GOD AND NATURE: AN APPROACH TO CREATION

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Introduction

"Where did I come from?" little Johnny asked his parents. Mother and Father looked at each other knowingly and sighed. The moment had arrived — and sooner than they had hoped. It was time to tell Johnny the facts of life. So, Father explained how fathers and mothers get together to produce babies. After ten minutes of carefully worded explanation, the father paused and asked, "Now do you understand where you came from?" "That's all very interesting," said Johnny. "But I want to know where I *came* from. Billy says he came from Kansas, and I'd like to know where *I* came from."

We have all asked the question, "Where did I come from?" At some point, our curiosity goes beyond our personal origins, to the question of where the whole world-system came from? We wonder whether there is some overall purpose for our life, or whether our existence is an accident. Were we created? intended? designed? Or are we simply the latest chance configuration of atoms resulting from the interplay of unconscious physical processes?

Four Questions

We have limited resources to help us determine the best explanation of our origins. There is no video archive from which we can select the appropriate video tape to view the beginnings of our world. A number of sources claim to have the answer, but their answers conflict with one another. How can we separate the right answer from all the incorrect answers? Since we cannot prove by demonstration the events by which we and our world came into being, we must use indirect methods, such as probability arguments, and reliability of sources, to evaluate explanations of origins. We will consider four key questions that may help us evaluate proposed answers to our question.

Question 1: Did Life Begin by Chance or Design?

We can begin by classifying the answers into two categories — chance and design. How can we determine which category provides a more reasonable explanation of our origins?

Are we here by chance?

Many leading scientists and philosophers assert that we, with all life, are here by chance, or more precisely, by a combination of chance and natural law, but not the result of design. What is the basis for this claim?

Science has been highly successful over the past three or four hundred years in discovering the principles operating in nature. Many phenomena that were once attributed to direct divine action have been explained in terms of physical mechanisms and "natural laws." Many scholars believe that "natural laws" can potentially explain everything in the universe, and there is no need to suppose that some events are directly caused by God. Science has been highly successful in explaining the *functions* of living organisms, and this success has been extrapolated to the claim that the same principles apply also to the *origins* of all living organisms. This extrapolation forms the basis for the conclusion that there is no need for a designer — chance and natural law, working in combination, can explain all phenomena. But there are reasons for questioning this extrapolation.

The problem of explaining the origin of life is a major difficulty for those who wish to rule out design in nature.[1] Life depends on proteins that have specific shapes which are the result of specific amino acid sequences. No "natural" inorganic process is known for making proteins. The probability of a protein spontaneously springing into existence appears to be essentially zero, based on the present state of our scientific knowledge. Even if randomly constructed proteins were somehow available, the probability of producing the correct set of proteins needed for life is vanishingly small. Our present knowledge may be incomplete, but there is no reason to suspect that there is some undiscovered "law of abiotic protein construction." The "protein problem" alone is enough to cast serious doubt on the hypothesis of origin by accident. Other considerations appear to seal the case.

Life requires much more than proteins. It also requires nucleic acids. As with proteins, there is no known "natural" process for producing nucleic acids. As far as we can determine, the probability of nucleic acids forming spontaneously is zero.

The origin of a living cell or organisms is vastly more complicated than the origin of one or two types of molecules. Life also requires the presence of membranes composed of particular types of molecules, and arranged in appropriate, highly non-random spatial configurations. No "natural" processes are known to explain the origin of living systems. In fact, "natural law" seems more likely to prevent, rather than to promote, the spontaneous origin of life. An explanation other than chance seems necessary. The only other category of explanation is origin by design.

Are we here by design?

Design implies purpose or function, which, in turn, imply an intelligent mind. To claim that the world is designed is to claim that it is the result of a decision made by an intelligent mind for a purpose. The design explanation is favored by most religious people, including many scientists and philosophers.

Some critics have claimed that design is an unreliable inference because there are no objective criteria for identifying design. Is this criticism valid?

A number of criteria are commonly used to identify design.[2] For example, consider how an archaeologist might identify a stone ax as designed. First, a stone ax has an unusual shape not normally found among stones in natural settings. Second, the ax has fracture marks on it suggesting its shape has been modified by non-random processes such as being struck against another rock. Third, this unusual shape fits the object for a recognizable function associated with human activity. Fourth, the ax shows evidence of having been used in a manner associated with human activity. Thus it appears that the stone ax was intentionally altered for a purpose. In short, it was designed.

