

Creation Research Society Quarterly

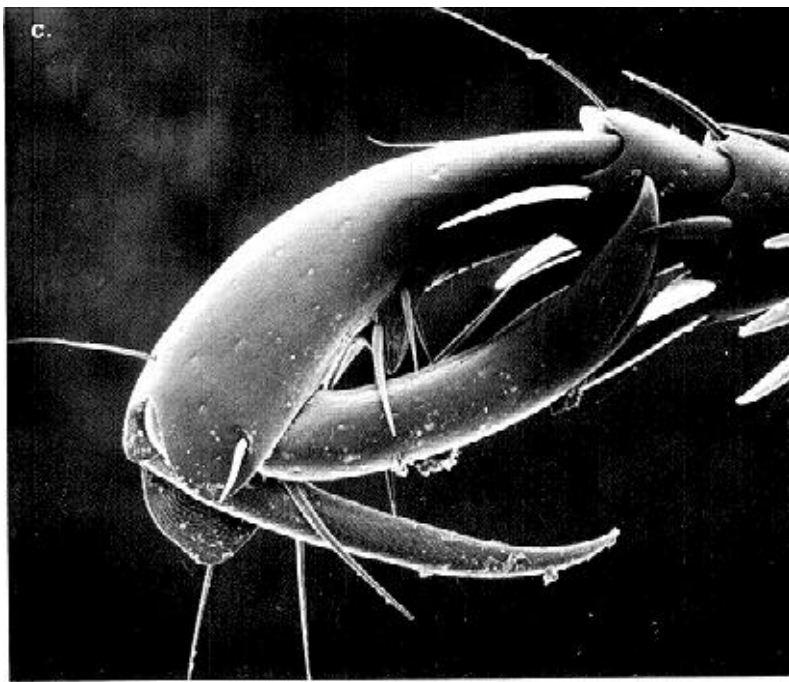
Haec credimus:

For in six days the Lord made heaven and earth, the sea, and
all that in them is and rested on the seventh. — Exodus 20:11

VOLUME 23

DECEMBER 1986

NUMBER 3



NOT A MONSTER FROM OUTER SPACE BUT A JAPANESE BEETLE (*Popillia japonica*)



THE SCOURGE OF SUMMER IN MANY REGIONS OF THE U.S.A. EACH YEAR, IN THIS COUNTRY, THE INSECT CAUSES MORE THAN \$250 MILLION WORTH OF DAMAGE. A NATIVE OF JAPAN, IT WAS FIRST FOUND IN 1916 NEAR RIVERTON, N.J.

(a) FRONT VIEW

(b) SIDE VIEW

(c) CLAW-LIKE FRONT LEG, WELL-ADAPTED TO GRASP ONTO LEAVES AND FRUITS AS IT FEEDS ON MORE THAN 275 DIFFERENT PLANTS

CREATION RESEARCH SOCIETY QUARTERLY

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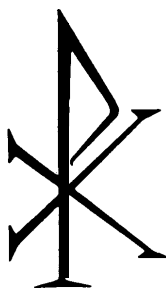
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QUOTE

Faith affirms absolute ontological transcendence whereby the existing transcendent is "totally other" than and yet wholly responsible for the immanent. Reason denies any such "totally other" (in the Christian sense of the term) and absorbs everything in the monism of the mind. Number one is primary to reason: the oneness of "the self-creativity of the universe"; number two is primary in faith: the twoness of creator-creature. That is why the problem of real creation from nothingness always turns up as the ultimate issue between faith and reason. (A Moslem understands perfectly how God created everything from nothing, including matter. But Aristotle and the Greeks always thought of matter as being eternal, and the whole idea of creating from nothing did not even occur to them.) How, therefore, can there be no conflict between them when either faith uneasily absorbs reason or reason uneasily absorbs faith?

Malik, Charles H. 1984. Faith and reason in the universe. *Modern Age* 28:318-19.

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COVER PHOTOGRAPH

These photographs are views taken in a scanning electron microscope of a gold-coated beetle by Richard R. White.

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CREATION RESEARCH SOCIETY

History The Creation Research Society was first organized in 1963, with Dr. Walter E. Lammerts as first president and editor of a quarterly publication. Initially started as an informal committee of 10 scientists, it has grown rapidly, evidently filling a real need for an association devoted to research and publication in the field of scientific creation, with a current membership of over 600 voting members (with graduate degrees in science) and over 1500 non-voting members. The *Creation Research Society Quarterly* has been gradually enlarged and improved and now is recognized as probably the outstanding publication in the field.

