

## EVANGELICALS AND MODERN SCIENCE

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*As iron sharpens iron, so one man sharpens another.*

(Prov 27:17 NIV)

A proverb about individuals – but true, I believe, of Christianity and science as well. Each is a challenge to the other, for better or worse. We evangelicals who train pastors, lead congregations, teach, or do scientific research can help make these challenges work for the betterment of science and Christianity. To see how this is so, let us consider some of the things going on in modern science.

### What's Happening in Science

Many do not classify **mathematics** as a science, since it studies ideas inside us rather than objects out in nature. Yet there is a strange correlation between mind and universe, between math and science. As Einstein once noted: "The most incomprehensible thing about the universe is that it is so comprehensible."<sup>1</sup>

Strange things have been happening within mathematics, too. The assured results of Euclid's geometry, which stood for over 2000 years, were challenged in the last century. Not, indeed, by claims that Euclid was mistaken; rather that his parallel lines axiom was not the only possibility.<sup>2</sup> Other alternatives, when developed, gave geometries of curved spaces. These turn out to have numerous applications to the real world. So do geometries of many dimensions – whether or not our universe has three, four, eleven or more dimensions itself.<sup>3</sup> Perhaps the universe is a kind of exhibition hall, where God has used all sorts of mathematics somewhere in its construction.

In this century, Kurt Gödel proved that logical systems such as arithmetic are incomplete, astounding mathematicians and philosophers alike.<sup>4</sup> If such a system is logically consistent, then it is not fully demonstrable. If it is demonstrable, it cannot be proved consistent. This may be fatal to deductivist hopes that our universe itself is one great self-consistent logical system, with all its features derivable from first principles.

With the advent of computers, mathematics has become more and more experimental (mathematicians would prefer to say "numerical" or "applied"). Not that logical proof has been replaced by trial and error, but electronic calculations allow us to go far beyond anything feasible by hand. And with today's video technology, computers can display objects of higher-dimensional geometry that far surpass the visualizing ability of our brains.<sup>5</sup> Thus, computers have become an exploratory tool to suggest what theorems may be worth trying to prove. Mathematics, like the sciences, is turning out to be a vast ocean, and we are just getting into its depths.

A century ago, many thought **physics** pretty well complete. The only work left was to determine more decimal places for its basic constants. But the search for these decimals soon shattered this opinion with discoveries leading to relativity and quantum mechanics.

Einstein's theories of relativity, strange as they may be, have been impressively verified.<sup>6</sup> His special theory has an absolute "speed limit" in the universe, approaching which an object's mass increases to infinity, its length goes to zero, and its time comes to a standstill. Measurements of time and space are relative, varying with the motion of the one making the observations.<sup>7</sup> His general theory of relativity restores absolute time to the universe, but locally time and space are distorted by gravitational fields. In extreme cases, parts of the universe may nearly pinch off from the rest and become "black holes."<sup>8</sup>

Relativity does not extrapolate into ethics, however. The attempt to justify moral relativity from physics is unwarranted. We could equally well argue that an absolute speed limit in the universe implies moral absolutes. Opposition to modern physics by evangelicals for this reason is certainly ill-advised.

Quantum mechanics has been more troubling. It has often been represented as replacing determinism with chance as the basic reality, which certainly disagrees with the biblical worldview. But there are actually several competing interpretations of quantum phenomena,<sup>9</sup> and we need not opt for a random, acausal universe.

Nevertheless, the phenomena of quantum mechanics are real, and (like relativity) they often seem to mock at common sense. The more accurately we pin down the location of an electron (say), the less definite its motion is. The better we know its motion, the less we know about where it is. In some observations, electrons behave like particles; in others, like waves. What are they, really? The famous double-slit experiment shows that we are not just talking about groups of particles which collectively behave like waves. An individual particle which passes through one slit apparently "knows" whether the other slit is open or closed!<sup>10</sup> And when two particles, originally together, move miles apart, one of them somehow "knows" the result of a measurement on the other instantaneously, even though a signal from one to the other cannot travel faster than the speed of light!<sup>11</sup> This last feature, however – assuming it stands up under further testing – would seem more of a problem for a mechanistic universe of local interactions than for one controlled by a God who is everywhere present.

