

## Conference Talk

# Integration and Confrontation of Contemporary Worldviews: Evolution and Intelligent Design

Pattle Pun



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*Evolution and Intelligent Design (ID) are two opposing worldviews from which many contemporary intellectuals discuss the issues of origins of life. By evaluating the various Christian views of origins and the weaknesses of the evolution paradigm, an attempt is made to present ID as an alternate paradigm. Possible research programs based on the ID paradigm are proposed.*

*I would like to suggest ... that the issue of ID is not only an issue of science, but also of worldviews.*

**T**hank you for the opportunity to address such an impressive group of scholars, Christians, and seekers, and to be in the company of such renowned scholars as Dr. Schaefer, Dr. Plantinga and Dr. Hutchinson. Although I am very knowledgeable in science, I cannot claim to be a world renowned scientist. I am doing my science as much as possible to keep up. But at the same time, I am relating my science to my Christian faith daily as a professor of biology at Wheaton College. Wheaton exists for the sole reason of integrating faith and learning, as do other Christian colleges. I would like to discuss with you some of the issues I am trying to tackle and also to introduce the currently hotly debated issue of Intelligent Design (ID). This issue has been portrayed in the media critically and negatively. I would like to put the discussion in a slightly positive spin according to my calling as a scientist and my knowledge in theology. I would like to suggest to us that the issue of ID is not only an issue of science, but also of worldviews.

Most of the people who are propagating the evolutionary paradigm have a worldview more amenable to atheism or naturalism. The alternative worldview which Christians espouse stipulates a Creator who created the world and is involved in it. So I would like to suggest that it is a confrontational issue as well as an integration issue for those of us who are Christians.

I will divide my talk into four categories. Firstly, I will discuss the biblical foundation of integration: what is the biblical injunction to be a Christian? Secondly, I will evaluate the various Christian positions on creation and evolution. Thirdly, I will address the philosophical aspect of the issue, namely, methodological naturalism and inference to the best explanation. Fourthly, I will discuss the enigmas of Neo-Darwinian evolution from my perspective as a biologist. Finally, I will suggest what we can do with ID if we accept it as an alternate paradigm.

## The Biblical Basis of Integration

In Genesis, we are told that we are created in God's image. One of the meanings of the image of God is that humans are representatives of God to the rest of creation. We are called to multiply, fill, and subdue the earth and to be a steward of God's creation.<sup>1</sup> We are much better at carrying out some aspects of this creation mandate, particularly in China, my ethnic background, and in America also, which just reached the landmark

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of 300 million people recently. Unfortunately, as stewards we have not taken care of the earth well with problems of pollution and global warming. In the New Testament, we are also admonished to invest the talents given to us, with rewards for the investors and reprimands for those who do not invest.

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*We are called to be a steward of God's creation, to be in the world but not of the world, to live a life worthy of our calling, and to recognize that all truth is God's truth ... We have to start with these premises in terms of our biblical bases of integration.*

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Second, Jesus prayed for his disciples in the upper room because they are *in the world but not of the world*.<sup>2</sup> There goes the saying that liberals are *in the world and of the world*, conservatives are *not in the world and not of the world*. Evangelicals and Christians, then, should be *in the world but not of the world*. Jesus Christ is *in the world*, as the Word becoming flesh. He is *not of the world*, being sinless and having been conceived by the Holy Spirit and born through a virgin. This is not only true for Jesus Christ but also for Christians. As Christians we are light and salt of the world, to be *in the world but not of the world*. This is the essence of incarnational theology.

*We have to live a life worthy of our calling* as Paul has admonished us in several of his epistles.<sup>3</sup> We are put on a pedestal for the world to see. Unfortunately, some famous evangelicals have sinned and have not lived up to their calling. However, we are supposed to do so as admonished by Paul and Jesus Christ.

Finally, *all truth is God's truth*. Our God is the God of reality. Our God is the God of the philosophers. Our God is the God of the scientists. Our God is the God of the atheists, even though they do not acknowledge him. Our God is the God of creation. All truth if originated from God has to be true. Our God is the God of the miracles of Christ's incarnational birth and resurrection. He is also the God of quantum theories and the big bang. It seems to me that we have to start with these premises in terms of our biblical bases of integration.

