Torah, Science and Evolution

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Note: When we quote evolutionists below, this does not mean that they subscribe to our views. We quote their words to show that they themselves admit that there are problems with their theories. Also when they talk about the assumed billions of years of evolution, this does not mean that their theories about the age of the universe and its origin are sound. Their cosmology (*cosmic evolution*) and dating methods are built on untested assumptions and large extrapolations beyond the empirical data. A discussion of their theories of the origin of the universe is outside the scope of this article.[1] In this article, we address the origin of first life from dead chemicals (*chemical evolution*) and the subsequent development of life from a primitive precursor (*biological evolution*).

Contents

Creation

The first few chapters of the Torah describe how the organized complexity of life came about. During the 7-day creation week, Hashem brought into existence *ex nihilo* (יש מאין) the universe including space, time and the very laws of nature. Subsequently, He fashioned the galaxies of stars, our solar system with the sun and the moon, and ultimately the earth as an exquisite habitat fine-tuned for life and discovery. On the 6th day, man is created in the divine image. This ends the phase of meta-natural creation (בריאה) in which Hashem brings forth novel entities outside the laws of nature currently in operation.[2]

On the 7th day (שבת), He rested. In this era, God sustains and supervises creation (הנהגה). Shabbat commemorates the transition from בריאה to הנהגה.

> Remember the Sabbath day to sanctify it. … For in six days Hashem made the heaven and earth and all that is in it, the sea and all that is in them, and He rested on the seventh day (*Shemos* 20:8-12).

From that moment in time, the world and the laws of nature operate in an orderly and stable fashion under His supervision. The order of creation makes the world intelligible, making possible the modern scientific enterprise. Stunning new scientific information has added to our awareness that enormous intelligent agency is implicated. We are here by design.

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[1] See http://www.toriah.org/science/big-bang/big-bang.pdf.

[2] The 7-day creation week is essentially meta-natural: "On each day of the six day creation week, novel entities were formed *outside of the laws of nature currently in operation*, and on the seventh day (Shabbos) the state of the world become lasting and established just as it is at present" (Rambam, *Moreh Nevuchim*, 1:67). Shabbos is the demarcation point between meta-natural creation and the natural operation of the universe. This is one of the reasons why theistic evolution (the idea that God is behind evolution) contradicts fundamental principles of Torah.

רמב"ם מ"נ א:סז : בכל יום מן הששה היו מתחדשים בו חידושות מחוץ לטבע הזה המצוי עתה בכללותה, ובוים השביעי התמיד הדבר ונתיצב כפי שהוא עתה.

Evolution

By contrast, evolutionists claim that life came about by unguided processes that did not have us in mind.[3] They insist that the appearance of design is an illusion and that natural processes like random mutations in the genes and natural selection have actually produced the wonders of the living world including such organs as wings, eyes and the mammalian brain. This grand claim is called the *blind watchmaker thesis*. "In Darwin's view the whole point of the theory of evolution by natural selection was that it provided a non-miraculous account of the existence of complex adaptations. … For Darwin, any evolution that had to be helped over the jumps by God was not evolution at all".[4]

The other major claim of evolution is common ancestry. In its most comprehensive form, it states that all of life today comes in a continuous chain of descent from the first primitive living organism (via the blind watchmaker mechanism mentioned above).

The theory of evolution has the enthusiastic support of almost all scientists, the universities, biology textbook writers, the law courts and the media. Many will say with a sort of *emuna peshuta* that it is incontrovertible fact.[5] The *American Association for the Advancement of Science* states: "Evolution remains one of the most substantiated theories in all of science, and serves as the essential framework for modern biology."[6]

1. The fossil record contradicts evolution

Common ancestry by itself does not do away with the need for a Creator. However, there are many problems with the common ancestry thesis. Many believe that the fossil record demonstrates the truth of common ancestry, i.e. they believe that there are sequences of fossils in the geological column that demonstrate gradual change over time for all living things. However, the important transitional fossils needed to demonstrate this thesis go missing in all the important places! Instead, fundamentally new types of animals abruptly appear (and sometimes disappear), thus ruling out common descent as a viable theory.

For example, there are about 36 phyla (basic body plans) in all living things. About 20 of these 27 phyla appear "suddenly" in the Cambrian layers of the geological record without any precursors at all.[7]

As an example, consider the complex trilobite eye. Trilobites suddenly appear in the fossil record with a stunning, complex, multi-lens eye organized like a honeycomb. Physicist Riccardo Levi-Setti observes:

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[3] "Man is the result of a purposeless and materialistic process that did not have him in mind". George Gaylord Simpson, The Meaning of Evolution: A Study of the History of Life and of Its Significance for Man, Yale University Press, New Haven, 1967, p345.

[4] Richard Dawkins (Oxford University) in The Blind Watchmaker:

[5] The term "evolution" is like an accordion. It can expand and contract to the point that it is innocuous. Given its ambiguity, it is sometimes used in such a way that it results in the fallacy of equivocation. Sometimes evolutionists define it as "biological change over time", "changes in the gene frequency" or "descent with modifications". We are different from our parents and such definitions are thus non-controversial. When scientists do quote actual evidence for the Darwinian mechanisms of evolution, it is usually only evidence that supports this non-controversial small scale changes called "micro-evolution". It is common ancestry, and particularly the blind watchmaker thesis that is controversial. There is no empirical evidence to support large scale "macro-evolutionary" changes by unguided processes.

[6] *Science*, 29 September 2006, Vol. 313. no. 5795, pp. 1904 – 1905.

[7] Stephen Meyer, *Darwin's Doubt*, HarperCollins, p32, 2013. P71-72: Using their dating methods, scientists fix the Cambrian Explosion to about 530 million years ago. The 20 phyla appeared in as less than 10 million years. Geologically speaking, 10 million years is "sudden", about 0.2% of earth's assumed 4.5 billion year history (about a minute in a 2 hour day).

