

*Man: A Theology of the Sabbath and Second Advent.*

64. SPECTRUM, vol. 9, no. 1. This special issue also contains a selected bibliography on the theology of the Sabbath compiled by Sakae Kubo and Fritz Guy.

65. Fritz Guy, "The Presence of Ultimacy," SPECTRUM, vol. 9, no. 1, pp. 48-54.

66. Gerald Winslow, "Moment of Eternity," SPECTRUM, vol. 9, no. 1, pp. 55-60.

67. Sakae Kubo, "The Experience of Liberation," SPECTRUM, vol. 9, no. 1, pp. 9-14; Samuele Bacchiocchi, "A Memorial of Redemption," SPECTRUM, vol. 9, no. 1, pp. 15-20.

68. Roy Branson, "A Festival of Fellowship," SPECTRUM, vol. 9, no. 1, pp. 37-42; Niels-Erik Andreasen, "Jubilee of Freedom and Equality," SPECTRUM, vol. 9, no. 1, pp. 43-47.

69. Otilie Stafford, "These Bright Ends of Time," SPECTRUM, vol. 9, no. 1, pp. 21-24.

70. Herold D. Weiss, "The Theological Task," SPECTRUM, vol. 4, no. 1 (Autumn 1969), pp. 13-22. William G. Johnsson, "Needed—Constructive Adventist Theology," SPECTRUM, vol. 6, nos. 3/4 (1974), pp. 71-77.

71. Ron Walden, "Edward Vick's Passion for Theol-

ogy," SPECTRUM, vol. 8, no. 3; James J. Londis, "Jean Zurcher, Philosopher of Man," SPECTRUM, vol. 9, no. 2 (March 1978), pp. 38-44.

72. Charles Scriven, "The Case for Renewal in Adventist Theology," SPECTRUM, vol. 8, no. 1 (September 1976), p. 4.

73. E. Edward Zinke, "The Conservative Approach to Theology," *Ministry* (October 1977), pp. 24a-24p.

74. Jack W. Provonsha, *God Is With Us* (Washington, D.C.: Review and Herald Publishing Association, 1974).

75. Charles Scriven, *The Demons Have Had It: A Theological ABC* (Nashville: Southern Publishing Association, 1976).

76. SPECTRUM, vol. 9, no. 3, devoted a special section to Paxton's book, entitled "The Shaking of Adventism?" It included the following articles: Fritz Guy, "A View from the Outside"; Herbert Douglass, "Paxton's Misunderstanding of Adventism"; Desmond Ford, "The Truth of Paxton's Thesis"; Hans LaRondelle, "Paxton and the Reformers"; and Jonathan Butler, "An Interview with Paxton."

77. Carl F. H. Henry, *God, Revelation, and Authority*, vols. 1-4 (Waco, Texas: Word Books, Publisher, 1976-79).

# Tensions Between Religion and Science

by Molleurus Couperus

Are scientific and religious views of reality complementary or conflicting? Can one accept the Bible as divine revelation and also accept the validity of scientific theories regarding origins? Can a competent and honest scientist also be a committed and sincere Seventh-day Adventist? Attempting to answer such questions led to a decade of tension and struggle for Adventist intellectuals and church administrators.

Two General Conference institutions were directly immersed in issues of science and theology: the Geoscience Research Institute (GRI) and Biblical Research Institute (BRI). During the seventies, both were pushed into apologetic roles that saw them promote

strongly conservative, if not fundamentalist, attitudes toward the nature and authority of science and Scripture.

Those who resisted change in the relation of science and religion feared especially that the findings of science would weaken the authority of Ellen White. In order to protect the Bible and Ellen White from the theories of modern science, they questioned the authority of science as an independent avenue to truth. In general, efforts to practice "true science" as a search for substantiation of long-treasured beliefs and authorities characterized church-sponsored publications.

But at the same time, the church's continued commitment to higher education produced a whole new generation of Adventist scholars with advanced degrees and personal commitments to the open and critical methods of scholarship. Godfrey Anderson (1969) expressed the viewpoint of these scholars:

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A scholar cannot devote his efforts to proving a pet viewpoint — no matter how enamored of it he has become — while ignoring or discarding all evidence that does not fit his theories and accepting all those things that prove his point. Rather, as objectively as he can, as a finite human being, he must evaluate all the material that his search unearths. If a long-treasured theory fades under the glaring light of truth, this is a hazard and a sadness of the search for truth.<sup>1</sup>

Reflecting this basic assumption, Cottrell (1966–67) discussed the relation of reason and faith in a series of 11 articles published in the *Review and Herald*. The shading of his emphasis was quite different.

The Bible. . . was not given to acquaint us with such things as the facts of secular history or the natural world, except to the extent that these subordinate facts are essential to its primary purpose.

Furthermore, this revelation was not intended to be a substitute for man's natural faculties. . . . The Bible was never intended for use as a textbook on such subjects as history, botany, zoology, geology, or astronomy.<sup>2</sup>

Ritland (1970) observed that the self-correcting nature of science with its willingness to allow its theories to be challenged by investigators was a source of its extraordinary strength and resilience. He counseled: . . . those who search for clues regarding basic questions — the origins of our world order, the meaning of existence — must [also] remain open to truth from any source. . . . Those who fail to do this may be unable to make certain breakthroughs, may be self-limited to discern shades of meaning, to the extent that the accepted theoretical framework in which they work is not adequate.<sup>3</sup>

However, the tensions of the decade should not be allowed to obscure the broad agreements that also characterized the Adventist literature on science and theology. This broad agreement, as we shall see, found expression in the way many issues were handled as well as in the type of issues that captured the interest of Adventists writing about science and religion.

