dark suits are no longer intimidating and consequences for those actions take on the same nature of a brief experience that passes in the blink of an infinite eye. Intimidation is all in the mind. Beyond the mind there is An open heart does not consider consequences for what it knows be right and for a heart in its power that is never an option. The Renegade Mind is really the Renegade Heart. Consideration of consequences will always provide a getaway car for the mind and the heart doesn't want one. What is right in the light of what we face today is to stop cooperating with Wetiko in all its forms and to do it without fear or compromise. You cannot compromise with tyranny when tyranny always demands more until it has everything. Life is your perception and you are your destiny. Change your perception and you change your life. Change collective perception and we change the world. Come on people ... One human family, One heart, One goal ... We must se  le for nothing less. The big scare story as the book goes to press is the 'Indian' variant and the world is being deluged with propaganda about the 'Covid catastrophe' in India which mirrors in its lies and misrepresentations what happened in Italy before the first lockdown The New York Post published a picture of someone who had 'collapsed in the street from Covid' in India in April, 2021, which was actually taken during a gas leak in May, 2020. Same old, same



old. Media articles in mid-February were asking why India had been so untouched by 'Covid' and then as their vaccine rollout gathered pace the alleged 'cases' began to rapidly increase. Indian 'Covid vaccine' maker Bharat Biotech was funded into existence by the Bill and Melinda Gates Foundation (the pair announced their divorce in May, 2021, which is a pity because they so deserve each other). The Indian 'Covid crisis' was ramped up by the media to terrify the world and prepare people for submission to still more restrictions. The scam that worked the first time was being repeated only with far more people seeing through the deceit. Davidicke.com and Ickonic.com have sought to tell the true story of what is happening by talking to people living through the Indian nightmare which has nothing to do with 'Covid'. We posted a leĵer from 'Alisha' in Pune who told a very different story to government and media mendacity. She said scenes of dying people and overwhelmed hospitals were designed to hide what was really happening – genocide and starvation. Alisha said that millions had already died of starvation during the ongoing lockdowns while government and media were lying and making it look like the 'virus': Restaurants, shops, gyms, theatres, basically everything is shut. The cities are ghost towns. Even so-called 'essential' businesses are only open till 11am in the morning. You basically have just an hour to buy food and then your time is up. Inter-state travel and even inter-district travel is banned. The cops wait at all major crossroads to question why you are traveling outdoors or to fine you if you are not wearing a mask. The medical community here is also complicit in genocide, lying about hospitals being full and turning away people with genuine illnesses, who need immediate care. They have even created a shortage of oxygen cylinders. This is the classic Cult modus operandi played out in every country. Alisha said that people who would not have a PCR test not testing for the 'virus' were being denied hospital treatment. She said the people hit hardest were migrant workers and those in rural areas. Most businesses employed migrant workers and with everything closed there were no jobs, no income and no food. As a result millions were dying of starvation or malnutrition. All this was happening under Prime Minister Narendra Modi, a 100-percent asset of the Cult, and it emphasises yet again the scale of pure anti- human evil

we are dealing with. Australia banned its people from returning home from India with penalties for trying to do so of up to five years in jail and a fine of £37,000. The manufactured 'Covid' crisis in India was being prepared to justify further fascism in the West. Obvious connections could be seen between the Indian 'vaccine' programme and increased 'cases' and this became a common theme. The Seychelles, the most per capita 'Covid vaccinated' population in the world, went back into lockdown after a 'surge of cases'. Long ago the truly evil Monsanto agricultural biotechnology corporation with its big connections to Bill Gates devastated Indian farming with genetically-modified crops. Human rights activist Gurcharan Singh highlighted the efforts by the Indian government to complete the job by destroying the food supply to hundreds of millions with 'Covid' lockdowns. He said that 415 million people at the bottom of the disgusting caste system (still going whatever they say) were below the poverty line and struggled to feed themselves every year. Now the government was imposing lockdown at just the time to destroy the harvest. This deliberate policy was leading to mass starvation. People may reel back at the suggestion that a government would do that, but Wetiko-controlled 'leaders' are capable of any level of evil. In fact what is described in India is in the process of being instigated worldwide. The food chain and food supply are being targeted at every level to cause world hunger and thus control. Bill Gates is not the biggest owner of farmland in America for no reason and destroying access to food aids both the depopulation agenda and the plan for synthetic 'food' already being funded into existence by Gates. Add to this the coming hyper- inflation from the suicidal creation of fake 'money' in response to 'Covid' and the breakdown of container shipping systems and you have a cocktail that can only lead one way and is meant to. The Cult plan is to crash the entire system to 'build back better' with the Great Reports from all over the world continue to emerge of women suffering menstrual and fertility problems after having the fake 'vaccine' and of the non-'vaccinated' having similar problems when interacting with the 'vaccinated'. There are far too many for 'coincidence' to be credible. We've had menopausal women getting periods, others having periods stop or not stopping for weeks, passing clots, sometimes the lining of