More recently, two more sophisticated identifying marks of design have been proposed — irreducible complexity, and specified complexity. These features are thought to be reliable indicators of design, although they are not necessarily present in every object that has been designed.

Irreducible complexity[3] refers to a system composed of a number of parts in which removal of any single part leaves the system without any function. Such a system is said to be "irreducible" in terms of its functionality. It is complex because there are several interacting parts. The ordinary mousetrap is the classical example of irreducible complexity.

Specified complexity[4] refers to a phenomenon with multiple interacting parts that form or produce a recognizable pattern. In this case, the term "specified" means that the pattern in question carries some information or meaning to the observer. For example, a pattern of marks on a beach would be "specified" if it was in the form of a written message, but not if it were merely a series of ripples produced by wave action. Implicit in this idea is the notion that information is both created and understood by intelligent minds, not by mindless physical processes.

When we examine living organisms, do we see marks we might reasonably interpret as the result of design? Yes, we do. Many examples have been proposed, although not all are equally persuasive. Some examples that seem persuasive are the cilium, the blood-clotting mechanism, the living cell, the mechanism for protein synthesis, sexual reproduction, and others.

In conclusion, design seems a reasonable explanation for our origins, while chance seems highly improbable. Thus, it is reasonable to conclude that we are here as a result of design, although not everyone accepts this conclusion.

Question 2: Was Design Applied by Direct Personal Action or by Secondary Processes?

Design implies a designer. But design may be effected in more than one way. Some religious people believe that creation was brought about exclusively by secondary processes, following the same "laws of nature" we observe today.[5] Others believe secondary processes may have been used in some aspects of creation, but other aspects involved direct action on matter and energy by the designer.

The distinction between direct action and acting through secondary processes can be illustrated by comparing a painting with a photograph. Design is accomplished through direct agency in the case of a painter who directly applies the paint to the canvas. In the case of a photograph, design is accomplished through secondary processes. The pattern seen on the photographic paper was intentionally produced by the actions of a person, so we may say it is designed, but the image was not directly applied by the person. Instead, it is the result of a process involving numerous steps, several of them probably done by a machine. We may say the photographer used an indirect method, or used secondary processes, in order to accomplish his objective of creating a desired pattern of ink on the paper.

We may apply this distinction between direct and secondary causation to the question of the origins of life and of humans. Is it more likely that the designer acted directly, at least in some parts of the process, or did the designer act strictly through secondary processes? In other words, are the "laws of nature" sufficient, without direct personal action, to explain the origins of life and of humans?

Are secondary processes sufficient to explain the origin of life in general?

What do we observe in nature that can help us decide whether life came into existence through secondary processes? Is there some mechanism included in the "laws of nature" that is capable of producing life where none existed before? Two points seem especially important here.

First, as Johnny's father pointed out to him in our opening story, life comes from life. All organisms known to us have ancestors. As far as we have been able to observe, life never comes into existence in the absence of other life. This seems to be a "law of nature." However, life had to have a beginning, since the universe had a beginning. How could life begin?

No physical process is known to explain how life could arise in a lifeless environment. Life has never been observed to arise spontaneously, although many attempts have been made to produce conditions that would favor this result. Furthermore, life possesses the characteristics of design as identified in the concepts of irreducible complexity and specified complexity. These points strongly imply that "natural law" does not explain the origin of life. It is reasonable to conclude that the origin of life is best explained through the direct action of an intelligent designer.

A second point is that, once life has begun, its continuity seems to be explainable in terms of secondary mechanisms. This point is discussed in the next section.

Are "natural" processes sufficient to explain the origin of humans?

An important point in the story of reproduction is that life continues through means that appear to be "natural." Although we do not completely understand development, we strongly suspect that it proceeds in accordance with the physical and chemical properties of interacting molecules. Thus, new individuals may come into existence through secondary mechanisms.

The problem becomes more complex when we ask whether the *origin* of human life required direct action by a designer, or whether indirect, secondary processes are potentially capable of modifying previously existing organisms into humans.