> In fact, this doublet is a device so typically associated with human invention that its discovery comes as something of a shock. The realization that trilobites developed and used such devices half a billion years ago makes the shock even greater. And a final discovery —that the refracting interface between the two elements in a trilobite's eyes was designed in accordance with optical constructions worked out by Descartes and Huygens in the mid-seventeenth century—borders on sheer science fiction.[8]

All of a sudden, the trilobite—with its complex eye—is found in the fossil record, without a continuous sequence of prior ancestor fossils that do not have an eye. Here is how Richard Dawkins, a major proponent of evolution, states the problem:

> Eldredge and Gould [famous evolutionists] certainly would agree that some very important gaps really are due to imperfections in the fossil record. *Very big gaps, too*. For example the Cambrian strata of rocks, vintage about 600 million years, are the oldest ones in which we find most of the major invertebrate groups. And we find many of them already *in an advanced state of evolution, the very first time they appear*.
>
> It is as though they were just planted there, without any evolutionary history. Needless to say, this appearance of *sudden* planting has delighted creationists. Evolutionists of all stripes believe, however, that this really does represent a very large gap in the fossil record, a gap that is simply due to the fact that, for some reason, very few fossils have lasted from periods before about 600 million years ago. One good reason might be that many of these animals had only soft parts to their bodies: no shells or bones to fossilize. If you are a creationist you may think that this is special pleading.
>
> My point here is that, when we are talking about gaps of this magnitude, there is no difference whatever in the interpretations of 'punctuationists' and 'gradualists'. Both schools of thought *despise* so-called scientific creationists equally, and both agree that the major gaps are real, that they are true imperfections in the fossil record. Both schools of thought agree that the only alternative explanation of the sudden appearance of so many complex animal types in the Cambrian era is divine creation, and both would reject this alternative. [9]

Here we have one of the most famous biologists (and he is not alone) admitting to the following:

- There are very big gaps in the fossil record.
- Fossils of different types of animals suddenly appear in the rock record in an advanced state of organized complexity the very first time they appear, i.e. without any precursors that gradually lead up to the complex organisms. This contradicts what is predicted by the theory of evolution.
- This "sudden planting" is strong evidence for creation because we are talking about very large gaps in the fossil record.
- Evolutionists have to resort to "special pleading" such as asserting that soft body parts do not fossilize. (The problem is that we have numerous soft body parts in the fossil record).[10]
- The only alternative explanation is divine creation. But scientists despise creationists for saying that the fossil record supports the notion that life is created.

It is not just the Cambrian explosion that presents a problem for evolution:

> You and I are chordates. A chordate is an animal that, for at least some part of its life, has a stiff rod of cartilage along its back. The primary trunk of a chordate's central nervous system runs parallel to this rod. A chordate's mouth is at the front end of its body. Its anus is at the opposite end, near the base of the tail. A chordate is also a bilaterally symmetrical animal, which means that it has a right side and a left side.
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> You and I belong to a subgroup of chordates, *Vertebrata*. Vertebrates are animals in which the stiffening rod be-

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[8] *Trilobites*, 2nd edition, by Riccardo Levi-Setti. The University of Chicago Press, 1993.

[9] Richard Dawkins, The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe without Design Richard Dawkins, Norton, New York, 1986, p229-230. Italics added.

[10] See reference in footnote 7, p.59-60.

> comes segmented during early development into separate, often bony units called vertebrae. Vertebrates also have a brain that is encased in a projective, usually bony shell. Vertebrates have paired appendages: two behind the head region and two closer to the anus. Most vertebrates have teeth, which may be continually replaced by new teeth throughout their lives.
>
> Nobody knows for certain where chordates came from, who their last common ancestor was. *As far as the fossil record goes, for millions of years there were no chordates. Then, suddenly, they appear in the fossil record. Equally as suddenly, after millions of years, vertebrates emerge in the fossil record, replete with lots of vertebrae, paired appendages, and dermal plates that covered not only the head but the entire body*. These vertebrates, however, lack jaws. But after additional millions of years, vertebrates with jaws appear, and they are quickly followed and replaced by jawed vertebrates with teeth. And these vertebrates don't merely have some teeth; they have complete sets of teeth, which are not only spread along the full length of their jaws but also last a lifetime, with waves of new teeth forever replacing the old set of teeth. *Where is the trail of intermediates, of missing links leading from invertebrates to chordates to vertebrates?* …
>
> Given the simplicity of Darwin's theory of evolution, it was reasonable for paleontologists to believe that they should be able to demonstrate with the hard evidence provided by fossils both the thread of life and the gradual transformation of one species into another. *Although paleontologists have, and continue to claim to have, discovered sequences of fossils that do indeed present a picture of gradual change over time, the truth of the matter is that we are still in the dark about the origin of most major groups of organisms.* They appear in the fossil record as Athena did from the head of Zeus—full-blown and raring to go, in contradiction to Darwin's depiction of evolution as resulting from the gradual accumulation of countless infinitesimally minute variations, which, in turn, demands that the fossil record preserve an unbroken chain of transitional forms.[11]

2. Problems with the blind watchmaker thesis

The blind watchmaker thesis is even more problematic than common ancestry. This mechanism is supposedly capable of creating the apparent wonders of design such as wings, eyes and brains without the need for a designer. Is the blind watchmaker thesis true?

The truth and falsity of a scientific thesis should be determined by the evidence, rather than decided by philosophical presupposition ("biases"). Evolutionists use a doctrine called methodological naturalism to bolster their view. This doctrine insists that we must rule out intelligent design *a priori*. Scientists may only refer to unintelligent and undirected mechanisms when they explain the origin of natural phenomena. Evidence is only relevant to determining which natural and undirected process generated life.

This is clearly a mistaken way to approach the search for the truth about origins. Imagine a robot whose only capability is that it is a sensitive metal detector. All it can do is detect metal. We send it into a warehouse filled with metal goods as well as non-metallic goods made out wood, stone and plastic. All it can do is falsely report that the warehouse only has metal objects. Clearly, if we want the truth, we cannot artificially limit what may be out there.