## General Theory

During the seventies, Adventists continued to worry relatively little about the tensions between scientific and religious world views or the tensions between scientific and theological approaches to truth. But they did worry constantly about conflicts between scientific theories and biblical or Ellen White statements. Therefore, origins was the most important topic. As Jack Provonsa (1974) noted, Adventists were primarily interested in the *natural history* and not the theology of creation.<sup>4</sup> Most Adventist authors assumed information from the Bible and Ellen White was more reliable (if less specific) for building creation theories than scientific information. Hence, Adventist scholars were interested in defending the historical integrity and authenticity of the creation accounts.

To cite an example, William Shea (1977) of the Seventh-day Adventist Seminary summarized the many striking similarities in the Mesopotamian and Genesis creation accounts, but also emphasized the differences. He accounted for the similarities by postulating that a common source was available to them both, but that a deterioration occurred in the Mesopotamian accounts. The Bible therefore presents the most authentic account.<sup>5</sup>

Based therefore on the assumption that the Bible and Ellen White contain true descriptions of the natural history of origins, Adventist writers proposed their creation theories. Harold Clark (1973), a prolific contributor to Adventist literature for five decades, outlined a theory that is typical of mainstream Adventist views: an emphasis on a literal creation week, a recent creation, a universal Flood, limited evolutionary change within created kinds and a sharp qualitative distinction between man and the animals.<sup>6</sup>

Neufeld (1974) offered the most comprehensive formulation of creation theory to be published during the decade.<sup>7</sup> He began by expressing the belief of a creationist with the quotation “. . . the Lord made heaven and earth, the sea and all that in them is. . .” (Exodus 20:11). The differences of opinion, he noted were usually with the *when* and the *how*, rarely with the *why*.

Neufeld then presented his theory of creation in a series of 11 postulates which included most of the traditional Adventist convictions. According to Neufeld, the general acceptance of the theory of evolution was guaranteed by the ineffective and inept response to the theory by the nineteenth century advocates of creationism.

But Neufeld then noted that recent discoveries in science, particularly in genetics and molecular biology, “make it increasingly clear that the Creator cannot be ruled out on scientific grounds” and that a reasonable and calm presentation of the creation theory can be effective.

In the German annual, *Der Adventglaube in Geschichte und Gegenwart*, Klausewitz (1975) defended the viewpoint that all references to nature in the Bible have a religious implication and are not intended to be scientific statements. Klausewitz reached the conclusion that the actual history of the earth agrees

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in principle with current scientific theories. Biblical references to natural processes, he concluded, must be evaluated from the standpoint of faith, not science.<sup>8</sup>

**Creation Theology**

Although Adventist interest in creation theories was not matched by a corresponding interest in creation theology, some theological issues were aired in the Adventist literature on creation.

One traditional kind of creation theology, natural theology, includes the attempt to use features of the natural world as evidence for an intelligent Creator. It is of interest that although Adventist theologians of the past decade were only mildly interested in natural theology, many scientists were keenly interested. Adventist scientists testified frequently to their conviction that a study of

nature led them to a concept of a Designer-Creator.<sup>9</sup>

Of course, the earth often seems perverse as well as benign. Numerous Adventists writing about creation theory were lured into a consideration of the problem of evil by the obvious dark side of nature.<sup>10</sup> For example, in his article “Who Put the Worm in the Apple?” Wheeler (1975) confronted his readers with the cruelty of nature and its relationship to the concept of a loving Creator. He showed how this question troubled Darwin and claimed evolution was Darwin’s solution.

**R**elated to the problem of evil in nature is the question of freedom and determination. How do the catastrophies and accidents in nature harmonize with belief in divine providence? Is God really in control, or is our world a world of chance? An Adventist physicist, Smith (1977) discussed the opposing naturalistic and theistic world views from the standpoint of quantum mechanics:

The world is sustained by [God] and is subject to His will both in a general way and in specific cases. It, however, does not reflect His immediate will in all things. Man, as he appears in Scripture, stands between, He is part of the created world of things, but is given responsibilities that transcend the rest of nature. He is able to make judgments and to introduce novelty.<sup>11</sup>

Some Adventist theologians lamented the limited interest in creation theology. Jack Provonsha (1974) called the concept of God as Creator the fundamental and central tenet of the Christian faith and warned that creation theology can be obscured by the controversies about creation as “natural history,” and that it is more important to focus on the three major biblical elements of a theology of creation: that God is one, a unity; that God is the source of all that is; and that God is good — Creator, not destroyer.<sup>12</sup> Most Adventist writers, while simply taking these theological assertions for granted, were obviously more interested in the contentious issues surrounding the “when” and the “how” of origins.

### Creation Versus Evolution

Evolutionary concepts have been applied at various levels in the study of origins. Astronomical science speaks of stellar evolution in its attempt to understand the origin of the universe. Unlike many evangelical Christians who insist Genesis 1 teaches the whole universe was created during creation week, Adventists have traditionally applied the creation account only to the earth or, at most, the solar system. Therefore, stellar evolution has not been a burning issue for most Adventist scientists.