Humans are distinct from other creatures. The greatest distinction is surely the human mind. Only humans have minds capable of abstract reasoning, self-consciousness, and awareness of the presence of God. This is associated with a more complex state of brain morphology than in non-humans. To create humans from non-humans through "natural" secondary processes would require a physical mechanism, driven by "natural law," that produces a significant increase in brain complexity. Do we know of some physical mechanism that could create the human brain from that of a non-human ancestor through "natural" secondary processes?

The short answer is that no physical mechanism has been discovered that can create humans from non-humans.[6] However, to prove the absence of a mechanism would require a greater understanding of developmental genetics than scientists currently have. We would need to be able to specify the differences between humans and non-humans, such as apes, in terms of genetic information and developmental processes. This information is not yet available, although scientists seem to be gradually closing in on the answers. Given our present scientific knowledge, a genetic mechanism for increasing the complexity of the brain seems dubious, but not disproved.

It might be easier to discover a general mechanism for increasing morphological complexity in living organisms, if it exists. If all living species have a single common ancestor, increases in complexity must have occurred repeatedly, and genetic mechanisms for increasing morphological complexity should be ubiquitous. If such a system could be found, it might be a candidate for a mechanism for creating the human brain through secondary processes.

We are not here referring to the mechanisms in ordinary development. Morphological complexity appears to increase during development, but only in one stage of the life cycle, and the new individual ends up with the same degree of complexity present in the parents. What is needed is a genetic system for increasing morphological complexity beyond the level of the parents. For example, it must be able to create new, more complex body plans and new organs. Is there any evidence for such a mechanism?

Bacteria provide the best understood genetic systems, but scientists are unable to guide their development to produce a more complex, multicellular organism. Although there is some evidence that bacterial genomes may be able to adapt to their environments,[7] there is at present no experimental support for the existence of a genetic mechanism for increasing morphological complexity in bacteria. It appears to be absent.

Could the needed mechanism have been lost in bacteria, and remain only in multicellular organisms? Apparently not. Genetic systems in multicellular animals provide no evidence of a mechanism for increasing morphological complexity beyond the level of the parents. Neither is there any experimental evidence that human brains can develop from non-human brains through

secondary processes. One may postulate that such a system exists, based on the fact that we do not know enough to rule out that possibility, but any claim that such a system exists is based more on philosophical preferences than on scientific evidence.

In conclusion, it seems highly probable that the origin of life, and the origin of humans, required direct personal action on the part of the designer. This is not proved, but it seems to be the best explanation.

Question 3. What Can We Know about the Designer?

If the universe, life, and humans are the result of direct personal action, it would be interesting to know more about the designer. What characteristics of the designer can we reasonably infer from our observations of the universe?

First, the designer must be very powerful. The universe is so large that extremely large forces would be required to govern it. The designer must possess the most powerful force in the universe.

Second, the designer must be extremely intelligent. Life is highly complicated, and only an extremely intelligent designer could design the universe to be suitable to sustain the physical world and its living creatures.

Third, the designer must be unbounded by natural law. If, as appears probable, the designer was powerful enough to create the universe to be suited for life, it is highly likely that the designer could have created the universe to be unsuited for life. If so, the designer must have had a choice as to what values should be given to the physical constants, since the existence of life requires appropriate values of the physical constants. Thus, the values of the physical constants, which are the basis of "natural law," must have been deliberately selected by the designer. In other words, "natural law" was established by the choice of the designer.[8] Thus, the designer is not bounded by natural law.

Next, the designer must be able to create matter and energy. The universe is made of matter and energy. Without the universe, there would be no matter and energy. To bring the universe into existence would require the ability to bring matter and energy into existence where they were previously absent. There has been some dissent on this point, but its basis seems very weak, as is shown below.

Some have proposed that matter and energy are infinite in age. In this view, the universe has undergone an infinite series of "Big Bangs" and "Big Crunches," and the fitness of the present universe for life is just a lucky coincidence.[9] There is absolutely no evidence for this proposal, and it seems highly improbable in the face of overwhelming evidence for design. One is free to accept such a proposal if one wishes, but there is no obvious reason to accept it other than because one wishes to avoid the implications of design.

