

1 *An Evolving Creation: Oxymoron or Fruitful Insight?*

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Before discussing how the relationship of “creation” and “evolution” might be best understood, it is useful first to define the terms. In my discussion below, “evolution” refers to the descent with modification of all living things from a common ancestor. That is, the history of life can be envisioned as a branching tree of life in which all living things are linked together in a genealogical relationship that extends back to the first living cells. Understood in this way, the word “evolution” includes any of a number of proposed mechanisms by which evolutionary change occurred. Furthermore, evolutionary theory does not address whether, or how, God might act to guide such processes. “Creation” refers to everything to which God has given being. As a verb, “creation” refers to the past and continuing action of God to bring into existence all that is and has been. A closely related theological concept is that of “providence.” This doctrine includes several distinct aspects: God’s sustaining and upholding of creation; divine cooperation with creaturely action; and the governance of creation toward God’s desired ends.¹ As thus defined, are the concepts of evolution and creation really antithetical as often portrayed? Is the idea of an evolving creation truly an oxymoron, or might it just prove to be a fruitful source of theological reflection?

Much of the public controversy over evolution and creation seems to rest firmly on the widely held view that the conclusions of the historical sciences are in essential conflict with a Christian faith that holds Scripture in high regard. Current scientific and theological descriptions are often seen as being mutually exclusive and contradictory. This conflict model is given legitimacy by persistent misconceptions of the nature and limitations of scientific and theological inquiry perpetuated by the rhetoric of some scientists as well as nonscientists, of some theists as well as nontheists. The task of correcting these misconcep-

1. See Benjamin Wirt Farley, *The Providence of God* (Grand Rapids: Baker, 1988).

tions is made more difficult by the frequent lack of an awareness of the historical context of the current debates.

The conflict or “warfare” view of science and faith entered historical and scientific lore largely on the popularity of two 19th-century works — John William Draper’s *History of the Conflict between Religion and Science* (1874), and Andrew Dickson White’s *A History of the Warfare of Science with Theology in Christendom* (1896).² However, this simplistic warfare metaphor has been thoroughly discredited by both theological and historical scholarship. Christian theologians (including evangelicals) have long recognized that a faithful reading of Scripture does not demand a young Earth nor does it prohibit God’s use of evolutionary mechanisms to accomplish his creative will. Many evangelical Christians at the time of Darwin found no inherent conflict between evolution and Scripture. In fact, several of the authors of the “Fundamentals” (the set of volumes that gave us the term “fundamentalist”) accepted some form of evolutionary theory. Even B. B. Warfield, who argued forcefully for biblical inerrancy, accepted the validity of evolution as a scientific description of origins. The primary advocates of Darwin’s theory in America included Asa Gray, George Frederick Wright, and James Dana — all committed evangelical Christians.³

Evolution has been viewed by many theologically orthodox Christians, since the publication of *The Origin of Species*, as a positive contribution to understanding God’s creative and redemptive work. For many, important theological truths concerning the nature of humanity, the goodness of creation, God’s providence, and the meaning of the cross and suffering find renewed significance and amplification when applied to an evolutionary view of God’s creative work. The integration of an evolutionary understanding of Earth and life history with theological understandings of God’s creative and redemptive activity have yielded important insights.⁴ The fruits of these efforts need to be more widely known and discussed.

2. The historical context of these two influential works is discussed by James R. Moore in *The Post-Darwinian Controversies* (Cambridge: Cambridge University Press, 1979). Moore seeks to dispel the hold of this metaphor on the public consciousness by detailing the responses of a variety of Christian theologians and scientists in the years following the publication of the *Origin*.

3. The Christian evangelical response to Darwin’s ideas is well documented in: David N. Livingstone, *Darwin’s Forgotten Defenders: The Encounter Between Evangelical Theology and Evolutionary Thought* (Grand Rapids: Eerdmans, 1987); and in David N. Livingstone, D. G. Hart, and Mark A. Noll, eds., *Evangelicals and Science in Historical Perspective* (New York: Oxford University Press, 1999).

