Issues in Biology and Creation

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38th Faith and Learning Seminar
13-24 July 2008
Loma Linda, California

Introduction

Biblical creation brings a number of insights to the study of living organisms. At the same time, creationists find a number of challenges from the science of biology. The purpose of this paper is to explore some of these insights, and to point out some of the challenges. I begin by defining what I mean by "creation."

By **creation**, I mean the concept that God acted directly, through personal agency, to bring living organisms into existence. He may have created the first organisms *ex nihilo* (e.g., the universe), or from non-living materials (e.g., Adam), or in some combination (e.g., feeding the 5000). Since the original creation, the number of individuals, but not the number of independent lineages, has increased through reproduction. Species have changed since the original creation, and various created lineages have diversified into varieties and species as some of their populations lose the ability to interbreed.

Creation in this sense does not include the proposal that God caused life to appear through secondary processes, such as by guiding the process of evolution. Whatever changes may have occurred since the creation have come about as new individuals are produced through reproduction. The formation of new individuals may not require God's direct agency, other than in the general sense of God sustaining the existence of the universe. Hence, I do not use the term "creation" for the formation of new individuals through reproduction. In the sense used here, God (directly) created only the founders of each independent lineage.

Creation entails the concept of multiple, independent, separately created lineages. This is in opposition to the claim that all organisms have descended from a single common ancestor. The proposal that biodiversity consists of a large number of lineages of independent origin is a notion we may call **polyphyly**. Polyphyly is a *sina qua non* for creation theory.

Creation is a concept that depends on God's direct action in nature; thus creation has a supernatural basis. This raises a question regarding the relationship of creation to science. If science is defined as a system of explanations solely in terms of "natural laws," then creation is beyond the scope of science. Indeed, questions of origins are historical, rather than experimental, and so may be beyond the reach of scientific investigation anyway. The inability of science to reproduce the origin of life or of anatomical structures adds weight to this suggestion. However, most scientists have attempted to incorporate

questions of origins into their concept of science. To the extent that the topic of origins is included in the concept of science, creation theory is a legitimate part of the discussion.

Issues in biology and creation -- an overview

Several issues appear when one attempts to incorporate biological science into a worldview based on Biblical creation. I will identify six of these issues in this section, and then choose three of them for a more extended discussion in the next section.

Issue 1: The relationship of humans to other organisms.

The Bible describes the creation of humans in an act of creation separate from the creation of any other type of organism (Genesis 1:27; 2:7). Biological studies have revealed that humans share a large number of traits with other species such as the great apes, and especially with chimpanzees. The relationship of humans to other organisms affects the basis of salvation, and so is an important issue in integrating biological science into a Biblical worldview.

Issue 2: The origin of death and its relationship to humans

The Bible describes death as an unnatural intruder into the originally perfect creation (Genesis 2:17; Romans 5:12; Revelation 21:4). Death is the result of human sin, as Adam forfeited the rulership of this world to Satan. Biological studies show that death is an important part of the natural system. Without death, the world would soon be overpopulated with organisms, resources would be exhausted, and the inevitable result seems to be death, or at least a complete cessation of activity.

The origin of death is also important in the Biblical plan of salvation. Death is said to be the result of sin, but salvation is available because Jesus voluntarily sacrificed Himself in our place, so that His death becomes a substitute for our (eternal) death (Romans 5; Isaiah 53: Colossians 1:20; 1 Peter 2:24). In this context, the death we experience on this world is only temporary. However, if death is natural rather than the result of human sin, then Christ's death seems irrelevant, and we are left to attempt to devise some other means of finding salvation through our own efforts. The origin of death is a critical issue in the Biblical worldview.

Issue 3: Providence, natural evil and the Fall

Providence is the term used to refer to God's continuing actions in governing the universe. According to Scripture, God is active in nature and in human lives, preserving life and bringing blessings or corrective curses. He cares even for the sparrows and the flowers, and much more so for humans (Matthew 6:25-33). This is despite the human estrangement from God due to the Fall into sin.

Biological science does not see evidence of Providence in nature. The fossil record reveals that a huge number of species have become extinct, which seems to imply the

indifference of God. Death, disease, parasitism, predation and pointless pain are widespread. Fear is such a constant part of animal life that most wild animals exhibit a high state of nervous tension and watchfulness for danger. This is a great contrast with the peaceable kingdom described in Scripture as the will of God. The problem of natural evil has generated almost unlimited discussion and comment, and remains an issue of great interest for those who seek harmony between science and the Biblical worldview.