Finally, the designer must be able to observe the universe while remaining unobserved. Although we see evidence of his power and intelligence throughout the universe, we are unable to pinpoint his location in time and space. This greatly limits our ability to understand him through our own efforts.

To summarize, the physical world indicates that its origin was caused by a supremely intelligent, powerful supernatural designer, but it does not identify this being. We must go beyond the study of the physical world to identify the creator.

There are many claims of supernatural beings, and it might seem an impossible task to sort through them in order to identify the creator. However, the task is not nearly so difficult as it might seem at first. Although there are many claims of supernatural beings, there are very few that claim to have the necessary characteristics of the designer of the universe, and even fewer whose claims are plausible.

Among the few potential candidates for designer, the claim of the God of the Bible stands out as being particularly interesting. Two reasons stand out for considering the Biblical God to be the best candidate for the creator of the universe. First, there are strong claims in the Bible that He is the Creator God. This at least puts Him on the short list, so to speak, since there are very few gods who are claimed to be creator gods. Second, historical records exist to support His existence and supernatural power. The historical records are in the form of a number of written records, some written by the ancient Hebrews, and some written by early Christians. According to these records, God took humanity and lived in Palestine some 2000 years ago. During the time He spent on earth as Jesus Christ, He revealed power over the physical forces and the ability to create in several instances. These include creating wine from water, creating food for several thousand people from a single lunch, restoring the ear of Malchus, calming the storm by fiat, restoring life to dead persons, and many healings by *fiat*. Some of these reported incidents involved creating new matter, while others involved manipulating natural forces in a supernatural way in order to achieve a desired result. The entire story of Jesus took place in a historical setting for which many of the details have been checked and their accuracy confirmed.

In conclusion, the God of the Bible is the strongest candidate for creator of the universe. No other god both makes the claim and has left such convincing historical records to support His existence and power.

Question 4: What are the Roles of Scripture and Science in Understanding Origins?

Science and Scripture are the two major voices claiming to explain origins. Science emphasizes the role of the "laws of nature" acting through secondary processes, while Scripture emphasizes the role of the Creator in both direct and indirect action. At the present time, these two voices present viewpoints that are in conflict.

Most leading scholars deny that direct personal action was necessary in the origins of our world and its life, and affirm that "natural" processes are sufficient to explain our origins. Against this view, most religious people affirm that direct personal action was necessary at one or more points in the origins of life and of humans, and deny that "natural" processes alone are sufficient to explain our origins. Which of these two voices is likely to be more reliable in considering this issue?

What can science tell us about origins?

The term "science" has changed in meaning over the past century or so. Previously, "science" was often used to mean, more or less, "any systematized body of knowledge." Thus, to study a topic "scientifically" meant simply to study it in a systematic way. However, as our culture has become increasingly secular, the meaning of "science" has become secularized. At present, "science" is widely intended to mean a search for physical mechanisms that explain all observed phenomena without reference to direct personal action by a god. Most scientists choose not to consider God's activities in nature when discussing science.

Failure to recognize God's direct action through personal agency in historical events such as origins may be a major cause of misinterpretation of nature. Science has been a highly successful way to gain understanding of observed physical events. However, we may not be justified in extrapolating this success to events we have not observed, especially in historical questions such as origins events. Many phenomena in nature show strong indications of intelligent design, as noted above. Since we do not see life originating repeatedly, nor do we observe new organs originating in existing living organisms, we cannot say that God's activities in origins are restricted to the same set of principles we observe in ordinary "natural" phenomena. The assumption that God is restricted, either voluntarily or not, to "natural" processes in His interactions with nature is one of the more common mistakes in our interpretation of nature.

Modern science can never conclude that an event was actually caused by direct personal action of God. If an event was caused by direct divine action, we will have to look outside of science if we wish to understand it fully.[10] Thus, before we can decide whether to consult science or Scripture regarding origins, we must first determine whether creation was caused by God's direct personal action. Identifying God's actions in nature is an appropriate role for Scripture.

What can Scripture tell us about origins?