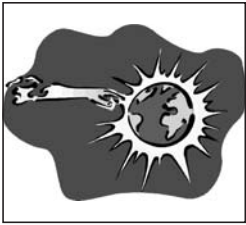
As Christians, we believe in revelation. Revelation is the basic assumption of a theistic, especially a Christian, worldview. We believe in a transcendent God, a Creator that is outside of creation, not part of nature. Yet he is constantly revealing himself to us through the wonders of his creation. In addition, he also sustains it with the Word of his power.<sup>4</sup> Unfortunately, we have sinned. This biblical injunction of the human condition has been seldom recognized by the scientific world. However, it is the reality for those of us who believe in it. Science cannot lead us to God because the creation has been tainted by human sin. Creation has been brought under the condemnation of human sin. Creation has been groaning for the deliverance with the sons of God. Therefore we have to know God through his special revelation, through Jesus Christ, who has become one with us in his flesh, full of truth and grace. Science can only lead us to know that God is our Creator. Only through Jesus Christ, the Incarnate God, can we know God as our Redeemer. This is the revelational truth that Christians believe. To the rest of the pluralistic world, we may appear as bigots. But fortunately or unfortunately, Jesus Christ is the only one who claims to be the only Way, the only Truth, and the only Life. As Christians, we believe in it and defend it.

## Evangelical Views on Creation and/or Evolution

Various Christian views of evolution differ according to the believer's views of revelation and biblical interpretation. The idea of creation as science has been linked to court decisions which struck down state laws that require the teaching of creation or design alongside evolution in public schools because creation is religion and evolution is science. Personally, I do not agree with the legal approach to the debate. Of course, there are various Christian views on the interpretation of biblical creation. Table I is a summary of these views.<sup>5</sup>

Consider first the pre-Adamite theories that include the gap theory in which a gap exists between Gen. 1:1 and 1:2. In Gen. 1:1, God created all of the fossils, which included the early hominids. In Gen. 1:2, God created the recent humans. The pre-Adamite theories also include the two Adams theory. It attempts to avoid all of the conflicts between science and Genesis. However, there is no exegetical justification for inserting a gap between Gen. 1:1 and 1:2.

Most of us are very familiar with the fiat creationist view, which stipulates that God created the world in six 24-hour days, Adam was created 6,000 years ago, the earth is young, and the big bang is a farce and an evolutionist tool that extended the age of the earth to accommodate evolution. In my studies, I find this to be only a minority view amongst evangelical scientists. It accepts a literal interpretation of Genesis to arrive at the young-earth posi-



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tion. However, there are other exegetical principles that allow us to interpret the Genesis days to be more than 24-hour days. For example, Adam waited for a long time to see Eve, so that he proclaimed, "at last this is bone of my bones, flesh of my flesh," (Gen. 2:23, RSV). The Hebrew word here signified a long wait as indicated in other passages in the Old Testament.<sup>6</sup> It would not have been used here if Adam had waited for only a few minutes in the sixth day when God created a mate for him. Young-earth creationists also accept the apparent age of the earth, that God created the earth around 6,000 years ago although it looks old. This puts God in a very awkward position of lying to the scientist in creation.

A theistic evolutionist position is accepted by most academically active evangelical scientists. They believe in God's using the natural law of natural selection to create humans. It has the strength of stressing God's omnipresence and providence by his actively guiding the evolutionary process to create humans. However, it has the weakness of straining the interpretation of Genesis 2 and 3 in terms of Adam and Eve not being historical figures. They may be symbols representing the human race because populations evolve, not individuals. This view puts a lot of strain on the theology of soteriology, especially as addressed by Romans 5 in

which Jesus Christ is juxtaposed as the second Adam. If the first Adam is not real, then Jesus Christ may not be real and his redemption work for Adam's sin is called into question.

The creation myth theory of neo-orthodoxy stipulates that the creation is a myth. It is not real as we are real. Yet it is a theological myth that is more real than reality, although I do not know what that means. The creation myth idea emphasizes the existential encounter between God and humans in salvation. The historical reality of Jesus Christ is not necessary. Jesus Christ can be found in our encounter of him in our experience. Thus it emphasizes our religious experience divorcing it from natural revelation. Is there not a lack of integration between God's action in history and God's salvation through encounter in this position?