4. There are several excellent reviews of ways in which science and religious faith can be related: Ian Barbour, *Religion in an Age of Science* (San Francisco: Harper San Francisco, 1990); Alister E. McGrath, *Science & Religion: An Introduction* (Oxford, U.K. and Malden, Mass.: Blackwell, 1999); and Richard H. Bube, *Putting It All Together: Seven Patterns for Relating Science*

Despite the long theological dialogue with evolutionary theory, many people continue to view evolution as inherently antitheistic and inseparably wedded to a worldview that denies God and objective morality. Although this understanding of the meaning of evolutionary theory is widely promoted by individuals both inside and outside of the scientific community, its conflation of a metaphysical naturalism with evolution should be rejected on philosophical, theological, and historical grounds. The equation of evolutionary theory with a philosophy that denies the reality of anything beyond matter and energy not only is false but is an impediment to quality scientific and theological thinking.

Interpreting Scripture and Nature

One consequence of the conflict view is that scientific and theological descriptions are often viewed as mutually exclusive. Complete scientific explanations for natural phenomena are seen as excluding divine action. There is not a large step from this to the perception that science's focus on natural cause-and-effect explanations is a thinly disguised effort to promote a godless worldview.

The perceived tension between scientific description and divine action also derives in part from expectations concerning the purpose and meaning of the scriptural texts. Conflicts are bound to result if Scripture and science are understood to be addressing the same issues in the same sort of way. Appeals to the "plain meaning" of Scripture and an emphasis on personal interpretation divorced from its historical, cultural, and literary context encourage Scripture to be read from a modern Western scientific outlook. However, does this way of reading Scripture do it justice? To answer this question, our hermeneutic — the

and the Christian Faith (Lanham, Md.: University Press of America, 1995). A selection of recent works that integrate an evolving creation with Christian theology are: John Polkinghorne, *Science and Providence: God's Interaction with the World* (Boston: Shambhala, 1989); Jürgen Moltmann, *God in Creation* (Minneapolis: Fortress, 1993); Howard J. Van Till, *The Fourth Day* (Grand Rapids: Eerdmans, 1986); Nancey Murphy, *Reconciling Theology and Science: A Radical Reformation Perspective* (London: Pandora, 1997); George L. Murphy, *The Trademark of God: A Christian Course in Creation, Evolution and Salvation* (Harrisburg, Pa.: Morehouse-Barlow, 1986); Denis Edwards, *The God of Evolution* (New York: Paulist, 1999); John F. Haught, *God After Darwin: A Theology of Evolution* (Boulder, Colo.: Westview, 2000); and Robert J. Russell, William R. Stoeger, and Francisco J. Ayala, eds., *Evolutionary and Molecular Biology: Scientific Perspectives on Divine Action* (Rome: Vatican Observatory and the Center for Theology and the Natural Sciences, 1998). My own personal synthesis is summarized in the article "Theological Implications of an Evolving Creation" which appeared in *Perspectives on Science and Christian Faith* 45 (1993): 150-60.

assumptions we apply in the interpretation of Scripture — must be subject to critical evaluation. It thus becomes imperative that we first evaluate the appropriateness of our hermeneutic before we set out to deal with supposed conflicts.⁵

Just as there is no such thing as an objective reading of the Bible (it must be filtered through some interpretive framework), there is also no such thing as pure inductive Baconian science. Rather, science works by proposing hypotheses, generating predictions by deduction, and then testing those predictions against new observations. The construction of hypotheses takes place within an interpretive framework that includes philosophical and cultural assumptions of which the investigator is often unaware. However, those hypotheses are subject to test and will not become widely held by the scientific community unless their predictions are fruitful.