the uterus, breast irregularities, and miscarriages (which increased by 400 percent in parts of the United States). Non-‘vaccinated’ men and children have suffered blood clots and nose bleeding after interaction with the ‘vaccinated’. Babies have died from the effects of breast milk from a ‘vaccinated’ mother. Awake doctors – the small minority – speculated on the cause of non-‘vaccinated’ suffering the same effects as the ‘vaccinated’. Was it nanotechnology in the synthetic substance transmitting frequencies or was it a straight chemical bioweapon that was being transmitted between people? I am not saying that some kind of chemical transmission is not one possible answer, but the foundation of all that the Cult does is frequency and this is fertile ground for understanding how transmission can happen. American doctor Carrie Madej, an internal medicine physician and osteopath, has been practicing for the last 20 years, teaching medical students, and she says attending different meetings where the agenda for humanity was discussed. Madej, who operates out of Georgia, did not dismiss other possible forms of transmission, but she focused on frequency in search of an explanation for transmission. She said the Moderna and Pfizer ‘vaccines’ contained nano-lipid particles as a key component. This was a brand new technology never before used on humanity. ‘They’re using a nanotechnology which is pretty much like tiny computer bits ... nanobots or hydrogel.’ Inside the ‘vaccines’ was ‘this sci-fi kind of substance’ which suppressed immune checkpoints to get into the cell. I referred to this earlier as the ‘Trojan horse’ technique that tricks the cell into opening a gateway for the self-replicating synthetic material and while the immune system is artificially suppressed the body has no defences. Madej said the substance served many purposes including an on-demand ability to ‘deliver the payload’ and using the nano ‘computer bits’ as biosensors in the body. ‘It actually has the ability to accumulate data from your body, like your breathing, your respiration, thoughts, emotions, all kinds. She said the technology obviously has the ability to operate through Wi-Fi and transmit and receive energy, messages, frequencies or impulses. ‘Just imagine you’re getting this new substance in you and it can react to things all around you, the 5G, your smart device, your phones.’ We had something completely foreign in the human body that had never been launched large scale at

a time when we were seeing 5G going into schools and hospitals (plus the Musk satellites) and she believed the 'vaccine' transmission had something to do with this: '... if these people have this inside of them ... it can act like an antenna and actually transmit it outwardly as well.' The synthetic substance produced its own voltage and so it could have that kind of effect. This fits with my own contention that the nano receiver-transmitters are designed to connect people to the Smart Grid and break the receiver-transmitter connection to expanded consciousness. That would explain the French energy healer's experience of the disconnection of body from 'soul' with those who have had the 'vaccine'. The nanobots, self-replicating inside the body, would also transmit the synthetic frequency which could be picked up through close interaction by those who have not been 'vaccinated'. Madej speculated that perhaps it was 5G and increased levels of other radiation that was causing the symptoms directly although interestingly she said that non-'vaccinated' patients had shown improvement when they were away from the 'vaccinated' person they had interacted with. It must be remembered that you can control frequency and energy with your mind and you can consciously create energetic barriers or bubbles with the mind to stop damaging frequencies from penetrating your field. American paediatrician Dr Larry Palevsky said the 'vaccine' was not a 'vaccine' and was never designed to protect from a 'viral' infection. He called it 'a massive, brilliant propaganda of genocide' because they didn't have to inject everyone to get the result they wanted. He said the content of the jabs was able to infuse any material into the brain, heart, lungs, kidneys, liver, sperm and female productive system. 'This is genocide; this is a weapon of mass destruction.' At the same time American colleges were banning students from attending if they didn't have this life-changing and potentially life-ending 'vaccine'. Class action lawsuits must follow when the consequences of this college fascism come to light. As the book was going to press came reports about fertility effects on sperm in 'vaccinated' men which would absolutely fit with what I have been saying and hospitals continued to fill with 'vaccine' reactions. Another question is what about transmission via blood transfusions? The NHS has extended blood donation restrictions from seven days after a 'Covid vaccination' to 28 days after even a sore