A more recent theory based on hope theology champions the hope of Christ's resurrection. God indwells creation. Humans are both the representative of God to creation and the representative of creation to God. Humans are involved with God in creation as a co-creator. It emphasizes humans as co-regents with God in his creation. The problem with this position is the sacrifice of God's transcendence and sovereignty in creation.

	Premises	Strengths	Weaknesses
<b>The Pre-Adamite Theories</b>	The Gap Theory The Two Adams Theory	Avoid conflict with science (old earth and fossils)	Weak exegetical basis; Unity of human race
<b>Fiat Creationism</b>	Young earth or apparent age, no macroevolution	Accepts a certain literal interpretation of Genesis	Conflicts with well established science (old earth, limited flood); Gaps in biblical chronology; God misled men?
<b>Theistic Evolutionism</b>	God created matter and natural law. Accepts macroevolution and synthetic evolution	God's immanence and omnipresence in providential involvement through evolution	Historicity of the first human parents and the Fall, Figurative interpretation of the First Adam in juxtaposition of Christ, the Second Adam; Evolution is deficient
<b>The "Creation Myth" of Neo-orthodoxy</b>	Myth of creation and existential realities of evil and sin	Existential emphasis of sin and salvation	Lack of integration between God's action in history and God's salvation through encounter
<b>"God in Creation" of the Theology of Hope</b>	Resurrection centered God indwells creation	Human as image of God and image of the world; Human participation in God's creation	God's transcendence and sovereignty
<b>Progressive Creationism</b>	Complementarity between science and Scripture; Accept microevolution; Day Age or Framework	Least conflicts with science; maintain historicity of the first human parents and the Fall	Chronology of creation, i.e. light before stars; Civilization of the early humans

Table I. Christian Views on the Interpretation of Biblical Creation.

The final position is my own, namely, progressive creationism, which I suggest is complementary to science and theology. It accepts microevolution, i.e. gene frequency changes, mutations selected by the environment, and so forth. The interpretation of the Genesis day is day-age or framework, which is borne out by famous theologians such as Henri Blocher, Augustine, and Aquinas. It has the least conflicts with science and maintains the historicity of the first human couple. However, the chronology of creation and civilizations of early humans are still issues to be resolved.

## Methodological Naturalism and Inference to the Best Explanation

The next issue that I would like to address is philosophical. I will just introduce these concepts. Methodological Naturalism (MN), according to Plantinga,<sup>7</sup> is a pragmatic way to be most inclusive of all worldviews in order to cooperate in the pursuit of scientific knowledge. It is the practical idea that excludes the supernaturals. Historically, it is not true that MN is the only way to do science. Newton, Faraday, Maxwell, and Copernicus referred to the Creator in their scientific writings. Copernicus actually saw the sun as an enthroned king ruling over his court of planets in formulating his heliocentric theory. It was only after the Enlightenment that the supernaturals were excluded from science.

Science has been taken as an investigation of nature and there is nothing outside of nature. This was based on a naturalistic worldview. Also, the idea of historical vs. empirical sciences may be important. In historical sciences such as cosmology and organic evolution or the origins of the universe and the origins of life, the worldviews of the scientists play a significant role in the investigation. There will be a clash in the answers given by atheists or theists to these questions. However, in empirical sciences such as DNA analysis and the human genome project, the technology has been so established that scientists with various worldviews could perform the same analysis, i.e. microarray, and come up with similar results independent of their presuppositions. Therefore MN is more relevant and applicable in the empirical sciences. But when we come to historical sciences, the worldviews of the scientists will greatly influence the outcome of the research.

The advocates of ID would like to promote another philosophical idea, the inference to the best explanation (IBE). IBE refers to examining the evidence without any preconceived ideas and let the evidence tell you where it leads. If one believes in a creator, the fine tuning cosmology leads one to the handiworks of the Creator. If one believes in no creator, the same evidence will lead one to the concept of multiple universes in which the big bang only happens in the universe in which we live. It seems to me IBE by itself may be a good scientific tool if one is not

restricted to the naturalistic view. In practical science such as the human genome project, if one is able to use the design paradigm which has been heretofore deemed to be only religious, one may come out with different results. May I suggest that it can be a useful paradigm. I will share with you some of the research I am doing using the design paradigm.