Theoretical inquiry is the essence of science. By contrast, the public perception is often that science consists primarily of a body of “proven fact.” However, the acceptance of a theory by the majority of the scientific community does not mean that it is “proven.” No scientific theory can be proven in the sense of a logical or mathematical proof. The purpose of theories is to integrate disparate observations of the natural world and make them understandable. They provide the predictions that suggest new observations and drive new discovery. The history of our changing scientific understanding of the universe, with new theories replacing old and previously accepted models being overturned by new discoveries, can be puzzling to those who have learned science as a collection of unchanging “facts.” Furthermore, uncertainty and sharp disagreement within the scientific community are often seen as weaknesses and failings of scientific knowledge. Rather, the exact opposite is the case. It is the dynamic, changing, self-correcting nature of science that is its very strength. The less science is seen as a body of established knowledge, the more inherently interesting and exciting it becomes. Science is not primarily the mastery of a body of knowledge but a way of inquiry about our physical environment.

Many theories may be proposed to explain the same set of observations. However, not all theories are given equal weight by the scientific community. Some are rejected by the preponderance of practicing scientists, and others remain at the fringes provoking critical examination. How do we distinguish a

5. Some good discussions of the hermeneutics of the Genesis texts include: Henri Blocher, *In the Beginning: The Opening Chapters of Genesis* (Downers Grove, Ill.: InterVarsity, 1984); Conrad Hyers, *The Meaning of Creation: Genesis and Modern Science* (Atlanta: John Knox, 1984); John H. Stek, “What Says the Scripture?” in *Portraits of Creation*, ed. Howard J. Van Till et al. (Grand Rapids: Eerdmans, 1990); and Meredith G. Kline, “Space and Time in the Genesis Cosmogony,” *Perspectives on Science and Christian Faith* 48 (1996): 2-15.

good theory from a bad one? How do we establish relative confidence in theories? Criteria for a good scientific theory include: (1) explanatory power; (2) predictive power (testable expectations); (3) fruitfulness (ability to generate new questions and new directions of research); and (4) aesthetics (e.g., beauty, simplicity, symmetry). Many past theories in the historical sciences have been discarded with the accumulation of new observations and the development of new theories of greater explanatory power. The reason evolutionary theory (descent with modification of all living things from a common ancestor) is a powerful theory is that it makes sense of an incredible variety of observations and continues to generate fruitful and testable hypotheses.

Science is a methodology, a limited way of knowing about the natural world. Scientific research proceeds by the search for chains of cause-and-effect and confines itself to the investigation of “natural” entities and forces. This self-limitation is sometimes referred to as “methodological naturalism.” Science restricts itself to proximate causes, and the confirmation or denial of ultimate causes is beyond its capacity. Science does not deny the existence of a creator — it is simply silent on the existence or action of God. The term “methodological naturalism” is intended to communicate that only natural (as opposed to supernatural) causes can in principle be investigated using scientific methodologies. Methodological naturalism describes what empirical inquiry is — it is certainly not a statement of the nature of cosmic reality.⁶ Science pursues truth within very narrow limits. Our most profound questions about the nature of reality (questions of ultimate meaning, purpose, and morality), while they may arise from within science, are theological or philosophical in nature, and their answers lie beyond the reach of science.

While some scientists have tried to use science to promote an atheistic philosophy, such attempts step clearly outside of the realm of scientific inquiry. The scientific enterprise is no more based on a philosophy that denies God than is plumbing or auto mechanics. Science works, it is productive and fruitful, because it is religiously neutral. As a result, scientists representing widely different cultures and religious and nonreligious beliefs can communicate and productively pursue questions about the physical universe. Theological perspectives can provide a context for understanding and integrating scientific understanding with a broader view of reality. However, that synthesis is not itself a scientific conclusion.

Those of us in the scientific disciplines engage in our scientific activity as

6. For a longer discussion of the issue of “methodological naturalism” see my essay “Design and Purpose within an Evolving Creation,” in *Darwinism Defeated?* ed. Phillip E. Johnson, Denis O. Lamoureux, et al. (Vancouver: Regent College, 1999).

whole integrated beings, and our scientific work is inextricably tied into a particular cultural, political, philosophical, and theological context. While distinct, our scientific and theological understandings must inform each other if we are to be intellectually whole persons. They should not be kept in hermetically sealed mental compartments. It is our obligation and calling as Christians to strive to attain an integrated whole picture of reality. However, we are actually better able to integrate different types of knowledge when we maintain clear definitions. When we confuse philosophical naturalism with evolutionary theory, we actually inhibit the productive interaction between the sciences and Christian theology. We do this by injecting into a scientific theory a metaphysical worldview that is simply not a necessary component of the theory.