Issue 4: What is the explanation for the dinosaurs?

The Bible does not say anything about dinosaurs specifically, but it does clearly state that God is the Creator of everything that exists (Exodus 20:11; John 1:3: Colossians 1:16-17). This must include the dinosaurs, or at least their ancestors. Paleontologists (those who study fossils) have discovered many different kinds of dinosaurs, some of them very large and armed with fearsome teeth and claws. Did God actually create such huge predators? How could humans survive amid such dangerous beasts? And why did they go extinct? What kind of God would create such creatures and then later destroy them? The questions here are really a kind of subset of the questions relating to Providence and natural evil, but the popularity of dinosaurs makes this question worth considering separately.

We will not have time to explore this question in detail, but a few comments can be made. First, dinosaurs did exist. Second, God created the original ancestors of the dinosaurs. Third, many of the dinosaurs were vegetarians, and not necessarily the result of evil. Fourth, some dinosaurs seem quite fearsome, and may well have been corrupted by Satan's evil activities. Fifth, there is no evidence of any dinosaur surviving the Flood, it seems likely they were all destroyed by a combination of asteroid impacts and flooding. Dinosaurs are interesting fossils, but our knowledge about them is quite limited.

Issue 5: How did the land animals get distributed as we see them today?

The Bible describes a great global catastrophic flood that wiped out the land animals except for those in Noah's ark. After the great flood ended, the land animals dispersed from the ark to re-populate the earth. This brief description leaves certain observations unexplained. How did the marsupials get to the isolated continent of Australia? And why is there such a diversity of marsupials in Australia that is unlike anywhere else? We might also wonder why each of the southern continents has such distinctly different land faunas. Admittedly, it is difficult to determine what happened in the prehistoric past, but the distribution of land animals seems to present a difficulty for those who wish to integrate biological science into a Biblical worldview.

We will not have time to explore this issue here, but we should note that it is not necessary to suppose that every living species was on the ark. First, Genesis 7:22 describes the ark animals as having nostrils and walking on the land. This refers only to terrestrial vertebrates, not to insects, worms, or spiders. These groups could survive for weeks inside floating logs and debris. Second, the aquatic species could not have survived on the ark, and nothing is said about them being on the ark. Third, many plants

can survive in water and would not need the ark. Noah did take some seeds with him, so some kinds of plants were preserved in the ark, but probably only a small fraction of the total variety God created. Fourth, each of the lineages preserved on the ark may have diversified since the flood, producing many living varieties and species. Every living species of terrestrial vertebrates was represented on the ark by some ancestral member of its lineage, but not necessarily in every variety seen today. Thus, there is no reason to suppose the ark did not have enough space to hold the animals that were preserved during the flood. Fifth, the entrance of the animals into the ark must have been supernaturally guided, since wild animals would not spontaneously assemble in an empty boat. It is reasonable to suppose that God may have given them some assistance in post-Flood dispersal as well. How this might have happened is totally unknown, but one may conjecture that it could have been accomplished by angel guides, or by providing a dispersal instinct.

Issue 6: Human stewardship of the earth

God gave humans responsibility for taking care of this world (Genesis 1:28; Psalm 8:6). Even though Satan has usurped man's authority over nature (Job 1:6; John 12:31), God still holds humans accountable for the way we treat the rest of the creation (Revelation 11:18). This involves several issues, such as care for the environment, genetic engineering, and human economic practices. For example, should we set aside certain areas as preserves for rare species, even if it requires removal of some humans from their land? Or, is it morally permissible to transfer a gene from one species to another in order to improve its benefit for humans, or to enhance its ability to survive? What about transferring genes into humans to prevent disease? Does God will that humans suffer from disease so that this would violate God's will?

Other questions might involve the wise use of medical resources. Is it morally wrong to give enough medication to a suffering, terminally ill patient that their death is accelerated? In contrast, should an elderly patient be given heroic and expensive medical treatment that would, at best, postpone their death by only a few days or weeks. These are questions for which the answers are dependent to a large degree on one's view of creation. Creation provides a foundational basis for assessing the morality of such issues, although some issues are so complex that much effort is needed to identify the Biblical principles that reasonably apply in a particular situation.

