

Scientific Reality vs. Intelligent Design According to Dr Hubert P. Yockey.

(Deconstructed by ID Editor).

(Source <http://www.cynthiayockey.com/pages/1/index.htm> Mar 2006)

Nuclear physicist and bioinformatician Dr. Hubert P. Yockey says Intelligent Design theorists like Michael Behe are wrong. He has written *Information Theory, Evolution, and the Origin of Life* (Cambridge University Press, 2005) and *Information Theory and Molecular Biology* (Cambridge University Press, 1992). Yockey claims he is the only scientist who has defined the distinction between living and non-living matter — he says his definition is fundamental to the scientific understanding of the origin of life.

(ID Editorial Comment; This is an error of fact. Many scientists have attempted to define the distinction between living and non-living matter" Apparently Yockey feels his attempt is superior to all others.)

The points below that Yockey thinks most contradict the assertions of Intelligent Design are Points B3, B4 and B5, which address the origin of life, gaps in the fossil record and "irreducible complexity."

ID Assertion B1.

The Darwinian theory of evolution, like all scientific theories, is not a fact. (quoting Miller)
"Scientific theories are explanations of facts. That is why they are not facts."

Yockey's answer;

Miller's true assertion is often taken out of context and may mislead readers into concluding that Miller said all scientific theories are false, or at least perpetually shaky, because they are not facts. That is not true.

(ID Editorial Comment; It is not the intention of ID proponents to mislead anyone.)

ID Assertion B2.

"The origin of life is still an unsolved scientific problem." (quoting Miller)

Yockey's answer;

The origin of life is unsolvable as a scientific problem. Proven by Dr. Hubert P. Yockey (*Information Theory and Molecular Biology*, Cambridge University Press, 1992; *Information Theory, Evolution and the Origin of Life*, Cambridge University Press, 2005). Predicted by Nobel laureate Niels Bohr in 1933.

(ID Editorial Comment; Dr Yockey claims to have proved that life is an axiom. This is exactly what ID proponents claim will be the result of all scientific attempts to explain the origin of life apart from intelligent agency.)

Assertion B3.

"Intelligent design is an explanation of the origin of life that differs from Darwin's view."

(ID Editorial Comment; Is this not a true statement?)

Yockey's answer;

If so, that is why Intelligent Design has no place in a science classroom ever, for the following

reasons:

(ID Editorial Comment; Yockey is saying that discussion or speculation on the origin of life will never have a place in science. I think he is out on a limb here.)

1. What should be taught in science classes is why the origin of life is one of science's unsolvable problems. Information theory and coding theory show why life could not originate proteins first, RNA first, in a pond or ocean, on a rock or on other planets.

(ID Editorial Comment; I think we in ID agree)

Life originated, but must be taken as an axiom [something we know to be true, but cannot prove].

The problem in the origin of life that science is unable to solve is to explain how information began to govern chemical reactions through the means of a code.

(ID Editorial Comment; I think we in ID agree)

One of the reasons that science has not correctly addressed how to solve the problem of the origin of life—and accepted more widely that it is unsolvable — is that it has lacked a definition of the distinction between living and non-living matter.

Dr. Yockey is the first scientist to define the distinction between living and non-living matter, which he does as follows: “The existence of the genome and the genetic code divides living organisms from non-living matter. There is nothing in the non-living physico-chemical world that remotely resembles the reactions that are determined by a sequence (i.e., the genome) and codes between sequences (i.e., the genetic code) that occur in living matter.”

(ID Editorial Comment; I think we in ID agree)

Even many scientists do not understand the distinctions between DNA, which is material, and the genome and the genetic code, which are non-material.

(ID Editorial Comment; I think we in ID agree)

2. Darwin never proposed a theory for the origin of life in his scientific publications. What he wrote about the origin of life in Chapter XV of the sixth edition of *The Origin of Species* (1872) is as follows: “It is no valid objection that science as yet throws no light on the far higher problem of the essence or origin of life.”

(ID Editorial Comment; Apparently Darwin did not view the origin of life as an axiom, but as a big problem. Considering his very simplified view of what "simple life" consisted of, this is a huge admission.)

Darwin's speculation of life beginning in a “warm little pond” was written in his private correspondence. Private correspondence is intended to be private. If Darwin had truly believed this, he had ample opportunity to include it in his scientific publications. He did not. Also, similar speculations can be dated to the 1840s in both scientific and popular English literature.