Important Theological Issues

One commonly held perspective that tends to reinforce a conflict view of science and faith is that God's action or involvement in creation is confined to those events that lack a scientific explanation. Meaningful divine action is equated with breaks in chains of cause-and-effect processes. This view has been called a "God-of-the-gaps" theology. God's creative action is seen only, or primarily, in the gaps of human knowledge where scientific description fails. With this perspective, each advance in scientific understanding results in a corresponding diminution of divine action, and conflict between science and faith is assured. However, this is a totally unnecessary state of affairs. God's creative activity is clearly identified in Scripture as including natural processes. According to Scripture, God is providentially active in all natural processes, and all of creation declares the glory of God. The evidence for God's presence in creation, for the existence of a creator God, is declared to be precisely those everyday "natural events" experienced by us all. Thus Christians should not fear causal natural explanations. Complete scientific descriptions of events or processes should pose no threat to Christian theism. Rather, each new advance in our scientific understanding can be met with excitement and praise at the revelation of God's creative hand.

Another common confusion is over the meaning of "chance" or "random." Chance or random processes are often seen as antithetical to God's action. Many people understand "chance" as implying a purposeless, meaningless, and accidental event. However, scientifically, chance events are simply those whose occurrence cannot be predicted based on initial conditions and known natural laws. Such events are describable by probabilistic equations. This understanding of chance is not in any way in conflict with God's creative

action. The Bible, in fact, describes a God who is sovereign over all natural events, even those we attribute to chance such as the casting of lots or tomorrow's weather. This perspective has been placed into a modern scientific context by some theologians who see God's action exercised through determining the indeterminacies of natural processes. God is thus seen as affecting events both at the quantum level and at the level of large chaotic systems.⁷ Regardless of how one understands the manner in which God exercises sovereignty over natural process, chance events certainly pose no theological barrier to God's action in and through the evolutionary process.

A very common argument against evolution as God's means of actualizing his creative will is the central role of death in the evolutionary process. The theological problem of pain and suffering in nature is an ancient one, but it is given additional significance in an evolutionary context. The apparent conflict between God's goodness and the presence of pain and suffering is made especially acute when we consider the nonhuman creation. How can we accommodate the death and suffering of animals within a theology that declares both God's omnipotence and goodness? This is hardly a new issue. The problem of death, pain, and suffering in the natural world, what has been referred to as "natural evil," has been the focus of much theological and philosophical debate within the Christian church since the 1st century. Developing a theology of "natural evil" requires an understanding of God's immanence in creation as well as God's transcendence, of God's providence as well as sovereignty. It bears on questions of God's purposes for, and participation in, human and natural history.⁸ For many Christians an evolutionary understanding of God's creative activity has provided a useful context within which to approach these ancient theological questions. Efforts toward reconciling the existence of pain and suffering with divine goodness in an evolving creation have encouraged renewed contemplation of the doctrines of providence, incarnation, redemption, and the centrality of the cross.

Other important theological issues are brought into sharp focus by evolutionary theory. The doctrine of the fall and original sin would seem to be challenged by the proposal that humans bear a genetic and physical continuity with the rest of the animal creation. Similarly the meaning of mankind's cre-

7. These ideas have been explored extensively by John Polkinghorne. See also the essay by Robert Russell in this volume.

8. An excellent summary of the history of theological thought on the problem of evil is John Hick, *Evil and the God of Love*, rev. ed. (New York: HarperCollins, 1977). An equally thorough and valuable review of the place of nature in Christian theology is H. Paul Santmire, *The Travail of Nature: The Ambiguous Ecological Promise of Christian Theology* (Philadelphia: Fortress, 1985).

ation in the “image of God” is seen by some as being undermined by the acceptance of human evolution. While these questions have not received the attention their importance requires, particularly within the evangelical theological community, that which has been written provides a valuable foundation for further contemplation.⁹ This work shows that the central Christian doctrines of the universality of human sin and the necessity of the cross are not compromised by an evolutionary view of human origins.