Evolutionists often quote small scale changes ("micro-evolution") such as bacteria that develop resistance to antibiotics, or changes in the size of the beaks of finches—as proof of evolution. But the problem is that the bacteria still remain bacteria, and the finches still remain a species of finch. Pierre Grasse (editor of the 28-volume *Traite de Zoologie*, and Chair of Evolution at Sorbonne University) wrote:

> Bacteria, the study of which has formed a great part of the foundation of genetics and molecular biology, are the organisms which, because of their huge numbers, produce the most mutants. This is why they gave rise to an infinite variety of species, called strains, which can be revealed by breeding or tests. Like *Erophila verna*, bacteria, despite their great production of intraspecific varieties, exhibit a great fidelity to their species. The bacillus *Escherichia coli*, whose mutants have been studied very carefully, is the best example. The reader will agree that it is surpris-

[11] Schwartz, Sudden Origins : Fossils, Genes, and the Emergence of Species, p1-3. Jeffrey H. Schwartz is Professor of Anthropology at the University of Pittsburgh. Emphasis not in the original.

> ing, to say the least, to want to prove evolution and to discover its mechanisms and then to choose as a material for this study a being which practically stabilized a billion years ago!
>
> *What is the use of their unceasing mutations, if they do not change? In sum, the mutations of bacteria and viruses are merely hereditary fluctuations around a median position; a swing to the right, a swing to the left, but no final evolutionary effect.*
>
> Cockroaches, which are one of the most venerable living relict groups, have remained more or less unchanged since the Permian, yet they have undergone as many mutations as Drosophila, a Tertiary insect.[12]

So, are there any testable detailed Darwinian pathways that show macro-evolution on the grand scale? Is there empirical evidence that some entity without an eye developed via the blind watchmaker mechanism into one with an eye?

In his recent book, *The Edge of Evolution*[13], Michael Behe argues that the very evidence produced by Darwinists works against them. For example, malaria and the human immune system have been waging war against each other for over thousands of years. Since the advent of modern science, human beings have developed anti-malarial drugs to try to destroy the malarial organism. Unfortunately for us, the malarial population is huge. The average person infected with malaria has over one trillion malaria cells in his body. Therefore, malaria mutates extremely rapidly. As a result, it has been able to develop resistance to every drug that we've thrown at it. Simple, single point mutations in the malaria parasite are enough to defeat the best malaria drugs.

On the other hand, the human immune system has not been able to evolve a defense against malaria. What happened instead is interesting.

- Sickle cell disease is an unmitigated disaster. But, in Africa, it has a silver lining. The gene that carries the sickle mutation arose in human populations in Africa thousands of years ago. The mutation itself is a single, simple genetic change—nothing at all complicated. Yet despite having a thousand fold more time to deal with the sickle mutation than with modern drugs, the malaria parasite has not found a way to counter it. A tiny change in its host organism has stymied all the evolutionary powers of the mutating malaria parasite.
- Then there is the *E. coli* bacterium. A normal inhabitant of the human intestinal tract, *E. coli* has also been a favourite bacterium to study in the laboratory over the centuries. Over the past decade, *E. coli* has been the subject of the most extensive laboratory evolution study ever conducted. Richard Lenski and his colleagues have released their data on studies of *E. coli* in which they did research on 40,000 generations of E. coli grown in the laboratory. Duplicating about seven times a day, the bug has been gown continuously in flasks over the thousands of generations, equivalent to more than a million years of human evolution. They discovered a few beneficial mutations—but most of those mutations were degenerative in nature. That is to say they involved the loss of genetic information. Apparently throwing away sophisticated but costly molecular machinery saves the bacterium energy.[14] Nothing of remotely similar elegance has been built. The lesson of *E. coli* is that it is easier for evolution to break things than to make things.

The malarial organism is a eukaryote; that is to say, it is an organism having a nucleus. *E. coli* is a bacterium – it is a prokaryote that does not have a nucleus. So we have two fundamentally different forms of life, and in each case the evidence for the efficacy of the Darwinian mechanisms is the same – it just doesn't do very much.

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[12] Evolution of Living Organisms (1977) p.98. Italics added.

[13] Michael J. Behe, *The Edge of Evolution: The Search for the Limits of Darwinism*, (New York, NY: Free Press, 2007).

[14] To give an example, to save the ship from sinking, its captain might throw away some heavy machinery used to guide the ship. The lighter ship will not sink but it has lost its guidance and navigation systems.

> Instead of imagining what the power of random mutation and selection might do, we can look at examples of what it has done. And when we do look at the best, clearest examples, the results are, to say the least, quite modest. Time and again we see that random mutations are incoherent and much more likely to degrade a genome than to add to it — and these are the positively-selected, "beneficial" random mutations.[15]

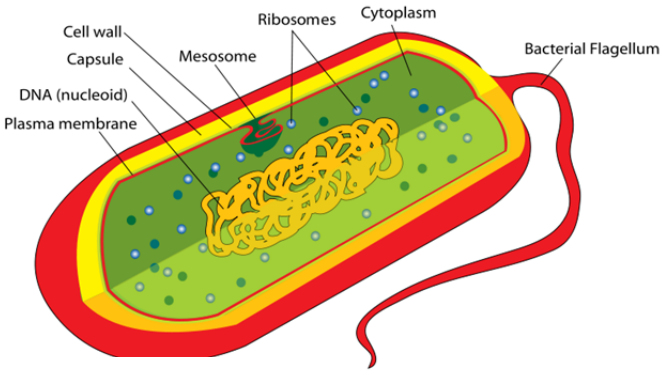
"There is no evidence that Darwinian processes can take the multiple, coherent steps needed to build new molecular machinery . . . that fills the cell".[16] Thus the argument from the ability of organisms to develop drug resistance seems to backfire. Far from providing evidence of the power of the Darwinian mechanisms to produce grand evolutionary change, the experience of scientists with drug resistance in bacteria and malaria reveals the severe limits of those mechanisms.