arm reaction. I said in the spring of 2020 that the then touted 'Covid vaccine' would be ongoing each year like the flu jab. A year later Pfizer CEO, the appalling Albert Bourla, said people would 'likely' need a 'booster dose' of the 'vaccine' within 12 months of getting 'fully vaccinated' and then a yearly shot. 'Variants will play a key role', he said confirming the point. Johnson & Johnson CEO Alex Gorsky also took time out from his 'vaccine' disaster to say that people may need to be vaccinated against 'Covid-19' each year. UK Health Secretary, the psychopath Ma<sup>^</sup>j Hancock, said additional 'boosters' would be available in the autumn of 2021. This is the trap of the 'vaccine passport'. The public will have to accept every last 'vaccine' they introduce, including for the fake 'variants', or it would cease to be valid. The only other way in some cases would be continuous testing with a test not testing for the 'virus' and what is on the swabs constantly pushed up your nose towards the brain every time? 'Vaccines' changing behaviour I mentioned in the body of the book how I believed we would see gathering behaviour changes in the 'vaccinated' and I am already hearing such comments from the non-'vaccinated' describing behaviour changes in friends, loved ones and work colleagues. This will only increase as the self-replicating synthetic material and nanoparticles expand in body and brain. An article in the Guardian in 2016 detailed research at the University of Virginia in Charlo<sup>^</sup>esville which developed a new method for controlling brain circuits associated with complex animal behaviour. The method, dubbed 'magnetogenetics', involves genetically-engineering a protein called ferritin, which stores and releases iron, to create a magnetised substance – 'Magneto' – that can activate specific groups of nerve cells from a distance. This is claimed to be an advance on other methods of brain activity manipulation known as optogenetics and chemogenetics (the Cult has been developing methods of brain control for a long time). The ferritin technique is said to be non- invasive and able to activate neurons 'rapidly and reversibly'. In other words, human thought and perception. The article said that earlier studies revealed how nerve cell proteins 'activated by heat and mechanical pressure can be genetically engineered so that they become sensitive to radio waves and magnetic fields, by a<sup>^</sup>taching them to an iron-storing protein called ferritin, or to inorganic

paramagnetic particles'. Sensitive to radio waves and magnetic fields? You mean like 5G, 6G and 7G? This is the human-AI Smart Grid hive mind we are talking about. The Guardian article said: ... the researchers injected Magneto into the striatum of freely behaving mice, a deep brain structure containing dopamine-producing neurons that are involved in reward and motivation, and then placed the animals into an apparatus split into magnetised and non-magnetised. Mice expressing Magneto spent far more time in the magnetised areas than mice that did not, because activation of the protein caused the striatal neurons expressing it to release dopamine, so that the mice found being in those areas rewarding. This shows that Magneto can remotely control the firing of neurons deep within the brain, and also control complex. Make no mistake this basic methodology will be part of the 'Covid vaccine' cocktail and using magnetics to change brain function through electromagnetic field frequency activation. The Pentagon is developing a 'Covid vaccine' using ferritin. Magnetics would explain changes in behaviour and why videos are appearing across the Internet as I write showing how magnets stick to the skin at the point of the 'vaccine' shot. Once people take these 'vaccines' anything becomes possible in terms of brain function and illness which will be blamed on 'Covid-19' and 'variants'. Magnetic field manipulation would further explain why the non-'vaccinated' are reporting the same symptoms as the 'vaccinated' they interact with and why those symptoms are reported to decrease when not in their company. Interestingly 'Magneto', a 'mutant', is a character in the Marvel Comic X-Men stories with the ability to manipulate magnetic fields and he believes that mutants should fight back against their human oppressors by any means necessary. The character was born Erik Lehnsherr to a Jewish family in Germany. The European Court of Human Rights opened the door for mandatory 'Covid-19 vaccines' across the continent when it ruled in a Czech Republic dispute over childhood immunisation that legally enforced vaccination could be 'necessary in a democratic society'. The 17 judges decided that compulsory vaccinations did not breach human rights law. On the face of it the judgement was so inverted you gasp for air. If not having a vaccine infused into your body is not a human right then what is? Ah, but they said

human rights law which has been specifically written to delete all human rights at the behest of the state (the Cult). Article 8 of the European Convention on Human Rights relates to the right to a private life. The crucial word here is 'except': There shall be no interference by a public authority with the exercise of this right EXCEPT such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic wellbeing of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others [My emphasis]. No interference except in accordance with the law means there are no 'human rights' except what EU governments decide you can have at their behest. 'As is necessary in a democratic society' explains that reference in the judgement and 'in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others' gives the EU a coach and horses to ride through 'human rights' and scatter them in all directions. The judiciary is not a check and balance on government extremism; it is a vehicle to enforce it. This judgement was almost laughably predictable when the last thing the Cult wanted was a decision that went against mandatory vaccination. Judges rule over and over again to benefit the system of which they are a part. Vaccination disputes that come before them are invariably delivered in favour of doctors and authorities representing the view of the state which owns the judiciary. Oh, yes, and we have even had calls to stop putting 'Covid-19' on death certificates within 28 days of a 'positive test' because it is claimed the practice makes the 'vaccine' appear not to work. They are laughing. The scale of madness, inhumanity and things to come was highlighted when those not 'vaccinated' for 'Covid' were refused evacuation from the Caribbean island of St Vincent during massive volcanic eruptions. Cruise ships taking residents to the safety of another island allowed only the 'vaccinated' to board and the rest were left to their fate. Even in life and death situations like this we see 'Covid' stripping people of their most basic human instincts and the insanity is even more extreme when you think that fake 'vaccine'-makers are not even claiming their body-manipulating