Scientific Issues

In addition to the theological issues relevant to an evolutionary view of God’s creative activity, some have raised questions about the scientific support for evolutionary theory. The scientific issues raised range from questioning the existence of transitional fossil species and critiquing the evolutionary interpretation of genetic data, to claims that complex organ and cellular structures could not arise via evolutionary mechanisms.

In order to address these scientific issues it must first be recognized that biological evolution is part of, and embedded in, the evolution of the cosmos and of our planet Earth. Biological evolution is made possible by the preceding physical and chemical evolution of the cosmos. Furthermore, the evolution of life is both a response to and a cause of the evolving physical environment of the Earth. What we actually see in the geologic record is a concordance between sometimes dramatic changes in the Earth’s oceans, atmosphere, climate, and geography and changes in the Earth’s biosphere from the scale of individual species to entire ecosystems.

There are numerous lines of evidence from a wide range of scientific disciplines that together make a very strong case for the reality of common descent.¹⁰ (1) The sequence of fossil species in the geologic record is consistent on

9. Two examples of recent efforts to consider the nature and fall of humanity within the context of an evolving creation are: Jerry D. Korschmeier, *Evolution & Eden: Balancing Original Sin and Contemporary Science* (New York: Paulist, 1998); and Warren S. Brown, Nancy Murphy, and H. Newton Malony, eds., *Whatever Happened to the Soul? Scientific and Theological Portraits of Human Nature* (Minneapolis: Fortress, 1998).

10. There are many quality resources that summarize the scientific evidence for common descent. An excellent historical review of how our current understanding of the fossil record emerged is presented in Martin J. S. Rudwick, *The Meaning of Fossils* (Chicago: University of Chicago Press, 1985). A detailed but popular historical account of the reconstruction of the human fossil record is Ian Tattersall, *The Fossil Trail* (New York: Oxford University Press, 1995). Robert L. Carroll’s *Patterns and Processes of Vertebrate Evolution* (Cambridge, U.K. and New

a worldwide basis. That is, fossil species follow the same pattern of relative order of appearance. The order of fossil species was determined before the existence of any technique to date the age of rocks. Yet, when those dating methods were developed, they confirmed the order of fossils (and geologic events) already determined. (2) The order of appearance of higher taxa in the geologic record is broadly consistent with the evolutionary sequence inferred from the anatomical data and from DNA. (3) Fossils with transitional anatomical features are common within the fossil record. Such transitional forms commonly possess a mixture of traits considered characteristic of different groups (genera, orders, classes, etc.). They may also possess particular anatomical characters that are themselves in an intermediate state. (4) The geographic distribution of fossil species is consistent with common descent and with independent geological reconstructions of the Earth's changing geography over time. That is, common descent makes sense of the locations in which specific fossil (and living) species are found. (5) The fossil record of changing species over time yields a comprehensive picture of ecological and environmental change. Species changes do not occur randomly but rather are part of the evolution of communities and entire ecosystems. Predators evolve with their prey, parasites evolve with their hosts, herbivores evolve with the plant communities, and so forth. We thus not only can reconstruct the changes in particular lines of descent, but can reconstruct changing ecosystems.¹¹

It is the comprehensiveness and integrated nature of the evidence that becomes overwhelming. There simply is no other way to make sense of this immense body of data than as the record of a very ancient evolving biological and environmental system.