The Bible is widely recognized to be a book about God and His activities. The Bible claims that God was and is responsible for the existence of the world and its life. A study of natural phenomena confirms that certain phenomena seem to have no explanation other than God's direct personal activity. Most of these phenomena involve questions of origins. I have mentioned the origin of life and the origin of the human mind. Other examples include the origin of the genetic code, the origin of multicellularity, and the origin of sexuality. As noted previously, there

are sound reasons for believing that God's direct personal action is a necessity in explaining origins. Thus it is appropriate to consult the Bible to learn how God was active in our origins.

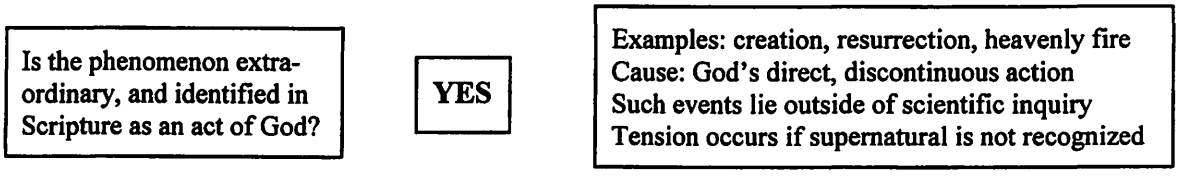
However, caution is needed when interpreting the Bible. One of the common mistakes in our interpretation of Scripture is to assume that the Bible writers used language with the same precision that scholars use today. While the Scriptures claim to be "the word of God," they rarely claim to repeat the exact words of God. Variations in style indicate a variety of authors with personal differences, not a series of stenographers recording God's dictation. Thus it is risky to place too much emphasis on a single word or expression in Scripture. Instead, one should consider all texts dealing with a particular topic, and attempt to determine the sum of their teaching. It may also be useful to evaluate whether a particular point is given significance in the way it is applied in other parts of Scripture. Points that are peripheral in Scripture may be considered peripheral in importance, while those points given prominence in Scripture may be considered essential. A study of Scripture will show that emphasis is given to God's role in origins.

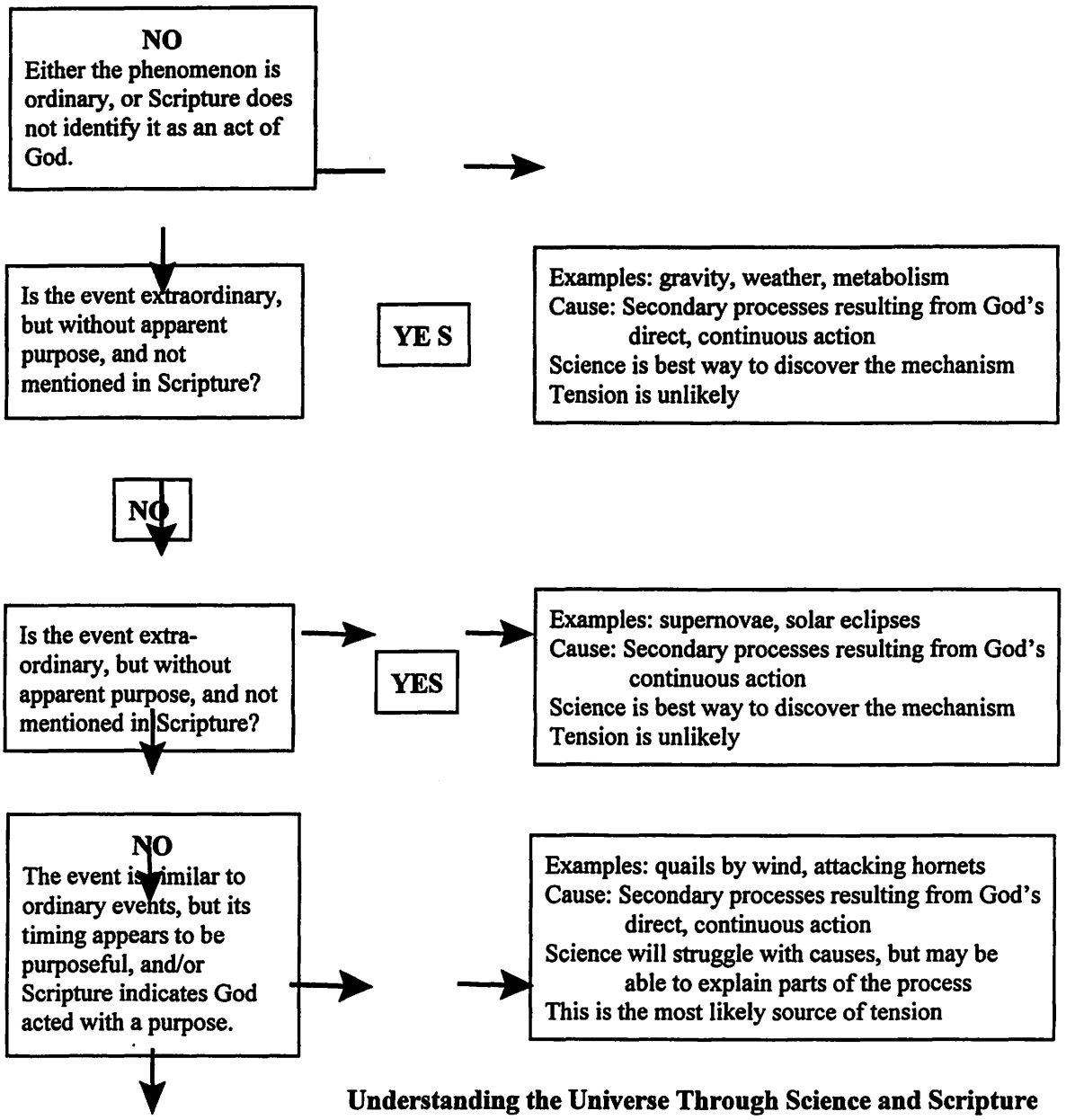
Scholars engaged in discussions of science and Scripture often state that "the Bible is not a science textbook." From this premise, they conclude that the Bible makes no authoritative statement about the creation, and is concerned only with declaring that all things have their origin in the will of God. But this conclusion is based on their own presupposition that the origins of life and humanity can be understood as the result of "natural" secondary processes, and are thus a part of scientific study. We have already seen that there are strong reasons for doubting the presupposition, and therefore for doubting the conclusion. It seems highly likely that our origins involved God's direct action, and that scientific analysis may be inadequate to explain them.