In their book, *The Anthropic Cosmological Principle*, the physicists John Barrow and Frank Tipler list ten steps needed in the course of human evolution. Included in these steps are things like the development of a DNA-based genetic code, the evolution of aerobic respiration, the evolution of glucose fermentation to pyruvic acid, photosynthesis, and the development of an endoskeleton. Ten steps in the course of human evolution, each of which is so improbable that before it would occur, the sun would have gone through the entire course of its stellar evolution and incinerated the earth. As a result, they report that "there has developed a general consensus among evolutionists that the evolution of intelligent life, comparable in information processing ability to that of Homo sapiens is so improbable that it is unlikely to have occurred on any other planet in the entire visible universe".[17]

Kirschner (Harvard medical school) and Gerhart (Berkeley) are committed to the theory of evolution. Nevertheless, the blurb for their book *The Plausibility of Life* (Yale University Press, 2005) states:

> In the 150 years since Darwin, the field of evolutionary biology has left a glaring gap in understanding how animals developed their astounding variety and complexity. The standard answer has been that small genetic mutations accumulate over time to produce wondrous innovations such as eyes and wings. Drawing on cutting-edge research across the spectrum of modern biology, Marc Kirschner and John Gerhart demonstrate how this stock answer is woefully inadequate.

3. The amazing cell



Bacterium Cell
(Wikipedia)

Our bodies are made up of trillions of cells. At any given time, each cell is doing thousands of jobs, like creating and using energy, and manufacturing thousands of different kinds of proteins which are machines used to build skin, bones, the heart, the eye, etc.

In the nucleus of the cell is the DNA instructions (written in long sequences of letters like ATGC called nucleotides) for making proteins. Proteins build the structures and carry out the chemical reactions necessary for life.

The DNA information is sent to factories called ribosomes that decode the instructions and produce proteins. Proteins themselves are long sequences of characters (called amino acids).

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[15] Michael Behe, "Response to Kenneth R. Miller", July 11, 2007 blog post at http://behe.uncommondescent.com/2007/07/response-to-kenneth-r-miller/ (accessed April 16, 2013).

[16] Behe, The Edge of Evolution, p. 162.

[17] John Barrow, Frank Tipler, The Anthropic Cosmological Principle, (Oxford: Clarendon Press, 1986), pp. 561-65.

Living things look different and act different from non-living things. All living entities are composed of cells. Darwin thought these were simple globs of protoplasm. But the reality is much more complex.

An acorn, for example, consists of billions of cells. At the heart of the cell is DNA. The coded characters of the DNA are also written in sequences of special letters (just like English text). The DNA code spells out all the instructions for building an oak tree from the acorn. What lies at the heart of the cell is digital information. Dawkins writes that the "unjustly called 'primitive' amoebas have as much information in their DNA as 1000 *Encyclopedia Britannicas*.[18] The information in the DNA is spelled out in long strings of characters A-T-G-C (called nucleotides).

DNA contains the instructions for building proteins. Proteins build the structures and carry out the chemical reactions necessary for life. Proteins themselves consist of long sequences of characters made up from an alphabet of about 20 amino acids.

Copying errors and radiation cause mutations in the characters that spell out the DNA. The cell has DNA repair mechanisms, but the repair is not always perfect. The mutations are said to be random, i.e. they occur irrespective of their benefit to the host organism. Almost all the mutations are at best neutral, most being deleterious. The *blind* watchmaker thesis does not allow the mutations to be guided, or to have end goals or purposes in mind.

4. The lack of detailed testable Darwinian pathways

Science is supposed to work with empirical evidence and testing and retesting of hypotheses. In the case of Darwin's grand blind watchmaker thesis, evidence would be examples of detailed Darwinian pathways that justify evolution's grand claim. The problem is that this kind of evidence just does not exist. All that we have are wishful speculations. Let's see why.

Evolutionists do not claim that a grackle's wing pops into existence in one fell swoop. Rather, says Dawkins, evolution always works by cumulative steps, building slowly to the goal through a long series of functional intermediates.[19] The information in the DNA and proteins consist of sequences of characters. By analogy, he says, we can study English text to understand how new information arises in the cell. Meaningful phrases of text correspond to useful adaptations such as wings, eyes and hearts.

Suppose we are looking to generate a target phrase: `METHINKS*IT*IS*LIKE*A*WEASEL`. This is meaningful text taken from Shakespeare's play Hamlet. The phrase is a sequence of 28 characters (including the spaces, which we denote with an asterisk).

At each position of the sequence, there are 27 possibilities (the 26 letters in the alphabet and *). The number of all possible sequences is an impossibly large number: $27\times27\times27\times\ldots$ taken 28 times. Generating the desired target (e.g. by randomly shaking out scrabble pieces) would take almost forever. Most such single-step selections would generate meaningless phrases (let alone the billions of characters needed in proteins and the DNA).

In place of pure chance, Dawkins suggests a cumulative procedure that will substantially reduce the amount of time it would take to produce the target phrase. We can program a computer to execute this procedure (see table below). The program begins by choosing a random sequence of characters: `WDLTM`**`N`**`LT*D`**`T`**`JBKWIRZREZLMQCO*P`. Only three characters (in bold) match the

[18] BWM, p116.

[19] BWM, Chapter 3

target phrase (i.e. they are correct letters in the correct position).[20]

Next, the program generates a set of new random phrases by mutating some of the characters of the initial phrase (this is "random mutation"). The computer examines these mutant phrases and chooses the one which, *however slightly*, most resembles the target phrase ("natural selection"). In the table below, the winning phrase is: WDLTM**N**LT*D**T**JB**S**WIRZREZLMQCO*P. This is not much of an improvement. But we are one letter closer to the target

This procedure is repeated, generation after generation. Amazingly, after just 43 generations, we get the target phrase.

Cumulative selection generates the target in only 43 steps

Generation 01:	WDLTM**N**LT*D**T**JBKWIRZREZLMQCO*P
Generation 02:	WDLTM**N**LT*D**T**JB**S**WIRZREZLMQCO*P
Generation 10:	**M**DLDM**N**L**S*IT**I**S**W**H**R**ZREZ*M**E**C**S***P**
Generation 20:	**ME**LD**IN**L**S*IT*IS**W**PR**KE***Z***WE**C**SEL**
Generation 30:	**METHIN**G**S*IT*IS**W**L**IKE***B***WE**C**SEL**
Generation 40:	**METHINKS*IT*IS*LIKE***I***WEASEL**
Generation 43:	**METHINKS*IT*IS*LIKE*A*WEASEL**

The target is one of $27\times27\times27\times27\times...27\times27\times27\times27\times27\times27\approx10^{40}$ possible strings

The target (generation 43) is a string of 28 characters. At each position in the string, there might be one of 27 possible characters (A-Z or *). A randomly generated string of this length has a probability of one in 27^{28} of being the target (approximately one in 10^{40}). If a program generating 10 million strings per second had been running for 14 billion years (10^{17} seconds), it would have only generated around 10^{24} strings by now. So it would take trillions of years to generate the target in one-step.