Recently, objections to evolution have appeared which do not attack the

York: Cambridge University Press, 1997) is an up-to-date detailed discussion of both theoretical issues and fossil evidence, and Simon Conway Morris's *The Crucible of Creation* (New York: Oxford University Press, 1998) discusses the "Cambrian explosion." Two recent publications dealing with diverse aspects of the evidence for evolution and designed as teaching resources are: Patricia H. Kelley, Jonathan R. Bryan, and Thor A Hansen, eds., *The Evolution-Creation Controversy II: Perspectives on Science, Religion, and Geological Education*, Paleontological Society Papers, vol. 5 (1999); and Judy Scotchmoor and Dale A. Springer, eds., *Evolution: Investigating the Evidence*, Paleontological Society Special Publication, vol. 9 (1999).

11. Anna K. Behrensmeyer et al., eds., *Terrestrial Ecosystems through Time* (Chicago: University of Chicago Press, 1992) provides an overview of the evolution of entire ecosystems through time and shows the way in which organisms evolve with their physical and biological environments. The ways in which various ecological relationships (predator/prey, plant/herbivore, etc.) have impacted the evolution of individual species and biological communities are discussed in Geerat J. Vermeij, *Evolution and Escalation: An Ecological History of Life* (Princeton: Princeton University Press, 1987).

current reconstructions of the history of life, but rather claim the inadequacy of natural mechanisms to account for them. Some of these critiques make arguments that the origin and subsequent evolution of life are effectively impossible statistically. For example, it has been argued that the probability of a certain specified sequence of amino acids (i.e., a protein) being assembled by chance is impossibly small. This argument, however, assumes that evolution demands that such a protein must have been assembled, without precursors, by chance processes alone. This assumption ignores much of what has been learned about prebiotic chemistry and evolution. The assembly of functional macromolecules is not a pure chance phenomenon but occurs, like biological evolution, within a selective environment. In fact, the process of random mutation and selection has actually been used in the laboratory to synthesize highly functional organic compounds by trial and error.¹²

Another approach is the attempt to empirically recognize “design” within the biological world through the identification of structures of “specified small probability” or with “irreducible complexity.”¹³ This form of argumentation is central to the critiques of evolution made by advocates of “intelligent design” (ID). It is important to realize that the way “design” is used in these arguments is not the same as the theological understanding that creation has a divine purpose and plan — that it was intelligently conceived. Rather, the objective of ID is to identify aspects of the biological world that cannot be accounted for by the action of natural processes. However, these lines of criticism face several significant objections. For example, the appeal to irreducible complexity is an attempt to find criteria that exclude the possibility that a given complex biological structure or system could have been assembled in a series of functional steps. A major error in this approach is the failure to consider how complex biological systems can be built up by the modification and/or duplication of preexisting biochemical or genetic components. A common pattern in the history of life is the co-opting of preexisting biological structures, biomolecules, and DNA sequences to serve new functions. Despite claims to the contrary, plausible, and

12. A. D. Keefe and J. W. Szostak, “Functional Proteins from a Random-Sequence Library,” *Nature* 410 (2001): 715-18. E. H. Eklund, J. W. Szostak, and D. P. Bartel, “Structurally Complex and Highly Active RNA Ligases Derived from Random RNA Sequences,” *Science* 269 (1995): 364-70. G. F. Joyce, “Directed Molecular Evolution,” *Scientific American* 267, no. 6 (1992): 90-97.

13. Two important works by intelligent design advocates are: William A. Dembski, ed., *Mere Creation: Science, Faith & Intelligent Design* (Downers Grove, Ill.: InterVarsity, 1998); and Michael J. Behe, *Darwin’s Black Box: The Biochemical Challenge to Evolution* (New York: Free Press, 1996).

entirely functional, sequential steps have been proposed for a number of highly complex biochemical systems and biological structures.¹⁴

Critics of evolution often discuss design as though God's action is analogous to the work of an engineer or artisan. Such human action involves the imposing of form on preexisting materials. What the engineer or artisan can do is limited by the nature of those materials. By contrast, a divine creator brings into existence the very materials themselves. God creates the substance as well as the form. Perhaps we should expect nature to have been created with the inherent capabilities to bring forth what God desires without violating its integrity.¹⁵ That is, God may act continually within creation by drawing out the creaturely potentialities already present. I believe that such a perspective is much more consistent with the continuity of processes in the physical universe than is an engineering view of God's action. It makes the discovery of each new natural capability, or each new link in the history of creation, an opportunity for the praise of God rather than being perceived as another obstacle to faith or challenge to the doctrine of creation.