A Proposal for Identifying the Relationship Between Scripture and Science

If the Bible is indeed a book about God's activities, and if God does act directly in the universe, and if science excludes explanations that involve God's direct action, then the Bible should be consulted in order to identify events for which scientific methods may be unsuited, because they involve direct supernatural agency. Science is best suited to seek to identify the secondary processes by which God sustains and governs the creation, and the underlying principles by which God continuously maintains the existence of the universe, and on which the secondary processes depend. These points can be summarized in the flow diagram shown in Figure 1 below.

Figure 1. Flow diagram to illustrate a method to reduce tension between science and Scripture by identifying events for which science may be unsuited because of supernatural action.





Understanding the Universe Through Science and Scripture

Science and Scripture present different perspectives on reality, and they provide the fullest understanding of reality when considered together. Scientific study is based on God's continuous and consistent actions in operating or governing the universe. These actions include God's continuous direct activity, such as causing the universe to exist by maintaining the physical constants and the fundamental forces. They also include God's continuous indirect activity, such as maintenance of life processes, the weather system, and the movements of the stars. Science

has been highly successful in identifying the regularities God uses to govern the universe, and there seems to be no conflict with Scripture over events caused by God's continuous activity.

Scripture is concerned primarily with God's discontinuous actions, without denying the importance of His continuous actions. For example, in the Genesis creation story, God uses direct discontinuous activity. Thus, the creation is a supernatural event. Many other Biblical miracles are included in the category of discontinuous direct actions. There is no need for conflict between science and Scripture in such events, since most scientists recognize supernatural events to extend beyond the reach of scientific inquiry. Failure of scholars to recognize the reality of the supernatural is a major source of conflict between science and Scripture. Resolution of this conflict can come only if it can be shown that there is no supernatural activity in nature, or if scholars recognize the inadequacy of science to deal with supernatural events.