Cumulative computer program:

1. Start with a random sequence of 28 characters.
2. Make 100 copies of this sequence, with a 5% chance per character of that character being replaced with a random character.
3. Compare each new randomly generated sequence with the target METHINKS IT IS LIKE A WEASEL, and give each sequence a score. The higher the score the closer the match to the target). E.g. the score could be the number of letters in the sequence that are correct and in the correct position.
4. If any of the new sequences has a perfect score (28), halt.
5. Otherwise, select the highest scoring sequence, and go to step 2.[21]

No free lunch

Dawkins and fellow Darwinists use this example to illustrate the power of cumulative selection to

[20] BWM, p47-49.

[21] See http://en.wikipedia.org/wiki/Weasel_program.

generate a detailed Darwinian pathway. This, they say, is how evolution can solve complex problems without plan and purpose. Their example raises more problems than it solves.

(a) The Darwinian mechanism is supposed to produce a continuous sequence of functionally viable intermediates at each step. In the table, we do not even see a meaningful word (let alone a phrase) of two letters until the 20th generation. Meaningful 8-letter words only appear after the 30th generation. The problem is that relatively few sequences of characters are meaningful. As we increase the length of the sequences to make the analogy more realistic, this problem will only get worse. "In known codes and languages systems, functional sequences do indeed represent typical islands of meaning amid a great sea of gibberish.[22] There is no gradual path up Mount Improbable!

(b) There is an even more serious problem, admitted to by Dawkins. The cumulative procedure assumes the end goal right at the beginning, thus defeating the whole purpose of the computer simulation. The computer is provided the final goal, right at the very beginning, before we even run the program. In order to select a viable mutated sequence, the program has to compare it with target sequence (see line 3 of the procedure). But, the whole point of the *blind* watchmaker mechanism is that the final goal or purpose is not used or known at any step. At each step, the procedure is supposed to be "blind", i.e. it can only work with mutations that are beneficial at that step.

The monkey/Shakespeare example is thus misleading in important ways. Evolution has no long term goals. It cannot compare intermediate mutant generations to a distant target. Life is not like that. Evolution, by definition, has no long term goals. There is no long-distance target to serve as a criterion for selection. In real-life, the evolutionary criterion is always short term survival.

Evolutionists have proposed a variety of biologically unrealistic evolutionary algorithms, but in each case, intelligent design theorists have pointed out that the algorithms have illicitly, and subtly, smuggled in specified complexity.[23] Check with a forensic accountant, before accepting the claims.

5. Evolution's information problem

We have mentioned that the information technology in the genes (spelled out in the DNA) is digital, just like in an instruction manual for building a space shuttle. Even more—the cell contains factories for decoding the instructions and building proteins (written in the discrete language of amino acids.

> Indeed, the entire cell can be viewed as a *factory* that contains an elaborate network of interlocking assembly lines, each of which is composed of a set of large protein machines.[24]

The term "machine" is not just a fuzzy analogy to engineered machines—the term is meant literal-

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[22] "In known codes and languages systems, functional sequences do indeed represent typical islands of meaning amid a great sea of gibberish. Geneticist Michael Denton has shown that, in English, meaningful words and sentences are extremely rare among the set of all possible combinations of letters of a certain length, and they become proportionally rarer as the sequence length grows. … Denton used these figures in 1985 to explain why letter substitutions inevitably degrade meaning in English text after only a few changes and why the same thing might be true of genetic text. Given the alphabetic or "typographic" character of genetic information stored in DNA, Murray Eden (MIT) and others at Wistar suspected that the same kind of problems would affect random mutations in the DNA." Meyer, Darwin's Doubts, p178-179. See the book for the biological evidence that functional protein sequences are extremely rare. We quote some evidence from Yockey and Axe in the section on the origin of life.

[23] William A. Dembski, No Free Lunch, ch. 4, Rowman & Littlefield, 2002.

[24] Bruce Alberts, "The Cell as a Collection of Protein Machines: Preparing the Next Generation of Molecular Biologists", *Cell*, Vol. 92:3, 1998. Emphasis added.

ly.[25]

> Why do we call the large protein assemblies that underlie cell function protein *machines*? Precisely because, like the *machines* invented by humans to deal efficiently with the macroscopic world, these protein assemblies contain highly coordinated moving parts. …
>
> Given the ubiquity of protein machines in biology, we should be seriously attempting a comparative analysis of all of the known machines, with the aim of classifying them into types and deriving some general principles for future analyses. Some of the methodologies that have been derived by the engineers who analyze the machines of our common experience are likely to be relevant.[26]

Astounding molecular machines

As scientists have probed into life they have discovered remarkable molecular machinery in living things. The bacterial flagellum, for example, is a biochemically complex micro-miniaturized rotary motor and propeller system that drives bacteria through liquid (like an outboard motor of a boat). The engine is powered by a flow of acid through the bacterial membrane, can rotate up to 100,000 rpm (ten times faster than a NASCAR racing engine), and can reverse direction in a quarter of a rotation. The engine and drive mechanism are composed of over 30 parts, including a rotor, stator, driveshaft, bushings, universal joint, and flexible propeller. The system comes with an automatic feed-back control mechanism and is self-assembling.

In digital computers, and factories that produce space shuttles—intelligent agency is always implicated. How did all that coded information in the cell arise from unguided, unintelligent, processes?