Relationship of humans to other animals

The relationship of humans to other animals is an important issue in integrating biology and creation, because it is closely linked to the way we view ourselves and our standing with respect to God.

1. Scriptural teaching on human relationship to other animals

Scripture describes the creation of Adam, formed by God from the dust of the ground (Genesis 1, 2). Eve was created, probably a short time later, from one of Adam's ribs.

Four attributes of humans are mentioned in Genesis 1 and 2: Adam and Eve were created to be in some way like God (in the image of God); they were given dominion over the other creatures (with the implication of responsibility for their care); they were given the marriage relationship; and they were given moral accountability (instructed not to eat of a certain tree; given responsibility for governing the world).

Land animals were also created from the earth ("Let the earth bring forth living creatures. Genesis 1:24), but they were not given the same qualities as humans. Animals differ from humans in each of the properties listed above. They were not made in God's image. They were not given dominion, but are subject to the dominion of humans. They were not given marriage, but have a variety of mating systems. Animals are not subject to moral guidelines, although an animal that kills a human is to be destroyed (Genesis 9:5). The provision of plants as food for humans and other animals implies a lack of violence in nature, a condition that was lost with the entrance of sin, and which called for destruction of the world (Genesis 6:11; cf Isaiah 11:6-9, Revelation 21:1-5). The uniqueness of humans is emphasized throughout the Bible, while animals are regarded as created for God's pleasure (Revelation 4:11) and for man's service.

2. Evolutionary biologists interpretation of relationship of humans and apes

Most biologists, on the other hand, do not see such a great difference between humans and other animals, particularly the chimpanzees and other great apes. Anatomically, the similarities are quite obvious; for example, the teeth and internal organs of the chimp closely resemble those of humans. The two species even have similar blood types and parasites.

This close resemblance between humans and chimpanzees extends to genetic details as well. Comparison of DNA sequences shows that the two species are extremely similar genetically; the differences in their DNA sequences are less than 5%. Some strains of fruit flies differ in their DNA sequences more than do humans and chimps. Furthermore, humans and chimps share certain DNA sequences, called pseudogenes, that look like mistakes made during copying of the DNA. Pseudogenes are thought to have no function, but to be inherited from a common ancestor that experienced a mistake in DNA copying.

The fossil record provides additional evidence that has been interpreted as indicating a close relationship between humans and chimpanzees. Several fossil forms have been found that have anatomical characteristics intermediate between apes and humans. Fossil hominids can be arranged in a sequence, starting with forms having chimp-like characteristics, continuing with forms having intermediate characteristics, and ending with anatomically modern humans. This fossil sequence looks much like what an evolutionary sequence would be expected to look like.

The proposal that humans and chimpanzees share a common ancestry seems to many scientists to be a reasonable explanation for their close anatomical similarity, close genetic similarity, and the existence of a sequence of fossils with intermediate traits. What is a creationist to say in response?

3. Creationist interpretation of similarities of humans and chimps

Creationists can point out several difficulties in the hypothesis that humans and chimps have a common ancestry. First, the Bible is clear that humans were created separately from any of the animals, through supernatural agency. Thus, the similarities of humans and chimps must have some explanation that does not involve common ancestry. Many creationists would suggest that similarities among different species may be explained by common design. Since both humans and chimpanzees were created by the same Creator, one should not be surprised to see similarities in design. It is not necessary to invoke common ancestry to explain their similarities; the similarities may be due to common design.

Common design may apply both to anatomical and genetic similarities, with the possible exception of pseudogenes. If pseudogenes are truly degenerate gene sequences, it would seem difficult to use common design to explain the presence of the same degenerate sequence in both humans and chimps. This question presupposes that pseudogenes are actually degenerate genes. Recent evidence suggests[1] that some pseudogenes may have a function. If pseudogenes are actually DNA sequences with a cryptic function, the common design explanation may apply. If not, one would look for some mechanism which might cause similar changes in similar sequences. Viruses have the potential for changing DNA sequences, and might, in some cases, have sequence-specific effects, although viruses have not been identified as a cause of pseudogenes. Since evidence is weak for pseudogene function or for the existence of a mechanism causing parallel sequence changes in different species, pseudogenes arguably may favor the common ancestry hypothesis.