In philosophical sciences such as cosmology, geology, anthropology, and psychology in which origins and morality and human participation may be important, the worldviews of the scientists will play prominent roles in the studies. I would like to suggest that the evolution paradigm dominated biology for over 150 years while any design arguments have been deemed to be religious and thus not scientific. However, in my humble opinion, the Neo-Darwinian paradigm is approaching an end of the tunnel and we do not know whether there is light on the other side. If we are stuck there, we may not be able to make much progress. The ID people would like to bring out the enigmas that plague evolutionists, which are there all the time. They were just ignored. The ID people would like to highlight these issues and try to suggest alternative paradigms for their investigation.

## "Enigmas" for Neo-Darwinian Evolution

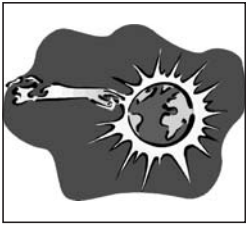
### The Mystery of the Origin of Life

In the famous experiment performed by Miller,<sup>8</sup> he synthesized amino acids by passing an electric discharge, for seven days, through a closed system containing methane, ammonia water, and hydrogen. Porphyrins, important structural components of the photosynthetic and respiratory apparatus of living cells, were also obtained in a similar manner. Adenine, an important base in nucleic acids, was formed by chemical polymerization of hydrogen cyanide and ammonia. Carbohydrates, including the sugar backbones of nucleic acids, were also synthesized by incubating formaldehyde with an inert polar polymer, alumina, in the presence of some naturally occurring minerals.

Compounds, however, were synthesized only when sufficient starting materials were incubated with the right kind and right amount of energy in a *closed* system. On the other hand, in the primordial earth's *open* system without human supervision in which all processes were random, the synthesis of these bio-organic compounds by *chance* alone is extremely improbable. Moreover, the organic compounds synthesized in Miller's experiments were all in a mixture whereas they assume certain chirality in living cells.

Problems of abiogenesis theories which are unresolved today are:

1. Polymerization of chemical monomers does not start new life processes capable of self-reproduction.



The current evolutionary models proposed to account for the origin of fossils and sequence patterns are monophyletic gradualism ... and monophyletic punctualism ... Let me suggest a third model, namely, polyphyletic punctualism, multiple lineages originating at the same time.

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2. A self-reproducing *internal* control characteristic of the cell does not come from the chemical evolution triggered by *external* forces.

3. None of the “selective conditions” for chemical evolution persist in the primordial condition. Darwinian natural selection cannot be applied at the molecular level.

4. Random physiochemical forces operate to decrease the formation and interaction of the complex molecules. Interacting chemical systems reproduce persistently and overcome disruptive changes at very low probability.

5. Self-organization theories do not address the *origin of information* in genetic materials. Darwinian evolution has no explanation.

6. Algorithms have to be pre-existent to select for the emergence of metabolism. A theory developed by biochemist Morowitz and his colleagues (not with the ID camp) accounting for the origin of intermediary metabolism presupposes a pruning or constraining algorithm, which may be physical, chemical, biological, and informational, or a combination thereof.<sup>9</sup> The thermodynamic constraints thus applied resulted in the selection of 153 organic molecules from *Beilstein*, the most comprehensive encyclopedia of organic chemistry. These molecules contain all eleven members of the most basic network of intermediary metabolism.

By using a technique called global mutagenesis in which a transposon is used to randomly insert itself into various parts of the genome using the smallest cell *mycoplasma*, scientists have discovered that the minimal number of DNA base pairs for a surviving cell to replicate and propagate its information is around 500,000.<sup>10</sup> Human DNA has three billion base pairs. Bill Gates is quoted as saying, “Human DNA is like a computer program but far, far more advanced than any we’ve ever created.” Such information cannot be originated by the random process of natural selection.

#### Discontinuities of Fossil Record and Molecular Sequence Analysis Cambrian “Explosion”

The sudden appearance of major animal forms (phyla) in the fossil record during the

Cambrian period of geologic time is called the evolution’s big bang in *Time*.<sup>11</sup> They were soft body animals which are hard to preserve. They did not appear to be accidents in the fossil. The Darwinian theory would predict the gradual appearance of more complex body plans in the fossils preceded by simpler intermediate forms. However, the fossil shows unicellular organisms such as cyanobacteria around three and one-half billion years ago and then suddenly the Cambrian explosion 530 million years ago, with nothing much appearing in-between. This discontinuity poses a problem for gradualistic evolution.