A second source of conflict between science and Scripture involves the process of identifying identify God's discontinuous indirect actions. God may directly initiate a secondary process, causing an event that seems ordinary, but is not. In such cases, the supernatural character of the event may not be recognized, and scholars may reach conclusions that conflict with Scripture, without necessarily denying that supernatural events are possible. The Genesis flood may be an example. The flood seems to have involved many secondary processes that might be studied scientifically. Yet it may have involved a series of direct divine actions, not amenable to scientific analysis. This mixture of discontinuous and continuous divine activity might explain why the flood is one of the most contentious issues involving science and Scripture.

Conclusions

Origins may sometimes be a contentious issue in science and faith because of differing presuppositions about God's relationship to nature. An argument has been presented here that it is eminently reasonable to believe that direct supernatural action was involved in the origins of the universe, life and humanity, and that a scientific process restricted to observable physical mechanisms is inadequate to discover and explain our origins. Certain aspects of reality seem to be best explained by design and direct personal causation. The Biblical description of God presents the most reasonable explanation of the designer of the cosmos and our place in it. No claim is made that the case has been proved, only that it is a reasonable position.

God's activity in nature may be continuous or discontinuous, and directly or through secondary mechanisms. Direct, continuous activity is responsible for the general natural laws that sustain the existence of the universe. Secondary continuous activity occurs as God's direct, continuous activity is channeled through mechanisms designed to maintain physical systems, such as weather, etc. Science is well-equipped to study the physical mechanisms by which God continuously governs the universe, and to identify the general regularities used to sustain the existence of the universe. The general regularities of nature may be understood either as "inherent properties of matter," or as "observed regularities in God's behavior in governing nature." The distinction may not be of concern to the scientist. As long as the causal relationships are consistent, it is possible to develop reliable interpretations. This is why scientists can make

great discoveries of how physical processes operate in nature, regardless of whether the scientist is an agnostic, a pagan, or a devout Christian.

God's discontinuous activity is responsible for what are often called miracles. Scripture is reliable where it indicates events as supernatural. These events are probably opaque to scientific testing, and the best way to learn about them is through divine revelation in the Scriptures.

Again, no claim is made that the case has been proved, and no attempt is intended to legislate boundaries of inquiry. The argument is descriptive, not prescriptive. But if true, the position advanced here might facilitate rapprochement between science and Scripture.

Endnotes

1. Problems in the origin of life are discussed in numerous publications, such as: (a) Thaxton CB, et al. 1984. The Mystery of Life's Origin: Reassessing Current Theories. New York: Philosophical Library; and (b) Spetner LM. 1996. Not by chance! Brooklyn, NY: Judaica Press.

2. See: Dembski WA. 1998. The Design Inference. Cambridge: Cambridge University Press.

3. Behe MJ. 1996. Darwin's Black Box. New York: Free Press.

4. (a) Demski WA. 1998. The Design Inference. Cambridge: Cambridge University Press; and (b) Dembski WA. 1999. Intelligent Design. Downer's Grove, IL: InterVarsity Press.

5. E.g., Van Till HJ. 1999. The fully gifted creation. In: Moreland JP, Reynolds JM, editors. Three Views on Creation and Evolution, p 161-218. Grand Rapids, MI: Zondervan. The distinction between primary and secondary causation can be traced to Thomas Aquinas, Summa Theologica, First Part, Question 19, Article 8 (www.newadvent.org/summa).

6. Claims that a mechanism exists, such as in the power of natural selection, are not based on experimental evidence, but on the presupposition that humans have descended from non-humans through natural means. This is the question that is being asked, and a presupposition is not a satisfactory answer.

7. E.g., see: Hall BG. 1997. On the specificity of adaptive mutations. Genetics 145:39-44.
8. The remarkable fitness of "natural laws" for life has often been noted, e.g.: (a) Denton MJ. 1998. Nature's Destiny. NewYork: Free Press; (b) Penrose R. 1989. The Emperor's New Mind. New York: Oxford University Press, p 340-344; and (c) Ross, H. 1993. The Creator and the Cosmos. Colorado Springs, CO: NavPress., especially chapters 14-15.

9. Hugh Ross criticizes the infinite universes model on page 98 of: Ross H. 1993. The Creator and the Cosmos. Colorado Springs, CO: Navpress. See also page 164ff in Davies P. 1983. God and the New Physics. New York: Simon and Schuster.

10. E.g., Dickerson RE. 1992. The game of science. Journal of Molecular Evolution 34:277.