At least four major kinds of criticisms were launched against the evolutionary theory. It was called 1) “unscientific” — a metaphysical, not scientific theory; 2) a violation of a basic law of physics (the Second Law of Thermodynamics); 3) inadequate, because it could not account for the origin of life, and 4) incompatible with the facts of the fossil record. Theistic evolution was specifically attacked by some.<sup>13</sup>

John Clark (1976)<sup>14</sup> was one who charged that evolution was a metaphysical world view, not (primarily) a scientific theory. The “frightening implications” which he saw in an evolutionary world view were the impossibility of finding truth, the difficulties in a search for a basis of knowing, the denial of human freedom, and an inadequate basis for a system of ethics.

Roth (1977)<sup>15</sup> also questioned whether evolution qualified as a scientific principle and observed: “The concept of survival of the fittest of itself does not necessarily imply any evolution. Would not the fittest survive, whether they evolved or were created?” According to Roth, evolution cannot be adequately tested and has no predictive value. Therefore it can not be accepted as a scientific principle.

These philosophical attacks on evolution are examples of a creationist argument expressed more traditionally by Leonard Brand (1976-77):

The difference between a creationist and an evolutionist isn't a difference in the scientific data, but a difference in philosophy — a difference in the presuppositions. . . .”<sup>16</sup>

Creationists have repeatedly invoked the Second Law of Thermodynamics against evolution. This critique occurs also in the Adventist literature of the past decade, but not without some reservations. Watson (1973)<sup>17</sup> wrote that the Second Law is “diametrically opposed to the basic idea of evolution” since it seems to indicate a continual running down of the universe. Ritland (1970)<sup>18</sup> spoke of the “progressive disorganization of matter” and saw the action of a Creator, Designer and Organizer as a reasonable answer to the dilemma presented by the ever-increasing degradation of matter and energy, while Jost (1978)<sup>19</sup> asserted that from the viewpoint of thermodynamics, the evolutionary origin of living organisms was an impossibility.

But other Adventist authors were not quite as certain. Brown (1976)<sup>20</sup> opposed the view advocated by well-known creationist Henry Morris that the Second Law of Thermodynamics is a consequence of sin. And some Adventist scientists reminded their readers that open systems like the earth could theoretically show increasing levels of organization.

Adventist scientists took particular satisfaction during this past decade in challenging evolutionists with their inability to explain the origin of life in scientific terms. This is the one anti-evolutionist argument used by all major segments of Adventist science.

One of the best presentations of this argument was by Evard and Schrodetzki (1976).<sup>21</sup> They focused particularly on the attempts to produce amino acids synthetically by passing electrical charges through a reducing atmosphere thought to simulate the original atmosphere of the primitive earth. Such methods have produced some 18 amino acids during the past 25 years. However, the authors pointed out that the same energy that produces these amino acids also destroys them. The experimental apparatus needed a trap to remove the condensate containing the amino acids. Was there such a trap in the environment of the primitive earth? If not, the amino acid precursors to life would have been destroyed as fast as they were produced. Many other problems plaguing attempts to explain the origin of life scientifically were

also reviewed by Evard and Schrodetzki and other authors.<sup>22</sup>

A fourth anti-evolutionist argument favored by Adventist authors of the last decade cited the physical discontinuities separating the major forms of life, whether living or fossil. The position is as old as Darwin, but the passing years have added substance to it for increased knowledge of the fossil record has not filled in the notorious gaps. In other words — the missing links are missing still.<sup>23</sup>

Anderson and Coffin (1977)<sup>24</sup> coauthored a book, *Fossils in Focus*, that develops this approach at length. The book, after analyzing the fossil record of the major groups of animals and plants, concludes that numerous unbreached gaps exist between these groups. Anderson and Coffin claimed that, on the basis of this record, the creation model has more evidence to support it than evolution. They proposed a creation model in which all major kinds of organisms were created individually and given the genetic variability to adapt to different environments or habitats. Russell Mixter, who wrote a closing response in his book, concluded: “Logically then, one may say that within an order the varied species may have come from a common ancestor, but that the missing links testify to special creations of the first members of the orders.”

The thought arises that, if this is the true interpretation of the fossil record, the original world must have been very poor biologically at the time of creation (one species per order), and an overwhelming degree of variation must have occurred during the period of 6,000 years claimed to have elapsed since creation.

It would appear that although the “creation model” offered by Anderson and Coffin is typical of Adventist thought during the last decade, it nonetheless finds itself impaled on the horns of an uncomfortable dilemma. It must either reject a short chronology, or else accept truly fantastic rates of descent with variation — in other words “out-evolutionize” even the evolutionists! Oddly enough, it makes bedfellows of creationists and those modern evolutionists who are

looking for processes and conditions that can produce evolution sufficiently rapid to explain the gaps in the fossil record!

Both Coffin (1975)<sup>25</sup> and Ritland (1970)<sup>26</sup> called attention to a “gap” in the fossil record. The sudden appearance of complex fossils in the earth’s crust is a problem for evolutionary theory that is also as old as Darwin, who puzzled over it and admitted it was a valid objection to his theory. Creationists have speculated that sterile rocks below the layers containing the earliest complex fossils (the Precambrian) represent rocks that formed before creation week with the sudden appearance of complex fossils in Cambrian rocks representing creation.

Unfortunately, by the end of this past decade, this explanation had lost some of its force. Repeatedly, paleontologists reported finding single-celled microfossils in Precambrian rock layers. Moreover, just below the Cambrian levels, complex fossils are

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known that could be precursors to the Cambrian faunas, while the burrows of wormlike organisms have been reported well down into Precambrian rocks.