Physicists continue to seek one unifying force behind the four basic forces currently known – gravity, electromagnetism, the strong and weak nuclear interactions. In view of Maxwell's earlier success combining electricity and magnetism, and the recent work of Glashow, Weinberg and Salaam uniting these with the weak interaction, many hope to succeed where Einstein failed.<sup>12</sup> Evangelicals may feel threatened by research of this sort, since we believe God is the unifier of the cosmos. But in fact God has not told us whether he has reserved all unification to himself (so that such searches will prove futile) or whether he has mediated some unity through a created force.

Among the branches of **astronomy**, cosmology is especially interesting to evangelicals. Is the cosmos "all that is, or ever was, or ever will be,"<sup>13</sup> or is it just a part of what exists, and only one act in a greater drama produced and directed by the Creator?

During the so-called Enlightenment, many abandoned the biblical cosmology of an absolute beginning, but in recent years observation and theory have moved back in this direction. The static, eternal universe favored by nineteenth century atheism was replaced in this century by various dynamic models when it became apparent that the stars were running down and the universe expanding.<sup>14</sup> Then the discoveries of the three-degree blackbody radiation and quasars revealed that our universe was hotter and more crowded earlier than it is now, and most investigators abandoned the steady-state cosmology for some form of the big-bang theory.<sup>15</sup> Currently it looks like our universe began absolutely at the big-bang, in contrast to the formerly popular oscillating versions.<sup>16</sup> The main alternative, that the universe is just a three-dimensional bubble in an infinite, eternal universe of unbelievably high temperature and density,<sup>17</sup> has little evidence for it compared with biblical theism.

If the universe began at the big bang, did it just happen or was it created? Evidence that looks like design in the universe has recently been found in the "fine-tuning" which exists between its basic forces. If these forces differed ever so slightly from what they are, life of any chemical sort could not exist. The non-theistic models proposed to explain this seem rather far-fetched.<sup>18</sup>

In **chemistry** (aside from pressing environmental concerns), the main interest for evangelicals has been the chemistry of life. The classic experiment of Miller and Urey in 1952 showed that amino acids could be produced in an atmosphere devoid of oxygen, which seemed reasonable for the early earth. The optimism this generated for life arising spontaneously has since been dampened. There is growing evidence that the early atmosphere contained too much oxygen. Miller-Urey type experiments after 35 years still cannot produce the full set of amino acids found in life. Competing reactions would destroy intermediate molecules needed for synthesis of DNA, RNA and proteins. The simplest system which will reproduce itself is apparently far too complex to form by random processes (without the intervention of an intelligent being) even in a universe as large and old as ours is.<sup>19</sup>

In the past two centuries **geology** has moved from viewing the earth as only a few thousand years to several billion years old. This shift began well before Darwin made evolution scientifically respectable. It was initially based on the discovery of miles-thick geologic formations, which seemed impossible to produce in just a few thousand years, even with the help of Noah's flood.<sup>20</sup> Though opposed by Kelvin because he calculated that the sun could not be so old, his objections were later overcome by the discovery of radioactivity, which led to both a mechanism for a long-lived sun and a technique for dating geologic formations.<sup>21</sup>

Since then, theologians have split over whether the Bible allows for an old earth or not. Among those who think not, some have rejected the idea that the Bible teaches anything scientific, others have rejected geologic dating.<sup>22</sup> Those who feel the Bible allows an old earth have sought to harmonize the biblical and geological data.<sup>23</sup>

Taking the geologic strata as trustworthy records of an old earth, the fossils reveal an early earth devoid of life. Later on, simple life appears, which remains alone for many millions of years. Then comes the "Cambrian explosion" in which nearly all the animal phyla appear rather suddenly. Later comes the successive appearance of fish, amphibians, reptiles, birds, mammals, and last of all, man.<sup>24</sup> This fossil succession is understood by evolutionists as the natural development of life from simple beginnings. Old-earth creationists see it as evidence for God's successive intervention to create new life forms as the environment is prepared to support each in turn. Young-earth creationists reject the idea that the geologic column is a historical sequence. Instead, the fossil succession is seen as a result of ecological zoning and the differing ability of various animals to escape the waters of Noah's flood, though both these ideas face severe problems.<sup>25</sup>