Another difficulty with the common ancestry hypothesis is that the limited experimental evidence available does not suggest that it is possible to modify an ape-like creature into a human. This would require an increase in complexity of the brain, especially in the portions devoted to speech, self-awareness and abstract thinking. One might imagine a degeneration of a human into an animal-like form, but it seems unlikely that a mechanism exists that would modify an animal into a human.

There are at least two difficulties in the fossil record for the hypothesis of common ancestry. First, the fossil forms seem to form natural groups, one of which is human-like while the other group (the australopithecines) is more ape-like[2]. The human-like group includes *Homo erectus* and its allies, *H. neanderthalensis*, and *H. sapiens*. There may be no genealogical linkage between the two groups. Second, no fossil species can be identified as the ancestor of humans. The two groups may just as well have separate origins.

4. Summary of the arguments

In summary, the evidence for common ancestry is equivocal. The strongest arguments in favor of common ancestry are pseudogenes and the fossils. The strongest arguments

against common ancestry include divine revelation, experimental evidence that fails to provide a mechanism for increasing complexity, and the uniquely human features such as language, abstract thinking and self-awareness. The evidence used to argue for common ancestry may have another explanation. Similarities may be due to common design, pseudogenes may actually have a function, and the lack of direct links between the australopithecines and the human-like fossils may reflect separate ancestries. In the end, the scientific evidence permits one to choose either hypothesis, while the Biblical evidence does not.

The origin of death and its relationship to humans

The origin of human death is an important issue in integrating biology and creation because of its implications for the Biblical teaching that Christ's death paid the penalty for our sin, thus freeing us from death and making it possible for us to have eternal life.

1. Scriptural teaching on the origin of death

The Bible describes death as an enemy, introduced into the world as a result of the sin of Adam and Eve (Genesis 3:17-19; Romans 5:12). Because of sin, death became the lot of all living organisms. The causal linkage between sin and death is the basis for Christ's self-sacrifice on Calvary (Romans 5). It is God's will that death not be present in the future life, according to John (Revelation 21:4). In Revelation 20:14, death is described as the last enemy to be destroyed. The Bible writers seem clear that death was not originally part of the creation, and will eventually be eliminated in the new creation.

2. Biologists' interpretation of origin of death

Most biologists consider death as present from the origin of life, which they take to have occurred hundreds of millions of years ago. In this view, death is not only natural, but necessary. First, death prevents over-population. Second, death permits species to adapt to a changing environment by eliminating those individuals that cannot adjust to the changes. Third, death results in the recycling of nutrients, providing a continuous supply for new individuals. Fourth, many organisms seem well designed for causing the deaths of other organisms. Examples include cats, spiders, owls, sharks, snakes and frogs. There are no vegetarians among these groups. Fifth, predation seems designed into our ecology, and it is difficult for many scientists to see how it could be eliminated completely. Some Bible writers even see the hand of Providence in the activity of predation (Job 39:26-30; Psalm 104:21).

3. What is meant by "death"?

The issue of death before sin is a critical issue for our understanding of the nature and character of God, the nature of the atonement, and God's will for the new creation. But what exactly do we mean when we talk about "death"?

The word "death" is used in a variety of meanings. Biologists talk about "cell death," in which cells within a body are disassembled and the materials used to construct new cells. This occurs constantly as our bodies repair themselves. "Cell death" even occurs during the growth of an embryo, as new tissues are produced, replacing previous tissues in an orderly sequence of body development. It seems unreasonable to suppose that this is the "death" the Bible writers had in mind. First, they knew nothing about such processes. Second, no one considers the development of a baby to be a death; rather, it is a new life. Third, a cell in this case is only a small part of a larger unit, and the unit continues to function even as some of its cells "die" and are replaced. "Cell death" has nothing to do with "death" in the Biblical sense, or in any ordinary sense of the word. Hence, there is no good reason to suppose it is the result of the Fall, or that it will be absent in the new creation. Biblical death is not referring to cells, but to individuals.

The common meaning of "death" is that an individual's body has stopped functioning, irreversibly and permanently. Generally, death refers to the entire individual, and not to parts of an individual. One may sever a part of a body without causing the death of the individual, as for example, when an appendix is surgically removed. Eternal life is promised to individuals who accept Jesus Christ, not to body parts. Biblical death refers to the death of individuals, not of cells or parts of individual bodies, whether human or animal.