Only a variety of wishful speculations

Although the vast majority of scientists believe in the blind watchmaker thesis, there is a small group of scientists (called intelligent design theorists) who disagree. For example, molecular biologist Michael Behe at Lehigh University writes:

> It is my scientific opinion that the primary problem with Darwin's theory of evolution is the lack of detailed, testable, rigorous explanations for the origin of new, complex, biological features. ...
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> It should be strongly emphasized that under this broad category of difficulties lies much of the structure and development of life, including: the existence of the genetic code; transcription of DNA; translation of mRNA; the structure and function of the ribosome; the structure of the cytoskeleton; nucleosome structure; the development of new protein-protein interactions; the existence of the proteosome; the existence of the endoplasmic reticulum; the existence of motility organelles such as the bacterial flagellum and the eukaryotic cillum; the development of the pathways for the construction of the cilium and flagellum; the existence of the defensive apparatus such as the immune system and blood clotting system; and much else. The existence of such unresolved difficulties for Darwinian theory at the molecular level of life makes it reasonable to wonder if a Darwinian framework is the right way to approach such questions. It also makes it reasonable to wonder if Darwinian processes explain major new features of life at higher levels, such as the level of organs and organisms.[27]

This is why our main question should be: Is there even one detailed Darwinian pathway for or-

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[25] Michael Behe on p301 of the Edge of Evolution writes: "The terms "robot" and "machine" applied to the cell are not meant as analogies - they are meant quite literally. That cells and the systems they contain are robotic machinery is widely recognized in the scientific community. For example, Tanford and Reynolds dub proteins "Nature's Robots" (Tanford, C., and Reynolds, J. A. 2001 Nature's robots: a history of proteins. Oxford: Oxford University Press) and the term "molecular machines" is routinely used to describe protein complexes. For example, see the December 2003 BioEssays Special Issue on Molecular Machines, containing such articles as "The spliceosome: the most complex macromolecular machine in the cell?" and "Perpetuating the double helix: molecular machines at eukaryotic DNA replication origins."

[26] *Ibid.* Emphasss added.

[27] (Expert Witness, Intelligent Design Theorist, Michael Behe, Professor of Biological Sciences, Lehigh Uni-versity, Submission to Kitzmiller vs. Dover, 2005).

gans of perfection such as wings, eyes and brains? One might think that once we have a primitive cell, perhaps we can use undirected processes to generate new genes and molecular machinery such as the flagellum outboard motor. Nothing doing.

> We should reject, as a matter of principle, the substitution of intelligent design for the dialogue of chance and necessity (Behe 1996); but we must concede that there are presently no detailed Darwinian accounts of the evolution of any biochemical system, *only a variety of wishful speculations*.[28]

> In fact, there are no detailed Darwinian accounts for the evolution of any fundamental biochemical or cellular system, *only a variety of wishful speculations*. It is remarkable that Darwinism is accepted as a satisfactory explanation for such a vast subject – evolution – with so little rigorous examination of how well its basic theses work in illuminating specific instances of biological adaptation or diversity.[29]

The organized complexity at the level of life is staggering beyond imagination. So where is the evidence that the blind watchmaker thesis is responsible? One would expect that there should be many detailed Darwinian pathways. So how many do have scientists have? The answer is: *Not even one*. Remarkably, all we have is "a variety of wishful speculations".

6. Insurmountable problems at the origin of life

How did life originate from dead chemicals?

In the 1950s, a graduate student named Stanley Miller was able to synthesize amino acids in the laboratory by passing electric sparks through a methane gas in one of his experimental apparatuses in the laboratory. He obtained some amino acids by electrical charges passed through the methane gas. Now, amino acids are not yet life.

What he did <u>not</u> get are the thousands of proteins (made up of long sequences of amino-acids) that are needed for life. He and subsequent scientists were also not able to find undirected natural processes for generating DNA (to code for proteins) and the rest of the cellular machinery. So this was a pretty big extrapolation that went far beyond the observable evidence.

While many speculative scenarios have been suggested, the problem is that they all have major problems. Forty eminent scientists contributed to *Origins: Genesis, Evolution and the Diversity of Life* (Springer, 2004). Leslie Orgel wrote in the Foreword of the book:

> How did the organic molecules involved in the earliest stages of chemical evolution accumulate on the primitive earth? ... You won't find definitive answers to any of these important questions in this or any other book on the Origin of Life, but you will find them discussed from a variety of different perspectives in a stimulating way. You may even be tempted to do an experiment!

Take the enzyme *cytochrome c*—a relatively small protein important for all life. It is a sequence of about 110 amino acids many of which must be there in a specific order. What is the probability of chance coughing up this single highly specified and functional protein?

Yockey writes that to generate just one such molecule would take orders of magnitude more time than the billions of years that scientists believe the universe has existed.[30] And that is just one

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[28] Franklin M. Harold, The Way of the Cell: Molecules, Organisms, and the Order of Life, Oxford University Press, Oxford ; New York, 2001. Emphasis added.

[29] James Shapiro, Darwin's Black Box: The Biochemical Challenge to Evolution.; book reviews, National Review,16, p62-65, September, 1996.

[30] Hubert Yockey, *Information theory, evolution and the origin life*, Cambridge University Press, 1992, P255: "Shklovskii & Sagan (1966) and Eigen (1971) estimate the primeval soup to have contained ~10^{44} amino acid molecules. … Using the Poisson probability distribution, it is easy to calculate that Lachesis must throw her isosahedral dice selecting one from all ~10^{44} amino acids in the primeval soup once each second for 10^{23} years to have a probability of 0.95 that her nimble fingered sister Clotho will complete one iso-1-cytochorm-c molecule. If this were the complete scenario, the fatal sisters would be just beginning since the universe is only about 1.5 x 1010 years old."

tiny building block. Life needs thousands of such co-ordinated building blocks to get started. The astronomer Fred Hoyle considered the origin of life less probable than the construction of a Boeing 747 from the scraps of metal via a tornado whirling through a junkyard.[31] In *Signature of the Cell*, Meyer surveys all the scenarios and their problems. He writes:

> Axe's improved estimate of how rare functional proteins are in sequence space has now made it possible to calculate the probability that a 150 amino-acid compound assembled by random interactions in a prebiotic soup would be a functional protein. … The odds of getting even one functional protein of modest length (150 amino acids) by chance from a prebiotic soup is no better than 1 chance in 10^{164}. . . . Now consider that there are only 10^{80} protons, neutrons, and electrons in the observable universe. Thus, if the odds of finding a functional protein by chance on the first attempt had been 1 in 10^{80}, we could have said that's like finding a marked particle – proton, neutron, or electron (a much smaller needle) – among all the particles in the universe (a much larger haystack). Unfortunately, the problem is much worse than that. With odds standing at 1 chance in 10^{164} of finding a functional protein . . . the probability is 84 orders of magnitude (or powers of ten) smaller than the probability of finding the marked particle in the whole universe. Another way to say that is the probability of finding a functional protein by chance alone is a trillion, trillion, trillion, trillion, trillion, trillion, trillion times smaller than the odds of finding a single specified particle among all the particles in the universe.[32]

It is remarkable that to produce even one functional protein of modest length (150 amino acids) by chance in the prebiotic soup would use up much more than the probabilistic resources of the entire universe.