(ID Editorial Comment; How can we know that Darwin did not believe what he wrote in letters, only what he published in scientific papers? There may have been many reasons why Darwin kept his belief form publication.)

Darwin's real opinion of the origin of life was that life appeared by a “wholly unknown process,” as he wrote in a private letter in 1898:

“But I have long regretted that I truckled to public opinion, and used the Pentateuchal term of ‘creation,’ by which I really meant ‘appeared’ by some wholly unknown process. It is mere rubbish,

thinking at present of the origin of life; one might as well think of the origin of matter.”

(ID Editorial Comment; This contradicts the earlier assertion that "Private correspondence is intended to be private. If Darwin had truly believed this, he had ample opportunity to include it in his scientific publications" - Yockey. How does Yockey know Darwin's "real opinion"?)

Assertion B4.

Gaps in the fossil record constitute valid objections to Darwin’s theory of evolution because they are spaces for the miraculous appearance of species that have not evolved from any other source.

Yockey's answer;

The fundamental consideration in evolution is the genome, not the fossil record. Gaps in the fossil record do not matter. What matters is that there are no gaps in the continuity of the genome from the origin of life to the present. It is the continuity of the genome that shows the connectedness of all life—living, extinct and yet-to-be-evolved. That means there are no gaps in which species miraculously appear, as Intelligent Design falsely claims.

(ID Editorial Comment; This is intended to side step the fossil issue. It is very often asserted by Darwinians that there is no problem with the fossil record. Is Yockey agreeing that the fossil record would really be a problem without what he sees as the evidence from the genome?)

Assertion B5.

Behe claims biology is “irreducibly complex.”

Yockey's answer;

(ID Editorial Comment; The following is a quibble by Yockey about the definitions of phrases and words. Behe clearly defined what he means by "Irreducible Complexity" and it is obviously different from what Turing means by it. This does not at all address the issue Behe raises. Instead it is an irrelevant smoke screen. It is not at all uncommon for the meaning of terms to differ between disciplines. Dictionaries often have multiple differing definitions for words or phrases.)

The correct definition of “irreducible complexity” in information science is a computation whose result can be computed for eternity and never reach its final answer. Behe cannot appropriate this term and substitute his own intuitive understanding of the words.

(ID Editorial Comment; Behe is allowed to define phrases as he wishes them to be interpreted within his own work.)

Biology is not irreducibly complex because the bit string in the genome that describes a protein is finite and stops after it produces the protein (so the computation does not run indefinitely).

A summary of another proof of why biology is not “irreducibly complex” is as follows:

Dr. Yockey’s work shows, the genome is digital, linear and segregated. “Digits” in this case means the letters of an alphabet, each one different from the other. The letters of the alphabet of the genome are the 64 triplet codons of DNA and RNA. The “triplet letters” are in a sequence in DNA and RNA, so they are linear. And they are separate and distinct from one another, so they are segregated.

Claude Shannon showed that information can be measured in any sequence that is digital, linear and segregated. Therefore the information in the genome can be measured. Therefore the genome — the critical element for evolution in biology — is not “irreducibly complex.” Therefore, there is no requirement in evolution for an Intelligent Designer.

(ID Editorial Comment; Yockey either has not read, or does not understand what Behe means by Irreducible Complexity if he considers the above a refutation of the concept.)

Yockey Definitions:

(ID Editorial Comment; Now we are expected to allow Yockey to define his own terms, when he doesn't allow Behe the same freedom. Interesting.)

Genome: The genome is the message written in DNA. The genome is information, which is non-material, but measurable, while DNA is a material substance. Thus, "genome" and "DNA" are not synonyms, nor are they synonymous with the term "genetic code." The units in which information is measured are bits and bytes, which are familiar terms to computer users.

Genetic code: The genetic code is the non-material map of which letter, from the 64-letter alphabet in DNA specifies (i.e., puts in place in a sequence) which letter, from the 64-letter alphabet in RNA, and then which letter from RNA, specifies one of 20 amino acids in the formation of a protein. Amino acids are the 20-letter alphabet of proteins. DNA, RNA and protein are sequences.

Complexity and orderliness: In information theory, "complexity" refers to the amount of information required to describe a sequence. "Orderliness" and "complexity" have opposite meanings. The more a sequence is orderly, the less it can be complex because it can be described with a short sequence. The more a sequence is complex, the less it is orderly because it requires a longer sequence to describe.