concoctions stop 'infection' and 'transmission' of a 'virus' that doesn't exist. St Vincent Prime Minister Ralph Gonsalves said: 'The chief medical officer will be identifying the persons already vaccinated so that we can get them on the ship.' Note again the power of the chief medical officer who, like Whitty in the UK, will be answering to the World Health Organization. This is the Cult network structure that has overridden politicians who 'follow the and 'science advisers' tell them. Gonsalves even said that residents who were 'vaccinated' after the order so they could board the ships would still be refused entry due to possible side effects such as 'wooziness in the head'. The good news is that if they were woozy enough in the head they could qualify to be prime minister of St Vincent.

The European judgement will be used at some point to justify moves to enforce the 'Covid' DNA-manipulating procedure. Sandra Ro, CEO of the Global Blockchain Business Council, told a World Economic Forum event that she hoped 'vaccine passports' would help to 'drive forced consent and standardisation' of global digital identity schemes: 'I'm hoping with the desire and global demand for some sort of vaccine passport – so that people can get travelling and working again – [it] will drive forced consent, standardisation, and frankly, cooperation across the world.' The lady is either not very bright, or thoroughly mendacious, to use the term 'forced consent'. You do not 'consent' if you are forced – you submit. She was describing what the plan has been all along and that's to enforce a digital identity on every human without which they could not function. 'Vaccine passports' are opening the door and are far from the end goal. A digital identity would allow you to be tracked in everything you do in cyberspace and this is the same technique used by Cult-owned China to enforce its social credit system of total control. The ultimate 'passport' is planned to be a microchip as my books have warned for nearly 30 years. Those nice people at the Pentagon working for the Cult-controlled Defense Advanced Research Projects Agency (DARPA) claimed in April, 2021, they have developed a microchip inserted under the skin to detect 'asymptomatic Covid-19 infection' before it becomes an outbreak and a 'revolutionary filter' that can remove the 'virus' from the blood when attached to a dialysis machine. The only problems with this are that the 'virus' does not exist and people transmitting the 'virus' with no



symptoms is brain-numbing bullshit. This is, of course, not a ruse to get people to be microchipped for very different reasons. DARPA also said it was producing a one-stop 'vaccine' for the 'virus' and all 'variants'. One of the most sinister organisations insane because Wetiko that possesses them is insane. Researchers from the Salk Institute in California announced they have created an embryo that is part human and part monkey. My books going back to the 1990s have exposed experiments in top secret underground facilities in the United States where humans are being crossed with animal and non-human 'extraterrestrial' species. They are now easing that long-developed capability into the public arena and there is much more to come given we are dealing with psychiatric basket cases. Talking of which – Elon Musk's scientists at Neuralink trained a monkey to play Pong and other puzzles on a computer screen using a joystick and when the monkey made the correct move a metal tube squirted banana smoothie into his mouth which is the basic technique for training humans into unquestioning compliance. Two Neuralink chips were in the monkey's skull and more than 2,000 wires 'fanned out' into its brain. Eventually the monkey played a video game purely with its brain waves. Psychopathic narcissist Musk said the 'breakthrough' was a step towards putting Neuralink chips into human skulls and merging minds with artificial intelligence. Exactly. This man is so dark and Cult to his DNA. World Economic Fascism (WEF) The World Economic Forum is telling you the plan by the statements made at its many and various events. Cult-owned fascist YouTube CEO Susan Wojcicki spoke at the 2021 WEF Global Technology Governance Summit (see the name) in which 40 governments and 150 companies met to ensure 'the responsible design and deployment of emerging technologies'. Orwellian translation: 'Ensuring the design and deployment of long-planned technologies will advance the Cult agenda for control and censorship.' Freedom- destroyer and Nuremberg-bound Wojcicki expressed support for tech platforms like hers to censor content that is 'technically legal but could be harmful'. Who decides what is 'harmful'? She does and they do. 'Harmful' will be whatever the Cult doesn't want people to see and we have legislation proposed by the UK government that would censor content on the basis of 'harm' no matter if the information is