The doctrine of creation really says nothing about "How" God creates. It does not provide a basis for a testable theory of the mechanism of change. If it does not address this issue, then it does not contribute anything to a specifically *scientific* description of the history of life. I believe that all of creation is designed by God and has its being in God, but that does not give me any insights into the processes by which God brought that creation into existence. That is the role of scientific investigation, a vocation in which I find great excitement and fulfillment.

Science is still far from having all the answers to how evolution proceeded during the 3.5 billion years during which life has existed on Earth. However, it is these very unanswered questions, and the apparent conflicts and contradictions in our current understanding, that drive new inquiry and discovery. The last decade has seen incredible advances in scientific fields as diverse as biochemistry, genetics, developmental biology, and paleontology. These discoveries and theoretical advances have closed previous gaps in our understanding, overturned past views, and provided promise of new breakthroughs. Some progress is being made even in such long-unresolved and seemingly intractable prob-

14. Kenneth R. Miller (*Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution* [New York: HarperCollins, 1999]) provides extended rebuttals to many of the arguments presented by advocates of intelligent design.

15. This inherent capability of the creation to accomplish God's creative will has been termed "creation's functional integrity" by Howard J. Van Till. This perspective is outlined in Van Till's chapter "The Fully Gifted Creation," in *Three Views on Creation and Evolution*, ed. J. P. Moreland and John Mark Reynolds (Downers Grove, Ill.: InterVarsity, 1999).

lems as the origin of life.¹⁶ It is the continuing success of scientific research to resolve previous questions about the nature and history of the physical universe, and to raise new and more penetrating ones, that drives the work of individual scientists. For the theist this simply affirms that, in creating and preserving the universe, God has endowed it with contingent order and intelligibility, and given us as bearers of the divine image the capability to perceive that order.

Looking Forward

In conclusion, biological evolution is an extremely well-supported and fruitful theory that provides a basis for understanding and synthesizing an amazing range of observations of our natural world. There is no other conceptual framework that has been proposed that provides anything like the explanatory and predictive power of evolutionary theory. The evangelical Christian community must thus pursue the integration of an evolutionary understanding of Earth and life history with theological understandings of God's creative and redemptive activity if we wish to effectively impact our increasingly technological and scientific society. In reality, many Christian scientists and theologians have productively engaged evolutionary ideas since the time of Darwin.

There is a desperate need to diffuse the heated conflict that has grown up around the issue of evolution. The evolution/creation "warfare" view has effectively inhibited productive popular dialogue on important theological issues. Furthermore, it has driven an unnecessary wedge between the Christian and scientific community, and has generated division and personal attack within the body of Christ. It is my sincere hope that this volume will be a significant step toward opening doors through the wall that now separates evolutionary science and Christian faith in the minds of many — a wall constructed diligently by theists as well as nontheists, scientists as well as nonscientists.

16. Recent discoveries have opened up whole new theoretical and research possibilities in approaching the problem of the origin of life. See the following sources for discussions of this ongoing work: C. Ponnampuram and J. Chela-Flores, eds., *Chemical Evolution: Origin of Life* (Hampton, Va.: A. Deepak, 1992); N. G. Holm, ed., *Marine Hydrothermal Systems and the Origin of Life* (Dordrecht: Kluwer Academic, 1992); M. P. Bernstein, S. A. Sanford, and L. J. Allamandola, "Life's Far-Flung Raw Materials," *Scientific American* 281, no. 1 (1999): 42-49. An excellent summary of our current understanding of conditions on Earth during the origin and early evolution of life is E. G. Nisbet and N. H. Sleep, "The Habitat and Nature of Early Life," *Nature* 409 (2001): 1083-91.