Yockey's answers to Dr Scott Minnich

Minnich quotes are from "Federal Rule of Civil Procedure 26, Disclosure of Expert Testimony, Scott Minnich, Ph.D." in Tammy Kitzmiller, et al. v. Dover Area School District and Dover Area School District Board of Directors, case number 04-CV-2688, available in full at <http://www2.ncseweb.org/kvd/experts/minnich.pdf>.

Assertions by Scott Minnich in favor of Intelligent Design

Assertion M1

"Proponents of evolution recognize, as they must, the significant gaps and problems with the theory of evolution. For example, experts in the field acknowledge that we have no phylogenetic history (i.e., inability to historically trace the roots) of a single biochemical pathway or subcellular organelle. ...

proponents of Darwin's theory of evolution assume that evolution is true, even though we lack the intermediate structures, we lack fossils, and we do not have adequate knowledge of how natural selection can introduce novel genetic information." (pages 2 and 3)

Yockey's answer;

In the nineteenth century and for most of the twentieth, evolution from a common ancestor was demonstrated through morphology and the fossil record.

(ID Editorial Comment; Yockey says that fossils are irrelevant, now he asserts that they showed that Darwinian Evolution was true.)

However, what distinguishes living from non-living matter is the genome and the presence of a code. In the twenty-first century, now that we have the ability to sequence genomes, the search for a common ancestor is done by comparing genomes. For example, when we search for a common ancestor of the mouse and the rat, when we compare their genomes, it's the similarity of their genomes that shows us they have a common ancestor.

The greater the similarity of genomes, the more closely related the species are.

(ID Editorial Comment; Note that we are searching for what we already believe to be there. We believe, therefore we confirm our prior belief by what find. ID does not address whether species have a common ancestor. ID addresses whether the differences between species and groups are explicable by random mutations and natural selection.)

We know the rate at which changes appear in the genetic message, so by measuring the similarity between the genomes of the mouse and the rat we can compute how long ago they diverged from their common ancestor.

(ID Editorial Comment; We do not "know the rate at which genetic changes appear". In fact, we use the fossil history compared with the genetic differences, to calculate the rate. We then use this rate to "compute how long ago they diverged from their common ancestor" This is obviously circular logic.)

Therefore there is no need for records of intermediate structures or a fossil record—because there are no gaps in the genome.

(ID Editorial Comment; There may not be a need, but why are they not there? Or are they there?)

Minnich has it backwards when he asserts “we do not have adequate knowledge of how natural selection can introduce novel genetic information.” “Novel genetic information” comes first through the reshuffling of genetic information in reproduction, then natural selection operates.

(ID Editorial Comment; Novel means new. No new information is ever added to a genome through duplication. If we photocopy a page 100 times, we have no new information.)

In my book, *Information Theory, Evolution and the Origin of Life* (Cambridge University Press, 2005). In Chapter 12, my answer to the question, “Does evolution need an intelligent designer?” concludes as follows:

“The origin of life, like the origin of the universe, is unknowable. But once life has appeared, Shannon’s Channel Capacity Theorem assures us that genetic messages will not fade away and can indeed survive for 3.85 billion years without assistance from an Intelligent Designer.

(ID Editorial Comment; The origin of life is "unknowable". How can we know anything is unknowable?)

There is an enormous redundance in protein families. Although majority logic redundance plays an unimportant role in telecommunications, it is controlling in the genetic communication system. This shows without a doubt that evolution and genetics cannot be understood except by information theory.

(ID Editorial Comment; I think we agree with the above statement.)

“Evolution of the genetic code and of the genome proceeds by a Markov chain or random walk. There are a number of events in this Markov chain, including gene duplication and horizontal gene transfer through biosynthetic pathways.

(ID Editorial Comment; Note Yockey talks here of "evolution of the genetic code" but below he states "it is the genome that evolves, not the genetic code." Yockey seems to demonstrate the same misunderstanding of terminology that he accuses Minnich of having.)

The duplicated genes provide redundance protection against mutation to a nonspecific message, but also to the evolution of a new gene (Graure and Li, 2000; Haldane 1932). The slight modifications, as Darwin believed, are supplemented by gene duplication and horizontal gene transfer.

(ID Editorial Comment; As above, duplication provides no new information. Horizontal gene transfer imports pre existing specified information from other organisms, This is not a source of novel information either.)

Current results in genetic sequencing show that duplicated genes are abundant in most genomes (Lynch 2002; Lynch and Conery, 2000).

“The messages in the DNA sequences are similar to programs used by modern computers. mRNA acts like the reading head on a Turing machine, which moves along the DNA sequence to read off the genetic message to the proteome.