Activities The society is solely a research and publication society. It does not hold meetings or engage in other promotional activities, and has no affiliation with any other scientific or religious organizations. Its members conduct research on problems related to its purposes, and a research fund is maintained to assist in such projects. Contributions to the research fund for these purposes are tax deductible.

Membership Voting membership is limited to scientists having at least an earned graduate degree in a natural or applied science. Dues are \$15.00 (\$17.00 U.S. for overseas) per year and may be sent to Glen W. Wolfrom, Membership Secretary, P.O. Box 14016, Terre Haute, IN 47803. Sustaining membership for those who do not meet the criteria for voting membership, and yet who subscribe to the statement of belief, is available at \$15.00 (\$17.00 U.S. for overseas) per year and includes a subscription to the *Quarterlies*. All others interested in receiving copies of all these publications may do so at the rate of the subscription price for all issues for one year: \$18.00 (\$20.00 U.S. for overseas).

Statement of Belief Members of the Creation Research Society, which include research scientists representing various fields of successful scientific accomplishment, are committed to full belief in the Biblical record of creation and early history, and thus to a concept of dynamic special creation (as opposed to evolution), both of the universe and the earth with its complexity of living forms.

We propose to re-evaluate science from this viewpoint, and since 1964 have published a quarterly of research articles in this field. In 1970 the Society published a textbook, *Biology: A Search for Order in Complexity*, through Zondervan Publishing House, Grand Rapids, Michigan 49506. Subsequently a Revised Edition (1974), a Teachers' Guide and both Teachers' and Students' Laboratory Manuals have been published by Zondervan Publishing House. All members of the Society subscribe to the following statement of belief:

1. The Bible is the written Word of God, and because it is inspired throughout, all its assertions are historically and scientifically true in all the original autographs. To the student of nature this means that the account of origins in Genesis is a factual presentation of simple historical truths.

2. All basic types of living things, including man, were made by direct creative acts of God during the Creation Week described in Genesis. Whatever biological changes have occurred since Creation Week have accomplished only changes within the original created kinds.

3. The Great Flood described in Genesis, commonly referred to as the Noachian Flood, was an historic event worldwide in its extent and effect.

4. We are an organization of Christian men of science who accept Jesus Christ as our Lord and Saviour. The account of the special creation of Adam and Eve as one man and woman and their subsequent fall into sin is the basis for our belief in the necessity of a Saviour for all mankind. Therefore, salvation can come only through accepting Jesus Christ as our Saviour.

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EDITORIAL COMMENTS

It is my pleasure to introduce the first in a series of articles by George Howe on the search for fossilized pollen grains in Precambrian strata in the Grand Canyon. The work was sponsored by the Research Committee of the Society. This study has an interesting history and the positive results obtained in this, as well as the earlier Burdick investigation, should interest you.

A. W. Mehlert makes some interesting comparisons between Flood and uniformitarian geology referencing some recent articles that have appeared in the Quarterly.

The invited paper by Dr. von Fange introduces the topic of archaeology in relation to the Bible. The

interpretation of field evidence and the typical chronology arguments that surface in the creation and evolution discussions are presented.

John Moore cautions creationists on the use of the word evolution. Distinction should be made between macro and microevolution. Robert Kofahl carefully describes a proper definition of science. Dr. Humphreys notes a verification of his predictions from a previous Quarterly article about the magnetic field of Uranus. Your comments are invited on this issue.

Emmett L. Williams, Editor

INVITED PAPER

A REVIEW OF PROBLEMS CONFRONTING BIBLICAL ARCHAEOLOGY

ERICH A. VON FANGE*

Received 17 April 1986 Revised 11 August 1986

Abstract

Biblical archaeology as a scholarly discipline is introduced. The problems of interpretation of field evidence are discussed. Further source materials are listed. Typically the major area of disagreement between humanistic and conservative archeologists is that of chronology.

A Matter of Definition

Suppose by a combination of miracles you were able to determine that one of your ancestors lived in a certain village a thousand years ago and that the site of that village was accurately located, and here you are, spade in hand, to learn all you can about your ancestor. What would you find? Perhaps a few stone foundations of homes, bits of broken ceramics, buttons, metal fragments, maybe even a coin or two, but no writing of any kind is likely. Anything found beyond this would be amazing indeed. And now you try to put together your ancestor's life with only a fraction of 1 percent of the original data and well over 99 percent speculation. This illustrates in a sense the impossible task laid before archeologists of the Bible lands and why we should never be caught in the trap of thinking that somehow archaeology must "prove" the Bible.