It may be useful to point out that the absence of death is not the same as the absence of the second law of thermodynamics. At present, the second law drives the process of decomposition as the materials composing the body undergo chemical changes that destroy their function. Since a body does not decompose unless it has first died, and there is no death in heaven, there is no decomposition either.[3] The potential for decomposition itself is not necessarily absent from a perfect world. Waste products, if there are such in heaven, could still be broken down chemically, and food digestion could still occur. It is death and decay, not chemical reactions, which is absent in the new creation, and, presumably in the original creation.

The issue of "plant death" deserves special mention. Is it possible to eliminate plant death? Does one not cause the death of an apple when one eats it? Three points can be made. First, as noted above, it is only the death of an individual that is of concern. An apple is not an individual. Eating an apple does not cause the death of any individual and hence is not an issue here. Second, before sin entered the world, God specifically provided plants to be food for animals. Evidently, plant material will be eaten in the new creation. Humans will eat of the tree of life. Isaiah describes a world that could occur if Israel were faithful, in which lions would eat straw. Third, the Bible writers seem not to have considered plants to have life. Life was associated with blood, and plants lack blood, so they seem to have been regarded as lacking life. For example, Jesus referred to plants as being green or dry, when we would say alive or dead. Therefore, there is no Biblical basis for supposing that eating apples or plant material has any bearing on the question of death before sin.[4]

A final issue is whether the absence of death before sin extends to the entire animal kingdom, or only to humans, or only to the higher vertebrates. One way to attempt to answer this might be to determine which animals the Hebrews regarded as alive, and thus capable of dying. As noted previously, plants were not generally regarded as alive or subject to death, so their relationship to sin is not clear. The Bible makes a number of references to the status of animals as alive or dead. Animals with blood would clearly be regarded as alive (Leviticus 17:11, 14), and subject to death. This would include at least the birds and mammals. Fish and frogs are considered to have died during the Egyptian plagues (Exodus 7). The worms that feed on carcasses are said not to die, implying they are alive (Isaiah 66 and Mark 9). Solomon refers to dead flies in Ecclesiastes 10:1. Marine invertebrates are probably intended in Psalm 104:25, which describes them as living. Thus it appears that the Hebrews probably regarded both vertebrate and invertebrate animals as alive, and I conclude (somewhat tentatively as regards the invertebrates) that the promise of a paradise free of death may apply to them as well. But this raises some questions.

4. Problems of a death-free world

I have concluded that there was no death in the original creation before the entrance of sin, and there will be no death in the new creation. Critics of this conclusion have raised several questions relating to the lack of death before sin. If animal death was not a part of the original creation, how did God intend nutrients to cycle? And what would prevent overpopulation as animals fulfilled the divine command to multiply? How could accidental death be avoided, such as when an elephant might step on an ant? Might not predation be useful to remove individuals and prevent their carcasses from littering the "streets of gold"? It may be difficult to conceive of a world so different from our own, but this is necessary in order to evaluate such questions.

A death-free world would have different ecological relationships from the present world. In the present world, nutrients are recycled through both death and animal wastes. In a world without death, the need for recycling would be greatly reduced, because reproduction would also be absent. Reproduction and death must be in balance. One cannot be present without the other. Both would be absent in a death-free world, and recycling of nutrients would not be such a problem as in the present world.

The lack of reproduction would solve the overcrowding problem also. Without reproduction there would be no overcrowding. In the original creation, reproduction could have continued until the earth was "filled," and then ceased.

As for elephants stepping on ants, it is remarkably difficult to kill an ant by stepping on it unless it is on concrete or some other hard surface. An ant walking on the grass is almost impossible to kill by stepping on it. Although an elephant's foot would exert a greater force than a human foot, the difference may be less than one might expect because the additional weight of an elephant is distributed over the wider surface of its feet. It should also be pointed out that ants are largely scavengers, and there would be little need for them in a death-free world. On the other hand, invertebrates brains may lack the ability to

be conscious of pain, and the present evidence may be insufficient to eliminate the possibility that their deaths have no moral significance.

Another issue is whether death by predation is needed to remove aging individuals. The Bible seems to provide a rather clear answer: predation is the result of sin. First, plants are the only food provided for the animals in Genesis 1. Second, predation is a form of violence, and God condemned violence and sent the flood to prevent it from getting worse (Genesis 6:11-13). Third, in Isaiah 11:6-9, and 65:25, God promises a world in which serpents, wolves, lions and bears no longer kill other animals. Thus it is His will to eliminate predation. Critics of this position have appealed to texts such as Job 38:39, Job 39:26-30, and Psalm 104:21 as evidence that prey animals are providentially supplied as food to predators, but these texts are applied to the present world, not to the world before sin or the world after sin. Paul notes that all creation groans under the curse (Romans 8:22), so one cannot appeal to the present world as verification of the existence of predation in a sin-free world. There is no evidence that aging or death will be a problem in the new creation.