The fact that the sequence has been read shows that it is not ‘irreducibly complex’ or random. By the same token, Behe’s mouse trap is not ‘irreducibly complex’ or random.

(ID Editorial Comment; As above, Behe does not use the phrase "Irreducibly complex" in the same way Turing does. The fact that "Irreducibly Complex" systems are coded on the genome and may be read is obvious and does nothing to explain their origin.)

“The same genetic code, the same DNA, the same amino acids and the genetic message that unites all organisms, independent of morphology, proves that the theory of evolution is as well-established as any in science.

(ID Editorial Comment; ID proponents are educated and obviously agree that the genetic message unites all organisms. That this proves the theory of Darwinian Evolution is a blind assertion.)

There is indeed Aristotle’s ‘Great Chain of Being’ (Lovejoy 1936) that relates all living things. How this happened must be learned by measuring, counting and weighing, as Socrates taught us. “The fact that there are many things unavailable to human knowledge and reasoning, even in mathematics, does not mean that there must be an Intelligent Designer.”

(ID Editorial Comment; Remember also that the fact that there are many things available to human knowledge and reasoning, and mathematics, does not mean that there must not be an Intelligent Designer.)

Assertion M2

“The efficiency of these engines (cellular structures such as the flagellum) is truly remarkable. And we do not have a phylogenetic history of a single such machine.”

Yockey’s answer;

Yes, we do: it’s the genome. Objections based on morphology are more than 50 years behind the times.

(ID Editorial Comment; I didn't quite get why the current genomes explain the phylogenetic history. Please clarify.)

Assertion M3.

“Irreducible complexity, a term coined by Michael Behe in his scientific argument for intelligent design, essentially states that molecular machines are comprised of a core set of components essential for the function of that machine....

“Most importantly, this concept of irreducible complexity poses a problem for the gradual appearance of such machines. If it is the summation of all the parts that provide function, and the loss of a single component renders the machine useless (much like the ‘invented’ machines we make) then natural selection has nothing upon which to select.”

Yockey's answer;

First, Behe did NOT coin the term “irreducible complexity,” he hijacked it from Alan Turing and stole its identity.

(ID Editorial Comment; The use of the terms "hijacked and stole prove Yockey lacks objectivity and is basing his reactions to ID on feeling not fact.)

Turing defined “irreducible complexity” as a computation that runs indefinitely. Cellular processes start and stop, therefore they do not run indefinitely, therefore they are not irreducibly complex.

(ID Editorial Comment; Behe defined what he meant by IC and if we read his writings, we will be in no doubt. He does not mean the same as Turing. What does Gay mean and was it "hijacked" and Stolen too?)

Assertion M4.

“Evolution cannot explain genotype vs. phenotype, the origin of information or even how life initiated.”

Yockey's answer.

Darwin made it clear that he knew that the origin of life was a different problem than evolution. He made it clear that his theory of evolution did not address the origin of life. Darwin's theory of evolution does not explain genotype vs. phenotype because that is outside its scope — it would be just as logical to complain that Darwin's theory of evolution doesn't explain general relativity.

(ID Editorial Comment; There is no substance, only evasion in that comment.)

Assertion M5:

“The very genetic code, what Francis Crick, the co-discoverer of the shape of DNA, referred to as a ‘frozen accident,’ does not appear to have evolved. Yet, it is a true code representing the most efficient information storage system known in the universe. Analysis of this code with the tools of supercomputers now shows us that of all possible codes, assuming ours is arbitrary, the natural code is hands down the best set of amino acid codons optimized to minimize the effects of point mutations. [Minnich's reference for this remark is as follows: Hayes, B. 2004. Ode to the Code. American Scientist. 92(6) Page: 494.]

Yockey's answer.

Minnich confuses the genome with the genetic code. The genome is the non-material information programmed into DNA. A code is a mapping of one alphabet to another. The genetic code is the mapping of the 64-letter alphabet programmed in DNA to the 64-letter alphabet of RNA to the 20-letter alphabet of protein (i.e., amino acids).

Minnich asserts that the genetic code has not evolved. It is impossible to tell what he means by this since he obviously confuses the terms “genome” and “genetic code.” It is the genome that evolves, not the genetic code. If the genetic code were to evolve, that would scramble all the genetic messages programmed in the genome because of the changes in mapping between the alphabets of DNA, RNA and protein.

(ID Editorial Comment; Minnich, unlike Yockey is a biologist. He understands perfectly well the distinctions outlined. To assert Minnich is "obviously confused" is absurd. It seems that it is Yockey that is unformed about what ID proponents claim, and what they mean by the terms they use.)