Adventist earth scientists showed an understandable reluctance to accept the new findings and clung to the hope the reports were erroneous. If major portions of the oldest layers in the earth’s crust contain only the fossils of single-celled organisms, how should these rock layers be interpreted by creation theories? On the one hand, if the rocks formed *before* creation week, why do they contain *any* fossils, even single-celled organisms? On the other hand, if they formed *after* creation week (or during the Flood), why are there no fossils of higher life forms? Clearly, a cherished argument is in need of refurbishment, although the sudden appearance of many complex types of fossils

in the Cambrian does continue to offer another example of “missing links.”

Although written at the beginning of the decade, Ritland’s (1970) summary of the fossil record relative to the evolution–creation controversy is still appropriate:

The theory of evolution must account for missing links between certain families and orders in all types of habitats and at all time levels except the “recent epochs.” By contrast, to interpret the data within the perspective of special creation one must explain the apparent absence of certain higher types of life in the lower or older deposits.<sup>27</sup>

### Geology and the Flood

Adventist literature has always emphasized the importance of harmonizing “Genesis and geology.” The emphasis on Flood geology increased in the last decade as the Geoscience Research Institute of the General Conference devoted itself to “building a Flood model” as its major tactic in defending a short chronology.

Typical of the research sponsored or encouraged by the Geoscience Research Institute in its effort to build a “Flood model” was the work of Leonard Brand (1978),<sup>28</sup> who restudied the fossil animal footprints in a sandstone layer exposed in the Grand Canyon. Previous scientific workers had concluded the footprints were made originally on dry windblown sand dunes — a conclusion that made it difficult to relate the formation of the sandstone to a watery event like the Flood. But Brand’s field studies and laboratory experiments led him to conclude the tracks were made below water. The fact that the tracks seemed almost always to be headed “uphill” relative to sedimentary structures in the rock layer encouraged Brand to speculate they were made as the animals fled the rising waters of the Flood.

Although church-sponsored publications expressed no doubts about a universal Flood responsible for most of the geological features of the earth’s crust, many doubts were raised about the so-called “New Geology” of George McCready Price, the famous Adventist “crusader for creationism” of the

first half of the present century. A process begun by H. W. Clark nearly 40 years ago was completed during the past decade. Price’s “New Geology,” with its rejection of the geologic column, its denial that the fossils occurred in a systematic order, its refusal to accept the reality of an Ice Age, and its insistence that “overthrusts” (older layers “thrust” over younger layers by compressive forces) were an invention of uniformitarian geologists to save their preconceived evolutionary ordering of the fossils, became officially the “Old Geology.”

The new geology follows H. W. Clark’s rejection of Price’s geological system. It accepts the validity of the geological column (and the order of the fossils in the earth’s crust). It accepts the evidence for extensive past glaciation. And it follows H. W. Clark in substituting for Price’s system an ecological zonation theory as the primary explanation for the systematic distribution of fossils in the earth’s crust. According to the ecological zonation model, the order of the fossils does not represent an evolutionary order through time, but rather the order in which different antediluvian ecological zones were buried by the slowly rising waters of the Flood.

Over the last decade, a number of Adventist writers directly or indirectly expressed their discomfort with some of the arguments and methods employed in the literature of creationists. Typical is the reaction of Adventist writers to the reported association of human and dinosaur fossil footprints in the Paluxy riverbed near Glen Rose, Texas. If this association were true, it would be devastating to current evolutionary theory (dinosaurs supposedly died out 60,000,000 years before man appeared on earth). Creationist literature touts this association as a clear falsification of standard evolutionary geology. But Adventist writers were skeptical of these reports. B. Neufeld (1975), after studying the tracks, reported:

The Glen Rose region of the Paluxy River does not provide good evidence for the past existence of giant men. Nor does it provide evidence for the co-existence of such man (or other large mammals) and the giant dinosaurs.<sup>29</sup>

Also illustrative of the scientific restraint of

some Adventist authors in the past decade was their caution about the claims made by groups searching for Noah's ark. Significantly, Adventist authors wrote comparatively little about the ark. And when they did publish on the topic, they usually tended to focus on the errors and inconsistencies they saw in the reports that were circulating. Shea (1977), for example, reviewed two films that claimed to show the finding of the ark on Mount Ararat, pointing out the errors both films contained.<sup>30</sup> Shea concluded the wood brought down from the mountain may have come from crosses or a shrine built by Armenian Christians, one of which was dated by experts at A. D. 586.

Taylor and Berger (1979) also reported on the wood brought down from Ararat. Taylor presented a table of the results of seven radiocarbon determinations by six different

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laboratories. The results obtained vary between 1,190-1,690 radiocarbon years, much too young to be ark wood. Taylor commented:

Some commentators have suggested that the samples had been “contaminated” by some unspecified mechanism(s) as a result of their association with the glacier environment. We are not aware of any known physical or chemical contamination that would not be removed by standard pretreatment methods. . . .<sup>31</sup>

Another consequence of the increasing sophistication of Adventist earth scientists was a widening concern over the scientific credibility of Flood geology. Serious doubts about the scientific status of Flood geology were rarely expressed in church-sponsored publications during this past decade; nevertheless, indications that Flood geology faced difficult problems were not lacking. The promotion by church officials of a Crea-

tion Statement affirming Flood geology was a tacit admission that fundamental (and threatening) differences of opinion existed. SPECTRUM provided an outlet for a variety of ideas, including the dissenting opinions of some Adventist scientists employed outside the denomination. And finally, reports filtering back from the summer Geological Field Conferences sponsored by the Geoscience Research Institute revealed that even some denominationally employed scientists had serious reservations about the scientific viability of Flood geology.