The fossils also revealed that plants and animals differed from one region of the earth to another. Darwin's study of such differences among living finches and turtles on the various Galapagos Islands led him to propose his theory of evolution. Such differences also raised questions regarding a universal flood. Did God bring polar bears from the arctic, penguins from the antarctic, kangaroos from Australia and sloths from South America to the ark before the flood (since they appear in the fossil record in these places) and get them back afterward (since they are there now)? Clearly God *could have* miraculously transported them, but nothing like this is mentioned in Genesis. Young-earth creationists have sometimes tried to solve this by postulating a (problematic) rapid continental drift after the flood. Old-earth creationists and theistic evolutionists have often opted for a local or regional flood so that transportation from outside the flood zone would be unnecessary.<sup>26</sup>

**Biology** has been dominated by an evolutionary paradigm since Darwin's time. There have been ups and downs in its acceptance, and modifications such as the new synthesis and punctuated equilibrium model. Yet some have always rejected it for scientific rather than theological reasons.<sup>27</sup> Among scientific objections, geological investigation has continued to sharpen the gaps between major biological categories in the fossil record rather than making them disappear.<sup>28</sup> Attempts to model mutation and natural selection mathematically have not produced increasing organization.<sup>29</sup> Many biological systems do not look like they can be reached from simpler systems by a sequence of favorable, single mutations.<sup>30</sup> Complex organs like the eye would not form by random mutation in the time available, even though evolutionists assume sight developed several times in the history of life.<sup>31</sup> Nevertheless, the sequence of life-forms in the fossil record, plus a preference in the scientific community (following Hume) for any natural explanation over any supernatural one, means that science will not likely abandon evolution any time soon.<sup>32</sup>

With the rise of microbiology, evidence for the complexity of living things has risen dramatically,<sup>33</sup> putting even more pressure on the claim that life developed by unguided processes. At the same time, similarities of biochemicals across species boundaries have strengthened many in their conviction that all life developed from a single original lifeform.<sup>34</sup>

Before Darwin, arguments for a Designer from organization in living things was a major apologetic for Christianity. But evolution, many feel, destroyed this approach.<sup>35</sup> In recent years, though, the argument has been revived as the complexity of organs and biochemical systems has become more obvious.<sup>36</sup> Mutation and natural selection do not seem to be able to produce such order, yet our own experience shows us that a mind can do so.

**Anthropology** has often held center stage in the creation-evolution controversy, doubtless because of the clash between definite statements on human origins from Genesis two and various anthropologists. Interpreters of both nature and Scripture have frequently aggravated the situation by unfounded claims,<sup>37</sup> yet a number of troubling facts remain. Numerous fossils seem to be anatomically intermediate between human and ape.<sup>38</sup> The biochemistry of modern man is closer to that of the apes than to the other animals, and (in some cases) is virtually the same for chimp and man.<sup>39</sup> On the other hand, the mental difference between man and ape is vast, even though apes are apparently the most "intelligent" of non-human animals.<sup>40</sup> Can unguided evolution really explain the origin of the human mind, or even the origin of animal brains?

With this brief summary, we see that modern science has made a number of discoveries which challenge evangelicals. It has also made others which challenge the "methodological atheism" of the scientific community.

### **Evangelical Responses to Modern Science**

Bible believers have reacted to these challenges in various ways. Three broad approaches have developed to questions regarding the age of the earth and evolution: young-earth creation, old-earth creation, and theistic evolution. Each of these includes some diversity, but can be roughly described as follows.