However, Thomas Jukes considered a doublet code as a possible ancestor to the triplet code, but a doublet code can only produce 16 codons and 16 amino acids; since life requires at least 20 amino acids, Jukes dropped this speculation.

[Note: Classically, there are 20 amino acids, but recent research adds two more for a total of 22.]

Assertion M6:

"I have read and am familiar with the text of *Of Pandas and People*. This is a good text that critically analyzes various aspects of Darwin's theory. It asks critical questions in terms of the evidence and mechanism required to drive evolution. Such questions are essential for the advancement of science. Making students aware of the controversy in the science community is good for students and it is good for science. Repressing evidence and ideas has the opposite result."

Yockey's answer;

The objections to evolution in *Of Pandas and People* are invalid for the following reasons:

1. The evidence for evolution is in the genome. There are no gaps in the genome from the origin of life to the present and for all life yet-to-be-evolved. Therefore gaps in morphology or the fossil record are not valid objections.

(ID Editorial Comment; Repetition of blind, unsubstantiated assertion is not convincing.)

Texts objecting to Darwin's theory of evolution based on morphology and/or gaps in the fossil record are obsolete by several decades.

(ID Editorial Comment; This begs the question of whether they were ever valid.)

2. Texts that object to Darwin's theory of evolution because it does not explain the origin of life are engaging in deliberate deception. Darwin stated clearly that his theory of evolution took the origin of life as an axiom and did not attempt to explain it. Texts engaging in deception have no place in the classroom.

(ID Editorial Comment; Deception is to deliberately state something that is not true. Did Darwin speculate on the origin of life or not? The answer is yes. Is it part of his theory? That depends on who we listen to.)

3. Life is not irreducibly complex — in the original and correct use of the term — because the program containing the information of the genome starts a task and then stops when it has completed its task. In the case of a mouse, the production of the mouse has a definite beginning and end.

Comparisons to non-living examples, such as mousetraps, purporting to show "irreducible complexity" and "intelligent design" are invalid because a mousetrap has no genome and does not produce little mousetraps.

While a mousetrap must have a designer to take the place of the genome in order to evolve to better designs, the genome evolves through a random walk and has no need of an Intelligent Designer.

(ID Editorial Comment; The repetition of the assertion that "the genome evolves through a random walk and has no need of an Intelligent Designer" as if that has been established by experimental evidence is verging on "engaging in deliberate deception."

In summary, Darwin's theory of evolution is as well-established as any theory in science for the following reasons:

1. The engine of evolution is the genome, which is the non-material information programmed in DNA.

(ID Editorial Comment; The genome is the object of evolution, not the engine of evolution. ID proponents agree that there is "non-material information programmed in DNA" but disagree that it

is programmed by a "random walk with drift". Does anyone use a random walk with drift to get to work in the morning or write an essay? Random in, random out.)

2. Introducing a requirement for an Intelligent Designer is ad hoc and invalid. Explanations of the requirement for an Intelligent Designer almost invariably are "inferred" from non-living matter, usually a machine of some kind.

Machines require an "Intelligent Designer" to exist—or evolve—because they do not have a genome.

(ID Editorial Comment; The reproduction of genomes require machines, which are themselves encoded into the genome. The logic of ID is inescapable. In Yockey's own words even genome reproducing "Machines require an "Intelligent Designer" to exist—or evolve")

Living things do not require an ad hoc "Intelligent Designer" to live and evolve because they DO have a genome.

(ID Editorial Comment; The Intelligent Design is detected in the information. The Intelligent Designer is not ad hoc or invalid. "Machines require an "Intelligent Designer" to exist—or evolve")

The crux of Intelligent Design "theory" is therefore to maintain that the Intelligent Designer substitutes for the genome in evolution.

(ID Editorial Comment; The existence of any genome requires that it be able to be copied. Copying a genome requires machinery. Machinery is the product of Intelligent Design. Thus it is logically necessary that the existence of the genome requires an Intelligent Designer.)

The genome evolves through a random walk and has no need of an Intelligent Designer.

3. There's no such thing as "irreducible complexity" in biology because the information programmed in the genome starts tasks and stops when they are completed — the computing process of reading the stored information does not go on indefinitely.

I explain all of these points in detail in my book, Information Theory, Evolution and the Origin of Life.

(ID Editorial Comment; ID proponents explain why all the above arguments are inadequate in their books. See www.arn.org or www.designinference.com)

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