For many years, almost annually, guided geological tours have been held in North America under the auspices of the Geoscience Research Institute, originally under the direction of Richard Ritland, and more recently under Robert Brown. From time to time, brief reports of these tours have appeared in the *Adventist Review*. But as far as I am aware, the 1978 tour was the first one to be the subject of two critical appraisals<sup>32</sup> that made it clear that sharp differences of opinion characterized the tours.

Geraty's (1979) review in SPECTRUM of the 1978 Geoscience field trip analyzed some of the specific questions raised about Flood geology. For example, he linked the well-known problems posed by the Yellowstone Fossil Forests for Flood geology with those of the Wyoming oil-shale beds studied intensively by a young Adventist geologist, Paul Buchheim. Buchheim concluded the oil shales accumulated under an ancient lake, not during the Flood. Geraty comments:

The Green River Formation [oil shales] is approximately the same geological age as the Yellowstone Fossil Forests; consequently, it is difficult to have the latter being floated into place by the Noachian Flood, while just to the south one has the fluctuating fortunes of a living lake. Nor can one escape this dilemma by claiming that Eocene in one location is not contemporary with Eocene at the other, because in this case there is a physical stratigraphic tie between the formations in question.<sup>33</sup>

The formation of coal beds also was studied on the field trip. Coffin suggested

that these beds were due to floating masses of vegetation during the Flood. Geraty comments: "Deep in a coal mine, we observed perhaps the most dramatic counter evidence — dinosaur tracks and trackways on top of coal seams. . . . If coal seams represent mats of vegetation afloat in flood waters, how were they able to bear the tonnage of so many dinosaurs at so many levels, and where were the beasts going?"

Geraty also commented on the evidence the group saw for not just one but many lengthy "Ice Ages" scattered throughout the geologic history of the earth.

Several Adventist authors discussed the scientific problems faced by Flood geology in other SPECTRUM articles. Most notably, the fossil forests of the Yellowstone region were analyzed by Ritland and Ritland in a 1974 SPECTRUM article. The Ritlands recognized more than 40 successive layers with stumps of petrified trees up to 12 feet in diameter and 20 feet in height "spaced through approximately 1,500 feet of volcanic strata." They concluded:

. . . there is no question that the time problem to which the fossil forests contribute has an important bearing on fundamental theological issues. We are entirely sympathetic with any thorough and careful effort to solve the problem by endeavoring to encompass earth history in a short period. Nevertheless, as we have carefully studied the fossil forest outcrops throughout the volcanic field and evaluated the converging lines of data bearing on their deposition together with the broader geological picture in which they fit, the weight of evidence has led us to conclude that successive forests are represented.<sup>34</sup>

The Ritlands' article was highly significant. It directly challenged traditional viewpoints by presenting as their *studied conclusion* a model incompatible with either Flood geology or a short chronology for life. The Ritlands, however, explicitly concluded that the upright stumps of the fossil forests grew right where we find them today. This conclusion required a much longer history for life on earth than traditionally accepted by the church.

While still a colleague of Ritland at the Geoscience Research Institute, Harold Coffin began his own study of the Fossil Forests. Coffin acknowledged that he, too, believed the forests to be *in situ* — until he realized the temporal implications. He then devoted his energies to the search for a Flood model interpretation. Based on many summers of field work, Coffin was able to develop a flotation theory. He summarized his theory in a 1979 SPECTRUM article that should be read against the background of the Ritland article.

Volcanic activity in the Yellowstone region occurred while the area was at least partly under water. Trees, some vertical, floated in the water along with organic debris. As trees and vegetable matter became water saturated, they settled down onto the breccia at the bottom. Within a relatively short time (days or weeks), another slide moved over and around the trees and organic debris. Before the appearance of each succeeding breccia flow, more trees and organic matter settled to the bottom. Thus, layer upon layer of trees and organic zones were built up in a relatively short period of time.<sup>35</sup>

The Fossil Forest debate has brought to the surface some of the sharp differences of Adventist opinion that are often muted. As in the articles discussing the Fossil Forests, the differences are usually debated as scientific differences — but the nature of the debate suggests they can be better understood as a theological and cultural struggle couched in scientific categories.<sup>36</sup>

### The Age of the Earth

The age of the earth was very much in the minds of many Adventist authors in the past decade. This unusual interest may be partially ascribed to a historical commitment to the belief that the genealogies of Genesis 5 and 11 and statements by Ellen G. White demand an earth only about 6,000 years old.

Adventist publications presented three main views of the age of the earth. Nearly all the authors attempted to base their theories on both Scripture and scientific data. Advocates of the first main view held that the planet earth was only about 6,000 years old. Proponents of the second view insisted that



the earth was indeed very old, but that life was created only 6,000 years ago. The third view was that both the earth and life on this planet were *much* older than 6,000 years and that the length of time since the creation of life on earth was not indicated in Scripture. This final view was not published in church-sponsored literature, however, and was specifically rejected in the Creation Statement developed by church officials.

Although most Adventist authors of the past decade defended a recent creation week, relatively few insisted the earth itself was young. Most were satisfied to allow for the possibility of an old (although lifeless) earth that was created in a primordial creation event long before the creation week of Genesis 1.