A new paradigm of punctuated equilibrium was proposed to explain this abrupt phenomenon. However, this paradigm lacks empirically documented mechanisms. Simon Conway Morris, a theist, has published *Life’s Solution: Inevitable Humans in a Lonely Universe*,<sup>12</sup> in which he suggests that the fossils evolved with the various body plans to finally bring about humans as a goal. This idea is similar to the fine-tuning model in cosmology—the universe is fine tuned in such a way so that the earth is in the condition to allow life to emerge. The fossils are evolving in accumulating the complexity such that the ultimate appearance of humans is made possible.

#### Molecular “Strategies” in Biological Evolution

More recently, in the discussion of genome comparison and sequence analysis, a new characterization scheme of three domains instead of the traditional five kingdoms of life has developed. They are the domains of Bacteria, Archaea, and Eukarya. The current discussion in evolution is the search for a universal cellular ancestor. However, the data do not necessarily support the single origin of these domains, but rather three separate cellular origins. I did an analysis myself to investigate the sequence patterns by examining close to 5,000 proteins and thoroughly tracing 250 of them on the basis of similarities by using the search engine BLAST. I found sixty-eight proteins that fulfilled three criteria:

1. Functional for the whole cell. Thus, with very few exceptions, I excluded putative sequences as well as proteins from mitochondria or chloroplasts.

2. Diverse origins. Diverse proteins were selected with at least four species represented in each of the three domains. Gram positive and gram-negative bacteria, plants, and animals were selected when available.

3. High degree of structural similarities. Of the 420 total analyses performed, almost 85% conformed to grouping into three monophyletic domains. Only 5.43% are indistinguishable. The rest distinguishes two but not three of the domains.<sup>13</sup>

The current evolutionary models proposed to account for the origin of fossils and sequence patterns are *monophyletic gradualism*, single origin with a gradualistic appearance of multiple complexity, and *monophyletic punctualism*, single origin with sudden appearance of multiple lineages. Let me suggest a third model, namely, *polyphyletic punctualism*, multiple lineages originating at the same time. This third model may be more consistent with the currently available data. (See Figure 1.)

Lynn Caporale, an evolutionist who is by no means a sympathizer of ID, has recently proposed that there are mechanisms which are being selected in evolution.<sup>14</sup> She suggests that natural selection is not only acting on individual mutations, but also on patterns, such as those in the Cambrian fossil explosions, or on the sequence homologies of the three domains. They are being selected at once. One of these patterns called *homeobox* is found in all cells except bacteria which are not complex enough for this differentiation. Homeobox has similar sequences in all organisms but it regulates different developmental pathways. In fruit flies, it regulates the development of antennae. In mice, it regulates another pathway unrelated to the fruit fly's antenna. Evolution suggests that it is being passed on by natural selection. But the question is what is being passed on? *Homeobox* is a switch that turns on and off certain functions without making any product. Only when a gene makes a product will it be selectively advantageous or selectively disadvantageous. These switches are found in most cells as algorithms which emerge and

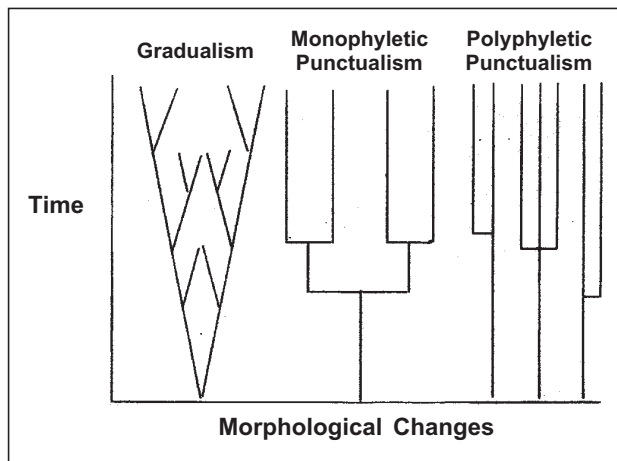


Figure 1. Proposed Evolutionary Models to Account for the Origin of Fossils and Sequence Patterns.

have to be selected as patterns although we do not know how they get there. The ID theorists would suggest that we look for these patterns without worrying about their evolutionary origins. This approach may become more productive in finding other similar genes.