In summary, I conclude that the death brought on by sin includes the death of animals, but not the "death" of cells or fruits. The fact that this implies ecological relationships very different from those of our present world is not an argument against this conclusion, but a reminder that sin has affected our world in profound ways.

Changes since the Fall

The question of how much change has occurred in animals and plants since the Fall is important because of the implications for God's character and will. What kind of God would create animals to tear each other apart for food? Is such behavior God's first choice, or is predation a result of sin? Is natural evil a result of sin or of God's choice?

a. Scriptural teaching on changes in nature since the Fall

The Bible describes an originally perfect creation that was distorted by sin. A new creation is promised, in which the earth is restored to the state God intended for it. The new creation, and by implication the original creation seems to have been without death. This is a vastly different world from the one we observe today. This implies that very widespread and significant changes must have occurred since the Fall (cf. Romans 22-23).

The Bible affirms that nature has changed since the creation. First, nature has been cursed as a result of sin. God cursed the serpent so that it must crawl on its belly (Genesis 3:14). It must have had some other form of locomotion previously. God also cursed the ground and predicted the appearance of thorns and thistles (Genesis 3:17-19). Although no direct curse was pronounced on Adam and Eve, their lives were greatly affected by the curses on nature (Genesis 3:16-19), and their descendants have been cursed in several ways (e.g., Genesis 4:11, 9:25; Deuteronomy 27, 28; Jeremiah 17:5, 48:10; Malachi 3:9).

Second, Genesis 2 describes some things as not yet in existence when Adam and Eve were created. These include plants of the field, herbs of the field, rain, and farmers. According to Younker[5] the Hebrew terms may refer to xerophytic plants, the cursed plants that would provide food for Adam as a result of his fall, rain, and farmers. None of these was present before the Fall. Thorns and thistles also appeared after sin, and were not present in the original creation. These are all familiar today, which means that changes have occurred since the creation.

Third, Romans 8:19-22 describes the creation as groaning from the effects of decay, while waiting for relief in the new creation. According to Romans 5:12, death entered the world through the sin of one man (Adam). The absence of decay in the new creation should not be taken to imply a change in the second law of thermodynamics (disorder naturally increases over time), but instead a change in living organisms such that they are resistant to decay processes.

Fourth, the Bible notes that Satan has had an effect on nature. In Job 1 and 2, Satan is identified as causing the disasters that befell Job. These included fire from heaven and a great wind. Satan is identified as representing himself as one of the "sons of God" (cf Luke 3:38), apparently taking Adam's place (Genesis 1:28) as ruler of this world (John 12:31, 14:30). Ellen White identifies Satan as responsible for thorns and thistles and noxious weeds (2 SM 288), and for corrupting nature in other ways (3 SG 64, 75).

Nature no longer perfectly reflects the character of its Maker, but has been subject to changes resulting from sin. Nevertheless, the hand of God can still be seen in nature (Psalm 8; 19:1-6; 104; Matthew 6:26-30, etc). Nature reveals the existence of a creator, although not very much can be known from nature alone (Romans 1:19-20).

b. The process of change in species

Biologists recognize that species have changed, and have spent much effort to investigate the mechanisms causing the changes. Mutations in the DNA sequence are believed to be the cause of change in species. Information is stored in the DNA sequences, and any detectable change in the information can be considered a mutation.

Different DNA sequences may have very different kinds of functions. The effects of a mutation depend on where in the DNA it occurs, as well as on the details of the change. An organism that has experienced a particular mutation may be damaged and unable to survive. Or, the mutation may have virtually no effect at all; many mutations are effectively neutral. Occasionally, a mutation may occur that gives the organism some advantage in the struggle to survive. For example, a mouse that has a mutation that changes the color of its fur to match the color of the soil where it lives may be better able to hide than other mice having a different color of fur.

Natural selection is the name for the tendency for individuals with better genetic traits to survive longer and produce more offspring than those with less useful genetic traits. Many biologists believe that natural selection is the major mechanism for change in

species. Other biologists believe that chance is more important than natural selection. All biologists agree that species may change through chance or through natural selection, but they may disagree on their relative importance.