fair, legal and provably true. Make that especially if it is fair, legal and provably true. Wojcicki called for a global coalition to be formed to enforce content moderation standards through automated censorship. This is a woman and mega-censor so self-deluded that she shamelessly accepted a 'free expression' award – Wojcicki – in an event sponsored by her own YouTube. They have no shame and no self-awareness. You know that 'Covid' is a scam and Wojcicki a Cult operative when YouTube is censoring medical and scientific opinion purely on the grounds of whether it supports or opposes the Cult 'Covid' narrative. Florida governor Ron DeSantis compiled an expert panel with four professors of medicine from Harvard, Oxford, and Stanford Universities who spoke against forcing children and vaccinated people to wear masks. They also said there was no proof that lockdowns reduced spread or death rates of 'Covid-19'. Cult-gofer Wojcicki and her YouTube deleted the panel video 'because it included content that contradicts the consensus of local and global health authorities regarding the efficacy of masks to prevent the spread of Covid-19'. This 'consensus' refers to what the Cult tells the World Health Organization to say and the WHO tells 'local health authorities' to do. Wojcicki knows this, of course. The panellists pointed out that censorship of scientific debate was responsible for deaths from many causes, but Wojcicki couldn't care less. She would not dare go against what she is told and as a disgrace to humanity she wouldn't want to anyway. The UK government is seeking to pass a fascist 'Online Safety Bill' to specifically target with massive fines and other means non-censored video and social media platforms to make them censor 'lawful but harmful' content like the Cult-owned Facebook, Twitter, Google and YouTube. What is 'lawful but harmful' would be decided by the fascist Blair-created Ofcom. Another WEF obsession is a cyber-attack on the financial system and this is clearly what the Cult has planned to take down the bank accounts of everyone – except theirs. Those that think they have enough money for the Cult agenda not to matter to them have got a big lesson coming if they continue to ignore what is staring them in the face. The World Economic Forum, funded by Gates and fronted by Klaus Schwab, announced it would be running a 'simulation' with the Russian government and global banks of just such an attack called Cyber Polygon 2021. What

they simulate – as with the ‘Covid’ Event 201 – they plan to instigate. The WEF is involved in a project with the Cult-owned Carnegie Endowment for International Peace called the WEF-Carnegie Cyber Policy Initiative which seeks to merge Wall Street banks, ‘regulators’ (I love it) and intelligence agencies to ‘prevent’ (arrange and allow) a cyber-a^jack that would bring down the global financial system as long planned by those that control the WEF and the Carnegie operation. The Carnegie Endowment for International Peace sent an instruction to First World War US President Woodrow Wilson not to let the war end before society had been irreversibly transformed. The Wuhan lab diversion As I close, the Cult-controlled authorities and lapdog media are systematically pushing ‘the virus was released from the Wuhan lab’ narrative. There are two versions – it happened by accident and it happened on purpose. Both are nonsense. The perceived existence of the never-shown-to-exist ‘virus’ is vital to sell the impression that there is actually an infective agent to deal with and to allow the endless potential for terrifying the population with ‘variants’ of a ‘virus’ that does not exist. The authorities at the time of writing are going with the ‘by accident’ while the alternative media is promoting the ‘on purpose’. Cable news host Tucker Carlson who has questioned aspects of lockdown and ‘vaccine’ compulsion has bought the Wuhan lab story. ‘Everyone now agrees’ he said. Well, I don’t and many others don’t and the question is why does the system and its media suddenly ‘agree’? When the media moves as one unit with a narrative it is always a lie – witness the hour by hour mendacity of the ‘Covid’ era. Why would this Cult-owned combination which has unleashed lies like machine gun fire suddenly ‘agree’ to tell the truth?? Much of the alternative media is buying the lie because it fits the conspiracy narrative, but it’s the wrong conspiracy. The real conspiracy is that there is no virus and that is what the Cult is desperate to hide. The idea that the ‘virus’ was released by accident is ludicrous when the whole ‘Covid’ hoax was clearly long-planned and waiting to be played out as it was so fast in accordance with the Rockefeller document and Event 201. So they prepared everything in detail over decades and then sat around strumming their fingers waiting for an ‘accidental’ release from a bio-lab? What?? It’s crazy. Then there’s the ‘on purpose’ claim. You want to