#### Multiple Point Mutations in Duplicated Genes May Be More Efficient in Microevolution

Some other empirical research, which is informed by the ID paradigm, done by Behe and Snoke suggests that multiple mutations may be more efficient in gene duplication mechanisms in evolution.<sup>15</sup> In other words, instead of the gradualistic accumulation of point mutations, patterns of multiple mutations occurring simultaneously according to the algorithms they developed may be more efficient in protein evolution in this simulation. Patterns have to be present at once before selection can occur.

#### "Irreducible Complexities" of Biological Systems

The irreducible complexity idea made famous by Behe<sup>16</sup> has been criticized by others such as Miller.<sup>17</sup> It has been said that the components of the flagella system claimed to be unique and irreducibly complex in the flagella can be found in other organisms and used for other functions. However, the point is the corporate integrity of all of these components put together at once to work for the bacteria for chemotaxis. The fact that these components can be used in other organisms for other functions is beside the point. The lack of step by step gradualistic mechanism by natural selection makes the flagella system irreducibly complex. Although there are recent attempts to try to provide such an explanation,<sup>18</sup> they are merely reiterations of the old argument that they were used in other organisms for other functions but were co-opted by the bacteria for chemotaxis. The detailed step by step gradualist mechanism that can be tested experimentally is still missing. In other words, we do not know how the system gets there but it is there.

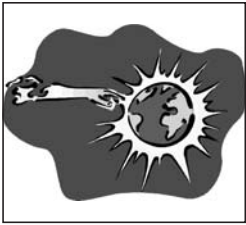
Finally, although I am not necessarily an advocate for ID, I would like to ask you to consider it as a possibility instead of eliminating it as not being a rule of the games. It needs time to develop as a scientific paradigm. First of all, let me clarify four misconceptions:

(1) ID is not primarily an apologetic tool.

What the ID people are saying is that ID is not an apologetic tool for the theologians or creationists to defend the Bible although it is consistent with it. It is a way of looking at the data. They are interested in the pattern, the design, but not necessarily the designer. *The concept of the Designer is a philosophical and theological question. The detection of patterns or design is a scientific question.*

(2) ID is not young-earth creationism.

Although there are young-earth creationists who are among the ID supporters, ID itself is not synonymous



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*Before we rule out ID as scientific because of its religious overtone [let us] examine*

- *Whether its arguments are sound,*
- *Whether its evidence for design is solid,*
- *Whether its critique of materialistic accounts of evolution holds up,*
- *Whether it is developing into a fruitful scientific research program, and*
- *Whether it is convincing to people with no stake in the outcome of this debate.*

with young-earth creationism. I know of an ID advocate who does not believe in a creator, that is, an atheist who is interested in looking at the design, but not the designers.

(3) ID is not against microevolution.

The microevolution theory, namely, diversification by natural selection, has been amply documented. The fact that we have at least two races in this room is a good illustration. If we are descended from Noah's three sons, they cannot be one white, one yellow, and one black, or else there may be something wrong with Noah's wife. The development of the major human races from one source is well explained by the process of microevolution. Darwin has made a great contribution in proposing the mechanism of natural selection to help us understand species diversification.

(4) ID is not a God-of-the-Gap stopper.

ID is providing an alternate research program to examine available data. It is "methodically developing a line of research about which creationism has been ambivalent."<sup>19</sup> Dembski proposed an explanatory filter which can eliminate phenomena explainable by natural laws or by chance before we can assign patterns such as those I have suggested in the three domains of life. In other words, ID is a research program. It is not a God-of-the-Gap science stopper: "God says it. I believe it. That settles it for me!"

Stephen Meyer, a philosopher of science claimed recently in a controversial paper published in an evolutionary journal:

An experience-based analysis of the causal powers of various explanatory hypotheses suggests purposive or intelligent design as a causally adequate—and perhaps the most causally adequate—explanation for the origin of the complex specified information required to build the Cambrian animals and the novel forms they represent. For this reason, recent scientific interest in the design hypothesis is unlikely to abate as biologists continue to wrestle with the problem of the origination of biological form and the higher taxa.<sup>20</sup>

(The editor was fired after publishing the article, and it was found by a Congressional

investigation to be a case of religious discrimination because the editor is an Orthodox Christian who is skeptical of Darwinian theory.<sup>21</sup>)