Many biologists claim that descent with modification, through natural selection, is the process by which all biodiversity has been produced from a common ancestor. According to this claim, the original organisms were single-celled, and have gradually changed over millions of years to produce all the varied species we see today. This idea is widely accepted, but is not supported experimentally. There is no doubt that natural selection does produce change in species, but it is highly doubtful that natural selection is capable of producing the new information needed to convert a single-celled organism into a multi-celled organism, or to produce a mammal from a fish.

c. Creationist views on change in species

Experimental and observational evidence indicates that species are variable, and can change rapidly in response to environmental conditions. However, the observed extent of change is relatively minor. There is no evidence to show that new organs or new types of organisms can be produced by natural selection. Yet many species seem to have complex adaptations for violence. This raises an interesting question for creationists. If nature has changed a lot since the original creation, and if natural selection seems to be ineffective in producing the extent of change thought to have occurred, then what mechanism might be responsible for changing species? Creationists have responded to this question in various ways.

Some creationists have denied that species have changed very much since the original creation, claiming that predation was part of the original creation. I have outlined considerable Biblical indications that predation was not present in the original creation. This implies, correctly I think, that species have changed extensively since the Fall, and that the proposal of pre-Fall predation is not supported.

Some creationists have taken a different approach in denying that species have not needed to change very much since the creation, claiming that most changes have involved behavior, rather than anatomy. This is quite probably true for many predators, but it is difficult to see how it can apply to all. For example, spiders are a large, diverse group, entirely predatory and seemingly well-designed for killing insects. Many parasites appear well designed to be parasites, and unable to survive without their hosts. Thus, it seems likely that more than behavioral changes are involved, and large-scale anatomical changes must have occurred since the creation. The view adopted here is that these changes are responsible for the existence of the natural evils of predation, disease, parasitism and suffering.

Three potential causes of natural evil through biological changes have been proposed. The first proposed cause is that chance and natural selection are sufficient to explain the changes in species from an environment that God declared as "very good" to the present environment dominated by natural evil. One problem with this position is its implication

that evil is inherent in nature. This seems contradictory to the character of the Creator, and to His statement that nature was "very good." A second problem is that, while this may explain some examples of natural evil, it seems inadequate to explain others. Certain species have evil design features that appear to exceed any observed or reasonably inferred power of natural selection. An example is the poison delivery system of vipers, with movable, hollow fangs connected by special ducts to modified salivary glands that produce toxins. Another example is the life cycle of certain parasitic worms, which include different stages living in different hosts. The available experimental evidence not only fails to support such powers for natural selection, but appears to indicate limits to the power of natural selection to accomplish such significant changes.

If natural processes are insufficient to explain the large-scale changes in species, some other process must be proposed. One alternative is that Satan gained access to this world as a result of the Fall of Adam and Eve. Satan's activities, either directly or through his influence on humans, could have caused the un-natural corruption of nature. If God delegated to Adam the responsibility for this world, and Adam forfeited his authority to Satan, then Satan may have gained control of this world to a greater extent than many realize. Of course, God is in ultimate control, but how could one justify the claim that God intentionally caused the present state of the world? We have reason to suspect that Satan has a major influence on nature, and that may include the ability of Satan to corrupt the genetic material of animals and plants, thus accounting for the violence and bloodshed now seen in nature.

A second alternative explanation for large-scale changes in species is that God re-designed the world after the Fall. This could have been done directly or indirectly. As an example of direct action, God's curses may have been "creative curses," which changed the world completely, introducing predation, death, disease, etc. An example of indirect action could be if God placed information for post-fall survival within the genomes of organisms. This could be actualized in a way somewhat analogous to the differences seen in some creatures under different environmental conditions, such as the white winter colors of ptarmigans and ermines, or the differences in wing pattern of the African butterfly, *Colotis eucharis*, between dry and wet seasons.