So, how did all this meaningful information and amazing machinery arise by undirected natural processes? The truth is that the scientists do not know. The empirical evidence suggests that undirected natural processes are not capable of overcoming the problems. Physicist Paul Davies writes:

> When I set out to write this book I was convinced that science was close to wrapping up the mystery of life's origin. The dramatic evidence for microbes living deep underground promised to provide the 'missing link' between the prebiotic world of biochemical soups and the first primitive cells. And it is true that many scientists working in this field confidently believe that the major problems of biogenesis have largely been solved. Several recent books convey the confident message that life's origin is not really so mysterious after all. However, I think they are wrong. Having spent a year or two researching the field I am now of the opinion that there remains a huge gulf in our understanding. To be sure, we have a good idea of the where and the when of life's origin, but we are a very long way from comprehending the how. *This gulf in understanding is not merely ignorance about certain technical details, it is a major conceptual lacuna.*[33]

The origin of life on earth thus remains inexplicable so far as the modern scientific enterprise is concerned. Francis Crick, who was the co-discoverer of DNA, once said that the origin of life on the earth is "almost a miracle".[34] The astounding problem of relying on undirected mechanisms drove Crick to the position that the origin of life on earth is so improbable that it probably didn't originate here. He was forced to suggest that it was probably seeded from some other planet else-

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31. "... we turn our attention to the wonderful problem of the origin of life. ... To many recent scholars - Wald (1954), Hoyle and Wickramasinghe (1981), and others - improbable features of current organisms imply improbable origins. If the probability that a protein catalyzes a given reaction is 10^{20} and if a minimal contemporary organism such as a pleuromona-like organism has on the order of 1000 or 2000 enzymes, then the probability of their joint occurrence by chance is, say, $10^{-40,000}$. More likely that, as Hoyle says, the whirlwind assemble a 747 from scraps in a junkyard. Yet here we are, in quite clear contravention to Hoyle's unhappy conclusion. We the lucky, or we the expected?" (Kauffman S.A., "The Origins of Order: Self-Organization and Selection in Evolution," Oxford University Press: New York NY, 1993, p.287)

32 Meyer, Signature in the Cell, p. 212.

33. Paul Davies , The Fifth Miracle: The Search for the Origin of Life, Simon and Schuster, 1999, page 17. Italics added.

34 "An honest man, armed with all the knowledge available to us now, could only state that, in some sense, the origin of life appears at the moment to be almost a miracle, so many are the conditions which would have had to have been satisfied to get it going." Francis Crick, *Life Itself: Its Origin and Nature*, (Simon & Schuster, 1981), p. 88.

where in the universe. But, of course, that just pushes the question back a level and leaves one wondering where that extraterrestrial life came from!

This is especially so, given that the probabilistic resources of the entire universe is insufficient to generate a modest protein via undirected natural processes.

7. "Just-so" stories

As we have seen, the blind watchmaker thesis is wishful thinking. It is not the empirical evidence that argues for the origin and development of life via undirected natural processes. Rather, it is a commitment to the unsupported presupposition of methodological naturalism that drives the search for the origin of life (chemical evolution) and its subsequent development (biological evolution).

Surprisingly, the vast majority of scientists still believe in the blind watchmaker thesis. A small group of scientists (the intelligent design theorists) disagree. For example, molecular biologist Michael Behe at Lehigh University writes:

> It is my scientific opinion that the primary problem with Darwin's theory of evolution is the lack of detailed, testable, rigorous explanations for the origin of new, complex, biological features. ...
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> It should be strongly emphasized that under this broad category of difficulties lies much of the structure and development of life, including: the existence of the genetic code; transcription of DNA; translation of mRNA; the structure and function of the ribosome; the structure of the cytoskeleton; nucleosome structure; the development of new protein-protein interactions; the existence of the proteosome; the existence of the endoplasmic reticulum; the existence of motility organelles such as the bacterial flagellum and the eukaryotic cillum; the development of the pathways for the construction of the cilium and flagellum; the existence of the defensive apparatus such as the immune system and blood clotting system; and much else. The existence of such unresolved difficulties for Darwinian theory at the molecular level of life makes it reasonable to wonder if a Darwinian framework is the right way to approach such questions. It also makes it reasonable to wonder if Darwinian processes explain major new features of life at higher levels, such as the level of organs and organisms.[35]

In the scientific journals, the media and the blogs, members of the intelligent design movement are "despised" as creationists. But this does not change the facts. Darwin's blind watchmaker thesis is a "just so" story.

The "Just So stories for Little Children" were highly fantasized stories for differences among animals by the British author Rudyard Kipling. For example, the whale has a tiny throat because he swallowed a mariner, who tied a raft inside to block the whale from swallowing other men. Richard Lewontin, Alexander Agassiz Professor of Zoology at Harvard, and an evolutionist writes:

> Our willingness to accept scientific claims that are *against common sense* is the key to an understanding of the real struggle between science and the supernatural. We take the side of *science* in spite of the *patent absurdity of some of its constructs*, in spite of its failure to fulfill many of its extravagant promises of health and life, in spite of the tolerance of the scientific community for unsubstantiated *just-so stories*, because we have a prior commitment, a commitment to materialism.[36]

Why must the evolutionary naturalist adopt a zero concession policy to the meta-natural – something that transcends nature? Why accept "absurd" constructs and unsubstantiated "just so" stories for the origin of and development of life rather than supra-natural creation by a transcendent Creator? Lewontin expresses his fear of the meta-natural as follows:

> It is not that the methods and institutions of science somehow compel us to accept a material explanation of the phenomenal world, but, on the contrary, that we are forced by our *a priori* adherence to material causes to create

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35. (Expert Witness, Intelligent Design Theorist, Michael Behe, Professor of Biological Sciences, Lehigh Uni-versity, Submission to Kitzmiller vs. Dover, 2005).