The most interesting and controversial scientific defense of a young earth was offered by Robert Gentry, who published a series of articles in the scientific literature on pleochroic halos and their implications.<sup>37</sup> Pleochroic halos are produced in minerals such as mica by the bombardment of alpha particles from radioactive nuclei enclosed in the mineral. Gentry implied that his halos indicated some of the earth's oldest rocks were created instantaneously and recently.

Gentry emphasized the presence of halos of an extremely short-lived element, polonium, which he felt was difficult to explain on the basis of currently accepted cosmological models of the earth's formation. In other words, the rocks of the earth came into existence instantaneously only a few thousand years ago.

Answers to Gentry's views were not slow to appear in the scientific literature.<sup>38</sup> Adventist physicists also gave little support to Gentry's views, and many actively opposed them. Robert Brown (1978) observed:

. . . the data provided by pleochroic halos give essentially no information as to how rapidly these halos have been formed. . . [instead] Pleochroic halos provide one of the best evidences that radioactive decay rates have not changed by more than approximately 30% during the time minerals found in planet Earth have been in exist-

tence. . . a change. . . of only 30% accomplishes nothing with respect to bringing radiometric dates within a 6,000-year time span. . . it must be stated that the uranium and thorium halo investigations made by Mr. Gentry provide absolutely no physical evidence for change in radioactive decay rates during geological time. . .<sup>39</sup>

Robert Brown, director of the Geoscience Research Institute, continued to be the most vigorous champion of the theory that the earth was as old as science claims (approximately 4.5 billion years), but that creation week and all fossils were recent. Brown argued in several papers that the combination of an old earth and a recent creation week did no violence to the literal meaning of the text in Genesis 1 and allowed one to accept the basic validity of inorganic radiometric dating techniques.<sup>40</sup> Brown wrote repeatedly of the "Graveyard Hoax." By this he meant that

**"Defense of chronological schemes based on the genealogies of Genesis 5 and 11 came primarily from scientists (not biblical scholars) during the last decade."**

just as a skeleton in a graveyard is not as old as the soil in which it is buried, so also fossils are not necessarily as old as the rocks in which they are found.

Brown presented numerous powerful arguments for the chronological significance of inorganic radiometric dating techniques. He noted, for example, that five different techniques for determining radioisotope age when applied to a rock sample from the Bear-tooth Mountains in Montana yielded ages ranging between 2.5 and 2.8 billion years. When so many different methods give the same results, the results must mean something, Brown claimed. He asked: "Can one believe these radioisotope ages?" His answer? A firm "Yes."<sup>41</sup>

Brown's defense of the radiometric dating techniques was impressive to most of his peers. But many of his colleagues in physics and the earth sciences were not convinced by

his arguments for separating the age of the rocks from the age of the fossils found in the rocks. They felt that the logic of his arguments led inevitably (if pursued consistently) to acceptance of the geologic time scale for the age of the fossils.

**B**asic to the conviction of many Adventist authors that creation week was a recent event (about 6,000 years ago) was their interpretation of the genealogies in Genesis 5 and 11. These genealogies were the subject of several articles. Tuland (1974) approached them from the standpoint of linguistics and pointed to the evidence for important spoken and written languages in major cultures many centuries before the traditional dates assigned to the Flood.<sup>42</sup> Geraty asked whether the biblical genealogies should be used as an index of time (1974). He concluded:

It must be stated then, that our present knowledge of human civilization in the ancient Near East apparently goes back (at Jericho, for instance) to the seventh millennium B.C. This information was not available to earlier generations of Bible students, and they assumed that the Genesis genealogies were unbroken chains. The evidence indicates, however, that this assumption may legitimately be called into question. . . . The Bible does *not* assign a 6,000-year history to the span of human life on the earth. This is done only by a particular *interpretation* of the Genesis genealogies — an interpretation which we have seen does not rest on very solid ground.<sup>43</sup>

It is interesting to note that defense of chronological schemes based on the genealogies of Genesis 5 and 11 came primarily from scientists (not biblical scholars) during the last decade. Robert Brown (1975)<sup>44</sup>, for instance, defended the time relationships of these genealogies, but Don Neufeld (1975) an editor of the *Adventist Review* and an Old Testament scholar, retorted, “We must not demand of the Bible information that God did not place there. . . . although chronological schemes have been worked out, such as the one Dr. Brown demonstrated, it is dif-

ficult satisfactorily to integrate all the chronological data in the Bible into any one scheme.”<sup>45</sup>

Many Adventist scholars were keenly aware of the challenge posed by the carbon 14 dating method to a chronology based on the genealogies of Genesis. Carbon 14 dating was the subject of more papers than any other dating technique. The method was especially troubling to many Adventists because of its widespread applicability, its ability to date the organic remains of past life, and its provision of a time scale for the historical period and its immediate antecedents that seemed to be generally dependable but that exceeded by far traditionally allotted time for post-Flood history.