If one appeals to supernatural agency to explain the degeneration seen in nature, one has left the realm of naturalism, although one can hardly address the question without recognizing the value of both scriptural and natural data. If special revelation addresses the question, it should be regarded as more reliable than speculation. What does special revelation indicate about the cause of natural evil? First, Satan is charged with causing some examples of natural evil. Examples include the disasters that befell Job and his household, several examples of illness (e.g., Matthew 9:32; Luke 11:14, 13:16), and destruction of the pigs (Mark 5:1-13). Second, on three recorded occasions, Jesus called Satan the "prince of this world" (John 12:31, 14:30, 16:11). Third, Satan is said to have the power of death (Hebrews 2:14). Fourth, Jesus' statement that "an enemy has done this" (Matthew 13:28) is applied by Ellen White to the idea that Satan is the one responsible for noxious weeds.[6]

On the other hand, some texts credit God with causing evil,[7] although evil may not always refer to what we call "natural evil." Of course such actions are not beyond God's power, but there is no evidence to suggest that it is God's will that evil exist. It does not seem consistent with His character for Him to create, for example, parasites and disease. I think it is more reasonable to suppose that such changes are evil, and due to the activities of Satan. This point seems to be affirmed by some of Ellen White's statements.[8]

Conclusions

The study of living organisms raises several very important issues for a creationist worldview. One of the most significant of these is the claim that death occurred before human sin. This impacts our understanding of the plan of salvation. The relationship of humans to other species is another critical issue, which affects our understanding of human nature, sin, the atonement, and other Biblical doctrines. The problem of natural evil also impinges on our view of God's character, and is best understood in the context of the "Great Controversy."

There are some important areas of agreement between creation and the study of biology. We see evidence of design in living organisms, even though many biologists deny that the design is due to creation. We see evidence of change in species, although many biologists deny any supernatural causes of the changes. As creationists, we see our responsibility to care for the earth and manage it wisely, even though many biologists deny any creator to whom we are responsible.

In summary, the issues in biology and creation are critically important in understanding who we are and what is our destiny. There are many questions for which we do not have adequate answers. Examples include the nature of the dinosaurs, the nature of fossils with characteristics intermediate between humans and apes, and the means by which land vertebrates managed to get distributed the way they are. These questions should keep us humble, while stimulating us to further study.

Endnotes

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[1] Hirotsune, S. N. Yoshida, A. Chen, L. Garrett, F. Suglyama, S. Takahashi, K-I. Yagami, A. Wynshaw-Boris, A. Yoshiki. 2003. An expressed pseudogene regulates the messenger-RNA stability of its homologous coding gene. *Nature* 423:91-96.
Sasidharan, R. and M. Gerstein. 2008. Protein fossil live on as RNA. Nature 453:729-731.

[2] A phylogenetic distinction between humans and australopithecines is suggested by Siegrid Hartwi-Scherer. 1998. Apes or ancestors? Pp 212-235 in (WA Dembski, ed.) *Mere Creation: Science, Faith and Intelligent Design.* Downer's Grove, IL: InterVarsity Press.

[3] See Matthew 6:19-20.

[4] Ellen White tells us that Adam and Eve grieved over the falling of leaves after their sin.

> "As they witnessed in drooping flower and falling leaf the first signs of decay, Adam and his companion mourned more deeply than men now mourn over their dead. The death of the frail, delicate flowers was indeed a cause of sorrow; but when the goodly trees cast off their leaves, the scene brought vividly to mind the stern fact that death is the portion of every living thing." (PP 62:1).

The passage seems clear that their mourning was due to the realization that the falling leaves (and drooping flowers) were part of the process of dying and death brought on by their sin. This has nothing to do with eating leaves or fruits, which would function to sustain life rather than signal the entrance of death.

[5] Younker, R.W. 1999. God's creation: Exploring the Genesis story. Nampa ID: Pacific Press. Chapter 6, pp 50-58.. The idea is also found in Futato, MD. 1998. Because it had rained: A study of Gen 2:5-7 with implications for Gen 2:4-25 and Gen 1:1-2:3. Westminster Theological Journal 60:1-21. Another author who seems to accept this idea is CJ Collins. 2006. Genesis 1-4. Phillipsburg NJ: P&R Publishing.
[6] White, E.G. 1899. Manuscript 65; cited in FD Nichol. 1951. *Ellen G White and her critics*. Takoma Park: Review and Herald Publishing. In the same passage, White also states that Satan brought about thorns and thistles through "ingenious experiments."
[7] E.g., Jeremiah 44;11. It should be noted that the difficulties of life are sometimes referred to as "evil", as Jacob does in Genesis 47:9, so one must be cautious in interpreting such statements.
[8] See references in endnote 6.