36 Richard Lewontin, "Billions and Billions of Demons", New York Review of Books, Vol. 44, 1997. Emphasis added.

> an apparatus of investigation and a set of concepts that produce material explanations, no matter how counter-intuitive, no matter how mystifying to the uninitiated. Moreover, that materialism is absolute, for we cannot allow a Divine Foot in the door. The eminent Kant scholar Lewis Beck used to say that anyone who could believe in G-d could believe in anything. *To appeal to an omnipotent deity is to allow that at any moment the regularities of nature may be ruptured, that miracles may happen.*[37]

The well-known atheistic philosopher Thomas Nagel has just written a book with the provocative title *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False.* You read that right. The book's subtitle states that "the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False."

Nagel is an atheist who is not convinced by the positive case for intelligent design. But he clearly finds the evidence for modern Darwinian theory wanting. He writes:

> In thinking about these questions I have been stimulated by criticisms of the prevailing scientific world picture... by the defenders of intelligent design. Even though writers like Michael Behe and Stephen Meyer are motivated at least in part by their religious beliefs, the empirical arguments they offer against the likelihood that the origin of life and its evolutionary history can be fully explained by physics and chemistry are of great interest in themselves. Another skeptic, David Berlinski, has brought out these problems vividly without reference to the design inference. Even if one is not drawn to the alternative of an explanation by the actions of a designer, the problems that these iconoclasts pose for the orthodox scientific consensus should be taken seriously. They do not deserve the scorn with which they are commonly met. It is manifestly unfair.[38]

As mathematician David Belinksi (an agnostic) writes[39]:

- The suggestion that Darwin's theory of evolution is like theories in the serious sciences —quantum electrodynamics, say—is *grotesque*. Quantum electrodynamics is accurate to thirteen unyielding decimal places. Darwin's theory makes no tight quantitative predictions at all.
- The astonishing and irreducible complexity of various cellular structures has not yet successfully been described, let alone explained.
- A great many species enter the fossil record trailing no obvious ancestors and depart for Valhalla leaving no obvious descendants.
- Tens of thousands of fruit flies have come and gone in laboratory experiments, and every last one of them has remained a fruit fly to the end, all efforts to see the miracle of speciation unavailing.

Nagel points out, "the empirical arguments" offered by intelligent design proponents "are of great interest in themselves." It is the evidence that matters, and it is the evidence that demands a response. He writes: "I believe the defenders of intelligent design deserve our gratitude for challenging a scientific world view that owes some of the passion displayed by its adherents precisely to the

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[37] Ibid. Emphasis added.

[38]. Nagel is a Fellow of the American Academy of Arts and Sciences and recipient of the prestigious Balzan Prize for his work in moral philosophy. He has received fellowships from the National Science Foundation and the National Endowment for the Humanities, among other institutions. He is one of America's top philosophers. Obviously, he also is a man of great courage and independence of thought.

[39]. David Berlinski, "All Those Darwinian Doubts", Wichita Eagle, March 9, 2005. The order of presentation has been changed.

fact that it is thought to liberate us from religion. That world view is ripe for displacement…"

8. Intelligent Design

The *Chovos Halevovos* expresses best what we should conclude from "signs of wisdom" (סימני חכמה) we see in the cosmos:

> There are men who say that the world came has come into existence by chance, without a Creator Who caused it and formed it. I find this rather astonishing!
>
> How could any rational human being, in his right mind, entertain such a notion? …
>
> Surely you would agree that, if a man were accidentally to spill some ink onto a blank sheet of paper, it is impossible that it would take the shape of orderly writing and legible lines, as are written with a pen. If a person were to show us [a page of] orderly writing - that could only have been written with a pen - and say that ink had spilled out onto the page and had, on its own, taken the shape of written characters, we would be quick to deny it to his face, as this could not have come about without a purposeful designer. Now, since this appears to us to be an impossibility in regard to written characters, [which are merely] products of convention, how can one say - in regard to something more subtle in its art, more difficult in its achievement and of boundless depth - that it is without the intent of a Designer, without the wisdom of an omnipotent Intelligence?
>
> All that we have cited, in demonstrating the existence of the Creator from the perspective of His works, is sufficient for anyone who will understand and admit the truth. It is also sufficient to answer those who say that the world is eternal and to refute their contentions. Know this well![40]

[40] Rabbi Bachya ben Joseph ibn Paquda, Duties of the Heart, translated by Daniel Haberman, feldheim, 1996, volume I, pages 91-92. See the first Midrash Rabbah, Lech Lecha where the design argument is attributed to Abraham. See Medrash Temurah: "G-d created" (Gen. 1:1): A heretic came to Rabbi Akiva and asked, "Who made the universe?". Rabbi Akiva answered, "Hakadosh Boruch Hu". The heretic said, "Prove it to me." Rabbi Akiva said, "Come to me tomorrow". When the heretic returned, Rabbi Akiva asked, "What is that you are wearing?" "A garment", the unbeliever replied. "Who made it?" "A weaver." "Prove it to me." "What do you mean? How can I prove it to you? Here is the garment, how can you not know that a weaver made it?" Rabbi Akiva said, "And here is the world; how can you not know that Hakadosh Boruch Hu made it?" After the heretic left, Rabbi Akiva's students asked him, "But what is the proof?" He said, "Even as a house proclaims its builder,a garment its weaver or a door its carpenter, so does the world proclaim the Holy Blessed One Who created it. Sefer Tehillim e.g. Borchi Nafshi. Chovos Halevovos Shaar Habechina. Rabbi Elchanan Wasserman zt"l in Kovetz Maamarim.