Robert Brown (1969)<sup>46</sup>, although agreeing that the premises and methods were sound, and that the dates obtained by this method were acceptable up to about 2000 B.C., postulated that there was more carbon dioxide in the atmosphere prior to the Flood, and that the pre-Flood biosphere contained eight times as much nonradioactive carbon and at most 1/100, and possibly as little as 1/1000, of the present value of radioactive carbon. By suggesting these markedly different values, Brown could reduce all C-14 dates prior to 2000 B.C. to fall within the timespan of the 6,000 years concept which he sought to rescue. The problem Brown faced with this hypothesis is that he offered no convincing supporting evidence for it and that other dating methods which have no relation to radioactive carbon yield dates similar to the ones obtained by carbon-14 (see Barnes, 1971).<sup>47</sup>

The strongest defense of the C-14 method was offered by Ervin Taylor, director of a radiocarbon dating laboratory at the University of California at Riverside.<sup>48</sup> In a 1977 article, Taylor reviewed the experiments leading to the use of the method for dating purposes.<sup>49</sup> He described W. F. Libby’s specific research program to test the possibility of using radiocarbon as a dating method which resulted in a 1949 report on the C-14 dating for many samples of known age. Since that time, thousands of archaeological specimens have been dated by this method by more than 100 carbon dating laboratories all

over the world. Are these dates reliable? Taylor (1974)<sup>50</sup> suggested they are, emphasizing that many other methods — obsidian hydration, thermoluminescence, archaeomagnetic data, the potassium-argon method, fission track dating, dendrochronology, varve dating, fluorine diffusion and archaeological sequences — support and confirm the C-14 results.

Another dating method of particular interest to Adventists came to the fore in the last decade and also provided general confirmation of C-14 ages. The amino acid dating method based on changes in proteins was developed largely by P. E. Hare, an Adventist scientist who once was a member of the Geoscience Research Institute, but now is affiliated with the Carnegie Geophysical Laboratory in Washington, D.C.<sup>51</sup> Hare originally developed the method in order to undermine the credibility of C-14, but, to his consternation, the results he achieved were consistent with C-14 ages. In 1974, Hare, reviewing the history of amino acid dating, stated:

Each of the nearly 20 different amino acids found in recent shells, bones and teeth has its own characteristic reaction rate constant and activation energy for the various chemical reactions involved. There is a sufficient number of different amino acids to define both the time and temperature history of the fossils in question.<sup>52</sup>

The apparent consistency of results achieved by so many different, often independent, dating methods was recognized as a serious problem by Adventist authors. Those who defended traditional short-chronology views argued that the consistency was only apparent. They pointed to inconsistent dates that appeared at times in the scientific literature and argued that other inconsistent dates were ignored and not published by secular scientists. But this very serious charge was never adequately documented.

The profound differences of opinion expressed by authors analyzing the age of the earth appear to be similar to the differences expressed about the scientific credibility of Flood geology. They appear to be at heart

theological, not scientific, differences. Robert Brown, foremost Adventist critic of all dating methods yielding ages for life greater than 6,000 years, admitted as much. He forthrightly informed the ministerial pre-session before the Vienna General Conference meetings in July 8, 1975:

In the areas of time problems and evidence for the Flood described in Genesis, chapters 6-9, one must depend on faith in the testimony of Scripture for in these areas there is less convincing support from scientific evidence. . . .the scientific evidence in support of biblical testimony is weakest with respect to the amount of time that has passed since Creation Week and since the Flood.<sup>53</sup>

In short, a careful review of the Adventist literature of the last decade on dating methods reveals that the defense of a recent creation week about 6,000 years ago and young fossils is based not on the weight of the scientific evidence, nor on any fatal weaknesses in the evidence supporting the commonly accepted scientific time scale, nor even on the clear teaching of Scripture (many careful exegetes concluded Scripture does not specify a date for the Flood or Creation), but rather on the statements of Ellen G. White. Colin Standish (1974) seems to have recognized this when he wrote:

While the Bible does not give a precise date for Creation Week, its internal evidence supports the six-thousand year approximation. However, as the Bible makes no direct statement to this effect, it is the Spirit of Prophecy references that become most significant.<sup>54</sup>

### Fossil Man

The problems and questions associated with fossil man are many, both within paleoanthropology and in theological thought.<sup>55</sup> Adventist theologians and scientists agree that there is a gap between the mental and cultural characteristics of man and other mammals.<sup>55</sup>

Harold Clark (1976),<sup>57</sup> after discussing the position of the Australopithecines (the so-called "ape-men"), accepted a paleolithic stone age in the history of man, with a progressive refinement of stone tools in the suc-

cessive layers of cave deposits, followed by the bronze and iron periods. He assumed this stone age could have been of relatively short duration until postdiluvial man again found sources of metal.

However, Harold Coffin has some interesting and provocative conjectures about early man:

Although nature does indicate that major categories such as families, orders, and larger taxa have been fixed to a great extent, the Bible does not say that there can be no crossing between these larger groups. May it be possible that such behavior has actually been a part of the history of life in the past. . . there is support for this view in both the Bible and the Spirit of Prophecy writings, as well as in nature. . .

It is attractive to think that. . . the so-called ape-men with what appear to be human and ape characteristics, were crosses between . . . man and ape. . .<sup>58</sup>

Coffin goes on to say that we ought to keep our

**“The profound differences of opinion expressed by authors analyzing the age of the earth appear . . . to be at heart theological, not scientific, differences.”**

minds open to the possibility that before the Flood crossing between more diverse kinds of animals may have occurred on a greater scale than today.