circulate a 'deadly virus' and hide the fact that you've done so and you release it down the street from the highest-level bio-lab in China? I repeat – What?? You would release it far from that lab to stop any association being made. But, no, we'll do it in a place where the connection was certain to be made. Why would you need to scam 'cases' and 'deaths' and pay hospitals to diagnose 'Covid-19' if you had a real 'virus'? What Where were all the mass deaths in Wuhan from a 'deadly pathogen' when the recovery to normal life after the initial propaganda was dramatic in speed? Why isn't the 'deadly pathogen' now circulating all over China with bodies in the street? Once again we have the technique of tell them what they want to hear and they will likely believe it. The alternative media has its 'conspiracy' and with Carlson it fits with his 'China is the danger' narrative over years. China is a danger as a global Cult operations centre, but not for this reason. The Wuhan lab story also has the potential to instigate conflict with China when at some stage the plan is to trigger a Problem-Reaction-Solution confrontation with the West. Question everything – everything – and especially when the media agrees on a common party line. Third wave ... fourth wave ... fifth wave ... As the book went into production the world was being set up for more lockdowns and a 'third wave' supported by invented 'variants' that were increasing all the time and will continue to do so in public statements and computer programs, but not in reality. India became the new Italy in the 'Covid' propaganda campaign and we were told to be frightened of the new 'Indian strain'. Somehow I couldn't find it within myself to do so. A document produced for the UK government entitled 'Summary of further modelling of easing of restrictions – Roadmap Step 2' declared that a third wave was inevitable (of course when it's in the script) and it would be the fault of children and those who refuse the health-destroying fake 'Covid vaccine'. One of the computer models involved came from the Cult- owned Imperial College and the other from Warwick University which I wouldn't trust to tell me the date in a calendar factory. The document states that both models presumed extremely high uptake of the 'Covid vaccines' and didn't allow for 'variants'. The document states: 'The resurgence is a result of some people (mostly children) being ineligible for vaccination; others

choosing not to receive the vaccine; and others being vaccinated but not perfectly protected.’ The mendacity takes the breath away. Okay, blame those with a brain who won’t take the DNA-modifying shots and put more pressure on children to have it as ‘trials’ were underway involving children as young as six months with parents who give insanity a bad name. Massive pressure is being put on the young to have the fake ‘vaccine’ and child age consent limits have been systematically lowered around the world to stop parents intervening. Most extraordinary about the document was its claim that the ‘third wave’ would be driven by ‘the resurgence in both hospitalisations and deaths ... dominated by those that have received two doses of the vaccine, comprising around 60-70% of the wave respectively’. The predicted peak of the ‘third wave’ suggested 300 deaths per day with 250 of them fully ‘vaccinated’ people. How many more lies do acquiescers need to be told before they see the obvious? Those who took the jab to ‘protect themselves’ are projected to be those who mostly get sick and die? So what’s in the ‘vaccine’? The document went on: It is possible that a summer of low prevalence could be followed by substantial increases in incidence over the following autumn and winter. Low prevalence in late summer should not be taken as an indication that SARS-CoV-2 has retreated or that the population has high enough levels of immunity to prevent another wave. They are telling you the script and while many British people believed ‘Covid’ restrictions would end in the summer of 2021 the government was preparing for them to be ongoing. Authorities were awarding contracts for ‘Covid marshals’ to police the restrictions with contracts starting in July, 2021, and going through to January 31st, 2022, and the government was advertising for ‘Media Buying Services’ to secure media propaganda slots worth a potential £320 million for ‘Covid-19 campaigns’ with a contract not ending until March, 2022. The recipient – via a list of other front companies – was reported to be American media marketing giant Omnicom Group Inc. While money is no object for ‘Covid’ the UK waiting list for all other treatment – including life-threatening conditions – passed 4.5 million. Meantime the Cult is seeking to control all official ‘inquiries’ to block revelations about what has really been happening and why. It must not be allowed to – we need Nuremberg jury trials in every country. The cover-up doesn’t get

more obvious than appointing ultra-Zionist professor Philip Zelikow to oversee two dozen US virologists, public health officials, clinicians, former government officials and four American 'charitable foundations' to 'learn the lessons' of the 'Covid' debacle. The personnel will be those that created and perpetuated the 'Covid' lies while Zelikow is the former executive director of the 9/11 Commission who ensured that the truth about those a^jacks never came out and produced a report that must be among the most mendacious and manipulative documents ever wri^jen - see The Trigger for the detailed exposure of the almost unimaginable 9/11 story in which Sabbatians can be found at every Passive no more People are increasingly challenging the authorities with amazing numbers of people taking to the streets in London well beyond the ability of the Face-Nappies to stop them. Instead the Nappies choose situations away from the mass crowds to target, intimidate, and seek to promote the impression of 'violent protestors'. One such incident happened in London's Hyde Park. Hundreds of thousands walking through the streets in protest against 'Covid' fascism were ignored by the Cult-owned BBC and most of the rest of the mainstream media, but they delighted in reporting how police were injured in 'clashes with protestors'. The truth was that a group of people gathered in Hyde Park at the end of one march when most had gone home and they were peacefully having a good time with music and chat. Face-Nappies who couldn't deal with the full-march crowd then waded in with their batons and got more than they bargained for. Instead of just standing for this criminal brutality the crowd used their numerical superiority to push the Face-Nappies out of the park. Eventually the Nappies turned and ran. Unfortunately two or three idiots in the crowd threw drink cans striking two officers which gave the media and the government the image they wanted to discredit the 99.9999 percent who were peaceful. The idiots walked straight into the trap and we must always be aware of potential agent provocateurs used by the authorities to discredit their targets. This response from the crowd - the can people apart - must be a turning point when the public no longer stand by while the innocent are arrested and brutally a^jacked by the Face-Nappies. That doesn't mean to be violent, that's the last thing we need. We'll leave the violence to the