**Young-earth creationists** believe the universe, earth and mankind were created just a few thousand years ago. Living things were created more or less instantaneously and have changed very little since then. Scientists are thus fundamentally wrong in believing in an old earth or in evolution. The Genesis account is our basic source of information on origins, and all scientific data are to be interpreted in agreement with the simplest reading of Scripture. Typically, Noah's flood is seen as the source of most geologic strata.<sup>41</sup> A few young-earth creationists reject quantum mechanics and relativity.<sup>42</sup> Some of these even reject a sun-centered solar system, claiming science went astray in the sixteenth century with Copernicus.<sup>43</sup>

**Old-earth creationists** accept a universe and earth some billions of years old, believing that scientists are properly interpreting substantial evidence here.<sup>44</sup> They also believe that mutation and natural selection account for small-scale changes (microevolution) in plant and animal life, allowing organisms to adapt in a limited way to changes in climate and environment, but producing no new organs or systems.<sup>45</sup> They part company with evolutionists by noting that the fossil record gives no evidence of gradual transitions between

the larger divisions of the biological classification, thus rejecting macroevolution. They interpret the Genesis account and scientific data so as to harmonize, often taking the days of Genesis to be long periods of time.<sup>46</sup> Some hold to a geographically universal flood, others to a regional flood. Mankind is seen as a special creation of God, some seeing our creation hundreds of thousands of years back, others making it much more recent.<sup>47</sup>

**Theistic evolutionists** accept the main lines of modern scientific thought on origins, but reject any non-theistic implications.<sup>48</sup> All life is typically viewed as developing from one initial life form, perhaps created by God's intervention, perhaps by his providential guidance.<sup>49</sup> The development of various forms from this original life was also providentially guided. There is some divergence on human origins. Most commonly, a whole population of apes is thought to have evolved into humanity, with no original pair having ever existed.<sup>50</sup> Some, however, believe God breathed into an ape to provide him with a soul, thus producing Adam, the first man. From his side comes Eve, as Genesis 2 says. In this scheme, there was an original pair, and mankind's fall into sin was a specific historical event.<sup>51</sup>

Unfortunately, then, evangelicals have not found as much common ground as we would like for a unified response to modern science. Yet all can agree that God is Creator, that unguided evolution will not work, that man has a special place of responsibility over God's creation, that the universe really doesn't make sense without God, and that it is crucial for people to recognize this. These are basic and central matters which should not be overlooked in the midst of our intramural disputes.

However, there is no agreement on a detailed alternative model to unguided evolution. Young-earth and old-earth creationists agree that macroevolution is mistaken, and are often united on what its problems are. Old-earth creationists and theistic evolutionists agree that the earth is old, and generally see similar problems with young-earth creationism. Young-earth creationists and many theistic evolutionists agree that the Bible taken literally does not fit with the modern scientific consensus and generally feel that harmonization is not the right strategy.

We should not be surprised to find such disagreement. After all, evangelicals are not united in a number of areas of biblical interpretation -- baptism, church government, eschatology, miraculous gifts today -- so why should we expect better agreement when it comes to the interpretation and harmonization of Bible and science? Yet in spite of this we should not give up but should continue to seek solutions in all these areas. In what follows, I give some suggestions as an old-earth creationist for making progress in relating Bible and science.

### **Science as Exegesis**

We are discussing what is commonly called the relation of "Bible and science." In spite of popular use, this pairing of terms is not ideal. Science is basically a method; the Bible basically data. The pair "science and religion" is even worse; religion is such a generic

term that almost nothing can be said that is true of all religions. For instance, is atheism a religion? Some better pairs are "Bible and nature" (both data), "theoretical science and theology" (both theorizing from the data), "experimental science and exegesis" (both observing and trying to understand the data). Perhaps religion – like engineering – is application. In any case, consider the parallels between science and exegesis, which seem to be especially fruitful.

From a biblical perspective, it makes sense to view science as the interpretation of God's general (or natural) revelation, just as exegesis is the interpretation of God's special revelation in the Bible. For an evangelical, both nature and Scripture are inerrant sources of information from God. Both have fallible human interpreters. Exegetes (ideally) study the Bible to see what is there, rather than to defend their own theology or denominational tradition. Scientists (also ideally) study nature to see what is there, rather than to defend their own pet theories or the *status quo* in their field. Both disciplines favor a priority of data over theory. Both use beauty, simplicity, cogency, and correspondence with established theories as aids to their own theorizing.