He carefully avoids the word, but he seems to have in mind Ellen White’s comments on amalgamation. Frank Marsh (1973) urged the church to reject the view that amalgamation meant man and beast had ever crossed. He felt such a concept was “unscientific” and that crosses between created “kinds” was impossible.<sup>59</sup> Apparently, Coffin sees in the interpretation of that theory prior to Marsh a way of accounting for the rapid biological change necessitated by his interpretation of the fossil record. He wondered if specimens such as the Java man skulls could represent “primitive and degenerate human beings who had wandered away from the centers of civilization and lapsed gradually

into a crude and degraded social and economic culture that included cannibalism?”<sup>60</sup>

Lugenbeal (1974) reviewed the significance of Richard Leakey’s find of skull 1470 and its impact on theories of human history, and suggested that Java man (*Pithecanthropus erectus*, *Homo erectus*) is a reality, a variety of fossil man with a wide distribution. Lugenbeal (1978) counseled:

Conservative creationists would do well to pay heed to this find in view of the tendency of some creationist literature to dispute the authenticity of *Homo erectus*. . . In my judgment, Leakey’s latest finds should lead creationists to stop trying to hide from *Homo erectus* by calling him an ape.<sup>61</sup>

Lugenbeal treated at some length the more recent findings in paleoanthropology, particularly the *Australopithecines*, and asked if they were “ape-men” or just apes, and if man could have evolved from them. He observed that they “may be neither missing links nor ‘simply apes.’” He based this especially on the evidence of an upright bipedal gait from the fossil skeleton of Lucy found by Johanson in the Hadar region in Ethiopia in 1974. An additional problem was added when Richard Leakey discovered a specimen of *Homo erectus* in the same beds in which one specie of *Australopithecine* was found.

Lugenbeal also listed a number of questions which must be answered by a biblically based model that considers the East African hominids. These problems include the fact that the new *Homo* fossils may be true man, yet they are quite different from modern man, with a smaller brain size and stature, certainly not giants. The East African fossils represent the oldest human fossils yet found, situated deep in rocks in which they are associated with extinct species of animals and with extremely crude stone tools. According to Lugenbeal, “The characteristics of these rocks do not seem compatible with extensive transport or deposition below the waters of the Flood.”<sup>62</sup> Some of the layers, for example, include “buried soil horizons with root markings.” Lugenbeal noted that a theory of pre-Flood or post-Flood deposition must deal with these problems.

Creationists can be grateful that the new finds leave earliest man, as Mary Leakey puts it, with “largely hypothetical ancestors.” But creationists must also be ready and eager to confront the whole spectrum of information coming out of East Africa and to look at the early-man fossils in their full geological and archeological context.<sup>63</sup>

Elsewhere Lugenbeal (1978) reviewed the main types of fossil man found so far and asked if any of them could qualify as the missing link in human ancestry and thus replace Adam. He concluded: “Maybe — just maybe — we can’t prove our suspects guilty because there never was a murder! Maybe Adam’s death is an illusion created by evolutionary theory, not a reality supported by fossil facts.”<sup>64</sup>

### Epilogue

Several concluding observations arise from consideration of the interplay between science and religion during the past decade. Throughout the seventies, official Adventist literature continued to insist that the Flood was universal and the history of life short.<sup>65</sup> During the last years of the Pierson administration, the church sought to buttress its theological and scientific commitment to these concepts by developing a statement of Creation. The controversy that surrounded the promulgation of this statement belied, perhaps, the apparent uniformity of opinion expressed in church-sponsored publications concerning earth history. Nevertheless, after considerable debate over its purpose and content, the statement was ultimately published in the *Adventist Review* for consideration by the church at large.<sup>66</sup>

The emphasis on origins has been striking. This emphasis was surely an outgrowth of the conservative theological convictions of most Adventist authors. Within the general topic of origins, the issues of time and geology dominated the literature. A topical bibliography of recent studies shows 59 entries under the “Age of the Earth,” more than twice the entries logged under any other category!

This apparent fixation on the issue of time invites comment. Was it overblown and unnecessary? Many Adventists would say “yes.” Surely time is intrinsically of limited importance to our understanding of God’s nature and

character. Are not a 1,000 years as a day for God?

There is another side to this question, though. Most participants in the debate about origins sensed that if modern science is right about time, Adventists will probably have to do theology differently — perhaps very differently. Furthermore, some of the most knowledgeable scientists suggested that if science is right about time, Adventists will probably have to reevaluate the church’s posture relative to *many* scientific theories that model the origin of our world as we know it. The “when” and “how” of origins are not easy to disentangle.

Projecting future developments is foolhardy. But it is safe to say that the struggles and topical emphasis of the seventies will persist. A marriage of sorts between Adventism and geology has taken root. George McCready Price midwived the courtship, and the Geoscience Research institutionalized the marriage.

Established to help the church solve intelligently the problems raised by modern geology, the Geoscience Research Institute, in spite of its best efforts, has probably opened Pandora’s box. It certainly has propelled us into a more informed and serious confrontation with the earth sciences — the church can never again be satisfied with simplistic armchair speculations. It took us to the outcrops and showed us the problems — even when we didn’t want to see them. It inspired our young to study geology academically and led to the establishment of a graduate program in earth science at an Adventist university. The church can no longer escape the explanatory power of modern geological theories. We have lost our innocence, and the challenge of making Flood geology a persuasive way of doing geology can never be easy again.

Therefore, the tensions will continue. How acute they become in the next decade may well be determined by the way the church understands the role of Ellen White in the scholarly exegesis of the Bible and the scientific interpretation of nature.

Can the tensions over origins in Adventism be defused — either theologically or scientifically? How will the church ultimately come to terms with these issues? In more ways than one, time will be telling.

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