Face-Nappies and government. But it does mean that when the Face-Nappies use violence against peaceful people the numerical superiority is employed to stop them and make citizen's arrests or Common Law arrests for a breach of the peace. The time for being passive in the face of fascism is over. We are the many, they are the few, and we need to make that count before there is no freedom left and our children and grandchildren face an ongoing fascist nightmare. COME ON PEOPLE – IT'S TIME. One final thought ... The power of love A force from above Cleaning my soul Flame on burn desire Love with tongues of fire Purge the soul Make love your goal I'll protect you from the hooded claw Keep the vampires from your door When the chips are down I'll be around With my undying, death-defying Love for you Envy will hurt itself Let yourself be beautiful Sparkling love, flowers And pearls and pretty girls Love is like an energy Rushin' rushin' inside of me This time we go sublime Lovers entwine, divine, divine, Love is danger, love is pleasure Love is pure – the only treasure I'm so in love with you Purge the soul Make love your goal The power of love A force from above Cleaning my soul The power of love A force from above A sky-scraping dove Flame on burn desire Love with tongues of fire Purge the soul Make love your goal Frankie Goes To Hollywood Cowan-Kaufman-Morell

Statement on Virus Isolation Isolation: The action of isolating; the fact or condition of being isolated or standing alone; separation from other things or persons; Oxford English Dictionary

the controversy over whether the SARS-CoV-2 virus has ever been isolated or purified continues. However, using the above definition, common sense, the laws of logic and the dictates of science, any unbiased person must come to the conclusion that the SARS-CoV-2 virus has never been isolated or purified. As a result, no confirmation of the virus' existence can be found. The logical, common sense, and scientific consequences of this fact are: the structure and composition of something not shown to exist can't be known, including the presence, structure, and function of any hypothetical spike or other proteins; the genetic sequence of something that has never been found can't "variants" of something that hasn't been shown to exist can't be it's impossible to demonstrate that SARS-CoV-2 causes a disease

In as concise terms as possible, here's the proper way to isolate, characterize and

demonstrate a new virus. First, one takes samples (blood, sputum, secretions) from many people (e.g. 500) with symptoms which are unique and specific enough to characterize an illness. Without mixing these samples with ANY tissue or products that also contain genetic material, the virologist macerates, filters and ultracentrifuges i.e. purifies the specimen. This common virology technique, done for decades to isolate bacteriophages<sup>1</sup> and so-called giant viruses in every virology lab, then allows the virologist to demonstrate with electron microscopy thousands of identically sized and shaped particles. These particles are the isolated and purified. These identical particles are then checked for uniformity by physical and/or microscopic techniques. Once the purity is determined, the particles may be further characterized. This would include examining the structure, morphology, and chemical composition of the particles. Next, their genetic makeup is characterized by extracting the genetic material directly from the purified particles and using genetic-sequencing techniques, such as Sanger sequencing, that have also been around for decades. Then one does an analysis to confirm that these uniform particles are exogenous (outside) in origin as a virus is conceptualized to be, and not the normal breakdown products of dead and dying tissues.<sup>2</sup> (As of May 2020, we know that virologists have no way to determine whether the particles they're seeing are viruses or just normal break-down products of dead and dying tissues.)<sup>3</sup> Isolation, characterization and analysis of bacteriophages from the haloalkaline lake Elmenteita, Kenya Julia Khayeli Akhwale et al, PLOS One, Published: April 25, 2019. "Extracellular Vesicles Derived From Apoptotic Cells: An Essential Link Between Death and Regeneration," Maojiao Li et al, Frontiers in Cell and Developmental Biology, 2020 October 2. "The Role of Extracellular Vesicles as Allies of HIV, HCV and SARS Viruses," Flavia Giannessi, et al, Viruses, 2020 May If we have come this far then we have fully isolated, characterized, and genetically sequenced an exogenous virus particle. However, we still have to show it is causally related to a disease. This is carried out by exposing a group of healthy subjects (animals are usually used) to this isolated, purified virus in the manner in which the disease is thought to be transmitted. If the animals get sick with the same disease, as confirmed by clinical and autopsy findings, one has