Of course, there are differences. As evangelicals we believe that we have all of the Bible now – a written text of finite length – though we would not claim it contains all there is to know about our infinite God. Nature, on the other hand, though presumably finite, is continually opening up new pages of its text to our view as we build new devices which look further or probe deeper. In addition, the Bible is already given in human languages; nature is not.

If we as evangelicals feel warranted in harmonizing biblical passages which we believe refer to the same historical event, should we not also harmonize the data of nature and Scripture on the origins of the universe, life and ourselves? If we accept Matthew's account that there were two demoniacs whose deliverance caused a herd of pigs to stampede into the Sea of Galilee, though Mark and Luke mention only one demoniac; if we accept Matthew's account of the flight of Mary, Joseph and Jesus into Egypt, though nothing is said about this in Luke; then we should not be surprised that nature may give us information about which Scripture is silent and vice versa.

Many scientists, of course, don't think they are exegeting God's revelation in nature when they do science, but that doesn't mean they aren't. After all, many liberal theologians don't think they are exegeting God's revelation when they interpret the Bible; but if biblical Christianity is true, that is what they are doing all the same. Surely any activity which ignores God is going to be defective in important ways. If science as practiced by secularists has no concern for the universe as a natural revelation, it is up to us as evangelicals trained in science to try to fill this gap.

## The Relative Merits of Various Evangelical Options

The three options listed earlier as evangelical responses to modern science seem to differ substantially in how they handle data from nature and Scripture. Young-earth creationists try to construct the simplest model of origins possible using only the biblical data. The scientific data are then interpreted to conform with this model, whether or not this is a straightforward way to understand them. The idea of creation with apparent age is frequently employed to handle difficulties.

At the other end of the spectrum, theistic evolutionists construct the simplest model of origins from the scientific data, and then interpret the biblical material to conform. For evangelicals this may result in reading Genesis two and three as parabolic or allegorical, and in denying that Genesis one was intended to answer any scientific questions about how God worked.

Old-earth creationists, by contrast, use the data from both nature and Scripture in devising their original models, seeking a construct that does justice to both. Naturally, these models will be more complex than the minimum necessary to fit either set of data alone, but this does not mean we should force a harmonization.

Some evangelicals have noted that science often functions differently in dealing with present-day phenomena than it does when investigating origins. Geisler has distinguished between "origins-science" and "operations-science."<sup>52</sup> From a different perspective, Van Till has suggested a distinction between "formative history," those features of origins which science can investigate, and "ultimate origins," those which transcend science.<sup>53</sup> Both of these suggestions have some merit. Apparently two factors are at work. One is our closeness to the data; the other is the question of immanence vs. transcendence, or providence vs. miracle.

The extent to which we have a "hands on" relation with particular scientific data forms a continuum. Some phenomena are accessible to the laboratory and repeatable almost at will. Other phenomena cannot be brought into the laboratory. Of these latter, some are beyond our control but repeat at frequent intervals (e.g., periodic phenomena on the sun). Other phenomena repeat at rare intervals beyond our life span (e.g., the life cycle of a star). Some phenomena occur only once in the history of our universe (e.g., the big-bang). Clearly, the reliability of our theorizing decreases as the phenomena are less under our control and less frequently repeated.<sup>54</sup>

God's activity in our world has traditionally been divided into providence and miracle. Evangelicals agree that both occur, though Howard Van Till would apparently like to limit miracle to redemption.<sup>55</sup> Evangelicals disagree on the amount and location of miracle involved – young-earth creationists postulating the most intervention and theistic evolutionists the least.

Theistic evolutionists have sometimes charged young-earth and old-earth creationists with appealing to a "God of the gaps" in postulating divine intervention at one point or another in creation.<sup>56</sup> Granted. Creationists, however, have usually appealed to gaps in the fossil record or in scientific mechanisms as warrant for such suggestions. We should remember, however, that evolutionists, theistic or not, also employ a "god of the gaps" – natural law – which is plugged in even when there seems to be real discontinuity in fossil record or mechanism!