In fact, not only philosophers, but theologians and knowledgeable intellectuals are opposing Darwinian evolution. Over seven hundred scientists, including Dr. Schaefer in our midst today and scientists from the US National Academy of Sciences; the Russian, Hungarian, and Czech National Academies; as well as from universities such as Yale, Princeton, Stanford, MIT, UC Berkeley, UCLA and others, have signed the following statement since its inception in 2001:

A Scientific Dissent From Darwinism

*We are skeptical of claims for the ability of random mutation and natural selection to account for the complexity of life. Careful examination of the evidence for Darwinian theory should be encouraged.<sup>22</sup>*

## Some Research Projects Using ID Presuppositions

In conclusion, I would like to suggest some research programs that can be followed by using the ID paradigm instead of the evolutionary paradigm.

1. *Possible functions of "junk DNA" in the human genome.* It is interesting that after the sequencing of the human genome was completed, we discovered that we have only 30,000 or fewer genes in our chromosomes while the worm *C. elegans* has 19,000 genes. David was very prophetic in the Old Testament to suggest that we are just like a worm since we have similar numbers of genes. Ninety-five percent of our DNA is categorized as so-called "junk DNA" which is repetitive and to be spliced out as introns. But they may be involved in some sorts of regulatory mechanisms such as alternate splicing. The evolutionary paradigm would suggest they are vestigial sequences which can be eliminated. The ID paradigm would look for useful patterns in these sequences which may prove to be functional. These are different research programs that can produce different research answers.

2. *Nonrandom mechanisms in genomic evolution.* Nonrandom mutations and evolution is a novel and yet very controversial idea.<sup>23</sup>

Whether there are some “purposeful” mutations and mechanisms that do not happen at random is being brought up as a research program which is consistent with the ID paradigm.

3. *Endosymbiogenesis of mitochondria and chloroplasts.*<sup>24</sup> Chloroplasts and mitochondria are organelles of eukaryotic cells. How do they develop in the first place? They may be considered to be developed from a pattern of symbiosis between a protozoan such as an amoeba engulfing a bacterium without digesting it. The evolution paradigm would predict survival of the fittest. They should have killed each other in order to survive. Somehow they develop as symbiosis. So they may be dependent on each other. This is better explained by the ID paradigm, which suggests the pattern of symbiosis may be pre-existent in the mutually dependent cells for them to evolve together.

4. *Unique gene expression related to particular organisms or species in microarray studies.* Unique gene expression in human chromosomes may be used as diagnostic tools in human diseases. I am personally involved in such a project in collaboration with my former student who is the head of thoracic surgery at Harvard Medical School.<sup>25</sup> They have developed a microarray platform for analyzing human gene expression and found patterns of human genes based on the analysis of the genomes of tissues collected from his cancer patients over the years. His laboratory is performing the clinical and experimental studies. Students in my bioinformatics class and research are involved in analyzing the patterns.<sup>26</sup> The discovery of these patterns allows us to categorize different kinds of cancer at different stages. This kind of research has diagnostic application, and in some cases, maybe even prognostic and therapeutic applications, if the cancer is discovered early enough.

Therefore, as open-minded intellectuals, let me suggest that before we rule out ID as scientific because of its religious overtone that we examine

- Whether its arguments are sound,
- Whether its evidence for design is solid,
- Whether its critique of materialistic accounts of evolution holds up,
- Whether it is developing into a fruitful scientific research program, and
- Whether it is convincing to people with no stake in the outcome of this debate.<sup>27</sup> ♦

## Notes

<sup>1</sup>Genesis 1:26–28.

<sup>2</sup>John 17.

<sup>3</sup>2 Thessalonians 1:11, Ephesians 4:1.

<sup>4</sup>Hebrews 1:2.

<sup>5</sup>P. Pun, “Evolution” in *Evangelical Dictionary of Theology*, 2d ed., ed. Walter A. Elwell (Grand Rapids, MI: Baker, 2001), 415–22.

<sup>6</sup>P. Pun, *Evolution: Nature and Scripture in Conflict?* (Grand Rapids, MI: Zondervan, 1982), 256. Electronic version, copyright © 2002 by Interdisciplinary Biblical Research Institute is available at [www.ibri.org/DVD-1/Books/Pun\\_Evolution/Pun\\_Contents.htm](http://www.ibri.org/DVD-1/Books/Pun_Evolution/Pun_Contents.htm) Last accessed March 6, 2007.

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