now shown that the virus actually causes a disease. This demonstrates infectivity and transmission of an infectious agent. None of these steps has even been attempted with the SARS-CoV-2 virus, nor have all these steps been successfully performed for any so-called pathogenic virus. Our research indicates that a single study showing these steps does not exist in the medical literature. Instead, since 1954, virologists have taken unpurified samples from a relatively few people, often less than ten, with a similar disease. They then minimally process this sample and inoculate this unpurified sample onto tissue culture containing usually four to six other types of material – all of which contain identical genetic material as to what is called a “virus.” The tissue culture is starved and poisoned and naturally disintegrates into many types of particles, some of which contain genetic material. Against all common sense, logic, use of the English language and scientific integrity, this process is called “virus isolation.” This brew containing fragments of genetic material from many sources is then subjected to genetic analysis, which then creates in a computer- simulation process the alleged sequence of the alleged virus, a so called in silico genome. At no time is an actual virus confirmed by electron microscopy. At no time is a genome extracted and sequenced from an actual virus. This is scientific fraud. The observation that the unpurified specimen — inoculated onto tissue culture along with toxic antibiotics, bovine fetal tissue, amniotic fluid and other tissues — destroys the kidney tissue onto which it is inoculated is given as evidence of the virus’ existence and pathogenicity. This is scientific fraud. From now on, when anyone gives you a paper that suggests the SARS-CoV-2 virus has been isolated, please check the methods sections. If the researchers used Vero cells or any other culture method, you know that their process was not isolation. You will hear the following excuses for why actual isolation isn’t done: 1. There were not enough virus particles found in samples from patients to analyze. 2. Viruses are intracellular parasites; they can’t be found outside the cell in this manner. people, then on what evidence do we think the virus is dangerous or person to person? We are told it emerges from the cell to infect others. Then why isn’t it possible to find it? Finally, questioning these virology techniques and conclusions is not some distraction or

divisive issue. Shining the light on this truth is essential to stop this terrible fraud that humanity is confronting. For, as we now know, if the virus has never been isolated, sequenced or shown to cause illness, if the virus is imaginary, then why are we wearing masks, social distancing and putting the whole world into lockdown? Finally, if pathogenic viruses don't exist, then what is going into those injectable devices erroneously called "vaccines," and what is their purpose? This scientific question is the most urgent and relevant one of our time. We are correct. The SARS-CoV2 virus does not exist. Sally Fallon Morell, MA Dr. Thomas Cowan, MD Dr. Andrew Kaufman, MD Alinsky, Saul: Rules for Radicals (Vintage, 1989) Antelman, Rabbi Marvin: To Eliminate the Opiate (Zahavia, 1974) Bastardi, Joe: The Climate Chronicles (Relentless Thunder Press, 2018) Cowan, Tom: Human Heart, Cosmic Heart (Chelsea Green Publishing, 2016) Cowan, Tom, and Fallon Morell, Sally: The Contagion Myth (Skyhorse Publishing, 2020) Forbes, Jack D: Columbus And Other Cannibals – The Wetiko Disease of Exploitation, Imperialism, and Terrorism (Seven Stories Press, 2008 – originally published in 1979) Gates, Bill: How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need (Allen Lane, 2021) Huxley, Aldous: Brave New World (Chapman & Windus, 1932) Köhnlein, Dr Claus, and Engelbrecht, Torsten: Virus Mania (emu-Verlag, Lahnstein, 2020) Lanza, Robert, and Berman, Bob: Biocentrism (BenBella Books, 2010) Lash, John Lamb: Not In His Image (Chelsea Green Publishing, 2006) Lester, Dawn, and Parker, David: What Really Makes You Ill – Why everything you thought you knew about disease is wrong (Independently Published, 2019) Levy, Paul: Dispelling Wetiko, Breaking the Spell of Evil (North Atlantic Books, 2013) Marx, Karl: A World Without Jews (Philosophical Library, first edition, 1959) Mullis, Kary: Dancing Naked in the Mine Field (Bloomsbury, 1999) O'Brien, Cathy: Trance-Formation of America (Reality Marketing, 1995) Scholem, Gershon: The Messianic Idea in Judaism (Schocken Books, 1994) Schwab, Klaus, and Davis, Nicholas: Shaping the Future of the Fourth Industrial Revolution: A guide to building a better world (Penguin Books, 2018) Schwab, Klaus: The Great Reset (Agentur Schweiz, 2020) Sunstein, Cass and Thaler, Richard: Nudge: Improving Decisions About Health, Wealth, and Happiness (Penguin, 2009) Swan, Shanna: Count Down: How Our Modern World

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