Lastly, a complaint against both young-earth creationists and theistic evolutionists: both resort to fictitious history in their treatment of origins. Young-earth creationists admit using "appearance of age" to explain scientific phenomena which otherwise suggest an old earth or universe. But since the light from stars, galaxies and quasars tells us something of what was happening on those objects when the light left them, so light from objects more than a few thousand light years away must be, in their view, telling us what would have been happening there if the objects had existed then (which they didn't) – fictitious history. Those theistic evolutionists who deny a real Adam interpret Genesis two and three as parabolic or allegorical – the accounts look historical but they aren't. Again, fictitious history. One sees fictitious history in nature, the other in Scripture. It would be much better, if possible, to handle the data without invoking the concept of fictitious history.

This is not to say that the old-earth creation viewpoint has solved all the problems of relating biblical and scientific data. Further investigation and reflection are certainly needed in this area, and input from young-earth creationists and theistic evolutionists should continue to be helpful.

## **Conclusions**

Evangelicals have been challenged in numerous areas by science. We should not fear that real discoveries will overthrow biblical Christianity, nor should we treat science as an enemy. Instead we should realize that science is in the process of studying general revelation. God will continue to reveal himself to scientists as long as they do not overextend their methodology so as to rule out God or refuse to consider the possibility that he has intervened miraculously into nature.

We as evangelicals need to continue working on harmonizing God's revelation in his Word and his world. We should not be satisfied with superficial answers or forced exegesis. We should remember that at any given time, we may not have sufficient information to solve a particular problem or construct a proper harmonization. Therefore, we must carefully scrutinize each new page of general revelation as it comes to light and consider how it may influence our proposed syntheses.

Modern science has also been challenged in numerous areas, not so much by evangelicals as by our God in his general revelation. We as evangelicals need to cooperate with God in helping non-believing scientists (and others) to see these things and to turn to

Jesus as their redeemer. We need to be cautious yet faithful in our handling of scientific data, lest we put unnecessary stumbling blocks before others that would hinder their coming to God.<sup>57</sup>

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34. Richard Dawkins, *The Blind Watchmaker* (New York: Norton, 1986), ch 10; Pamela K. Mulligan, "Proteins, Evolution of," *McGraw-Hill Encyclopedia of Science and Technology* (1987), 14:412-17.; Emilie Zuckerandl, "The Evolution of Haemoglobin," *Scientific American* 213 (1965), 1012-20; Francisco J. Alaya, ed. *Molecular Evolution* (Sunderland, MA: Sinauer, 1976). See Denton, *Theory in Crisis*, ch 12 for a typological perspective.

35. Bertrand Russell, *Why I Am Not a Christian* (New York: Simon and Schuster, 1957), 9-10; Dawkins, *Blind Watchmaker*, ch 1; Barrow and Tipler, *Anthropic Cosmological Principle*, 83-87.

36. Denton, *Theory in Crisis*, 26-29, 214-27; Hayward, *Creation and Evolution*, ch 4; Robert Gange, *Origins and Destiny* (Waco, TX: Word, 1986), 33-40, 105-09.

37. Pitman, *Adam and Evolution*, 91-94; Roger Lewin, *Bones of Contention* (New York: Simon and Schuster, 1987), 54-55, 60-75; Glen J. Kuban, "The Taylor Site 'Man Tracks,'" *Origins Research* 9:1 (1986), 1; Committee for Integrity in Science Education, *Teaching Science in a Climate of Controversy* (Ipswich, MA: American Scientific Affiliation, 1986), 18-21.

38. W. E. LeGros Clark, *Antecedents of Man* (New York: Harper and Row, 1963); Henri Blocher, *In the Beginning* (Downers Grove, IL: InterVarsity, 1984), 229-30; but see also John Wiester, *The Genesis Connection* (Nashville: Nelson, 1983), 158-90.

39. Eldon J. Gardner, *Principles of Genetics*, 4th ed. (New York: Wiley, 1972), 305-08. But blood transfusions and organ transplants have not worked well.

40. Pitman, *Adam and Evolution*, 240-46; Gange, *Origins and Destiny*, 104, 121-36.

41. Morris and Whitcomb, *Genesis Flood*; Whitcomb, *Early Earth*.

42. Thomas G. Barnes, *Physics of the Future* (El Cajon, CA: Institute for Creation Research, 1983). See also articles by Barnes, Akridge, Slusher and Bouw in the *Creation Research Society Quarterly*.

43. W. van der Kamp, "The Heart of the Matter" (Burnaby, BC: the author, 1967). See also the *Bulletin of the Tychonian Society*, 4527 Wetzel Ave., Cleveland, OH 44109.

44. Davis A. Young, *Creation and the Flood* (Grand Rapids: Baker, 1977); Young, *Christianity and the Age of the Earth*; Daniel E. Wonderly, *God's Time Records in Ancient Sediments* (Flint, MI: Crystal Press, 1977); Wonderly, *Neglect of Geologic Data*; Newman and Eckelmann, *Genesis One*; Hayward, *Creation and Evolution*, chs 5-9.

45. Except as could plausibly have arisen from random mutations. See, e.g., Pun, *Evolution*, 191-230.

46. *Ibid.*, 251-71; Newman and Eckelmann, *Genesis One*, 67-88.

47. Wiester, *Genesis Connection*, 187-90; Robert Brow, "The Late-Date Genesis Man," *Christianity Today* 16 (1972), 1128-1129; William J. Kornfield, "The Early-Date Genesis Man," *Christianity Today*, 17 (1973), 931-34.

48. F. Donald Eckelmann, "Geology," in *The Encounter Between Christianity and Science*, ed. Richard H. Bube (Grand Rapids: Eerdmans, 1968), 135-70; Walter R. Hearn, "Biological Science," in *Ibid.*, 199-223; Howard J. Van Till, *The Fourth Day* (Grand Rapids: Eerdmans, 1986), 188, 227-31, 264-65.

49. Richard H. Bube, "Creation (B): Understanding Creation and Evolution," *Journal of the American Scientific Affiliation* 32 (1980), 177.

50. Richard H. Bube, "Biblical Evolutionism?" *Journal of the American Scientific Affiliation* 23 (1971), 140-44.

51. David L. Dye, *Faith and the Physical World* (Grand Rapids: Eerdmans, 1966), 136-50; James M. Houston, "The Origin of Man," *Journal of the American Scientific Affiliation* 34 (1982), 1-5.

52. Norman L. Geisler and J. Kerby Anderson, *Origins Science* (Grand Rapids: Baker, 1987).

53. Van Till et al, *Science Held Hostage*, 15-25.

54. Fortunately, marks of frequently repeated phenomena indicating an old earth are abundant in the earth's crust. Large areas of North America are covered by fossil-bearing sedimentary sequences, often with a thickness of several miles. Many of the layer units in these sedimentary columns are rock-types which cannot form rapidly, but require thousands of years to make even 50 feet of thickness. A large percentage of limestones and shales fall into this category. Limestone layers deep in U.S. and Canadian oil fields sometimes include large surfaces showing extensive erosion features, even potholes and steep-walled canyons, which indicate the surface had hardened into rock *before* additional thousands of feet of rock were formed on top of them. These buried surfaces often include fossil sea-shells, which were first securely cemented into the rock surface and then partially worn off by erosion before their final burial took place. Other limestone deposits frequently contain organically formed structures, such as algal mats and coral reefs, which still show the growth patterns of the organisms which produced them, usually with recognizable fossils of these organisms, some in their normal growth positions, others moved downslope by wave action or sediment flow before final burial took place. See Wonderly, *Neglect of Geologic Data* for abundant documentation of this.

55. Van Till, *Fourth Day*, 224-27.

56. Richard H. Bube, "The Failure of the God-of-the-Gaps," in *Horizons of Science*, ed. Carl F. H. Henry (New York: Harper and Row, 1978), 21-35.

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