It is no secret that most of what we may term Biblical archaeology is in the hands of those described by Schoville (1978, p. 97) as having "broad humanistic interests". Their own preferred term currently is "mainstream" in contrast to those who are identified as "conservative". Humanists believe in all sincerity that their speculations are "scholarship", while anyone differing from such views is a "fundamentalist". Recently van Hattem (1981, p. 18) concluded that the evidence supports the usual early date for the patriarchs accepted by conservative scholars. However, those pushing for the origin of the Abraham "stories" to a date later than David dismiss the conservative view as "funda-

mentalists", an all too common example of supporting a position by namecalling rather than from evidence.

A crystal clear statement appeared in the program of the annual meeting of the Society of Biblical Literature in 1969 that illustrates the so-called humanistic position:

The basic dilemma in historical Jesus (or read biblical archaeology instead of Jesus) research is not any complexus of technical problems but rather the seeming incompatibility between intellectual honesty and traditional Christian belief.

Nothing could be stated more clearly. Before he begins his research, the humanist already knows that the Bible is *not* true historically.

The humanists believe they are operating without presuppositions in contrast to those who accept the Bible as historically true. Yet the assumptions governing their interpretations are very plain in their writing. In their minds evolution is the great unifying principle of explanation. Modern cultures evolved in a long slow path from primitive to modern; the world is very, very old; the Bible is just another ancient book full of error and myth.

When one reads extensively in the field of Biblical archaeology, one cannot help noting with what glee speculation is seized upon if it runs counter to the Biblical record. For example, Finklestein, like Martin Noth in Germany, seized upon the Fall of Jericho as his chief illustration of how archaeology contradicted a Biblical statement, and accused G. Ernest Wright (1961, p. 15) of being driven beyond the reach of common sense in trying to uphold Scripture. And so we need not be surprised to find items such as this in the literature from the pen and the mouth of the humanist.

*Erich A. von Fange, Ph.D., receives his mail at 517 S. Occidental, Tecumseh, MI 49286.

This item by Rast (1981, p. 18) appeared several years ago regarding the discovery of sites identified as possibly Sodom and Gomorrah:

One prominent scholar who was supporting a grant for their excavations threatened to withdraw his support if they were indeed identifying their sites with the Biblical Cities of the Plain. There is a segment of the scholarly community which regards it as unscholarly to focus on possible connections between archaeological evidence and the Biblical record, because the evidence is often so tentative. Yet the most farfetched speculation is permitted in other areas of archaeological scholarship.

One gets the impression that the question of evidence is not raised as long as the Bible is under attack.

It should be noted that Biblical archaeology includes three areas of scholarly study—each unfortunately living in splendid isolation from the other two for the most part: Field or dirt archaeology; linguistic studies—the study of inscriptions; and Biblical studies—the study of Biblical text. Each has the potential of benefiting greatly from the other two. We give just one illustration: Kitchen (1966, p. 23) observed the strange and remarkable fact that modern literary criticism of the Old Testament thrives completely separate from actual literary finds of Orientalists who study the ancient manuscripts/inscriptions. For example, a certain literary style known to be common 1,500 years before Solomon is tagged as fourth century B.C. Greek, and therefore the wisdom literature is moved up 500 years to fit the notion.

Limitations of Biblical Archaeology

Biblical archaeology is not an objective science. Miller (1982, p. 213) stated that archaeologists tend to be overconfident regarding the possibility of reconstructing the details of Biblical history. Consider these points:

(1) The fragmentary nature of the evidence from the ancient Near East complicates the drawing of inferences. One reasonable estimate is that we have at hand less than 1/1000 of the potential evidence from antiquity based on the admittedly optimistic projection that 1/4 of the available sites have been surveyed, that 1/4 of these sites have been excavated, that 1/4 of the excavated sites have been adequately examined, and that 1/4 of the materials and inscriptions have been published. In reality, hardly more than an estimated 200 of over 5,000 sites in all of Israel and Jordan have been excavated, and less than 50 of these can be considered major excavations. In Mesopotamia less than 1 percent of the total sites have been excavated. No sites in Israel except Zumrun and Masada have been totally excavated. The bulk of the potential evidence remains buried. Thus we see that only a tiny fraction of the full picture of ancient life was preserved and these fragments are almost all mute. From there it is human inference and imagination perhaps unrelated to reality (Schoville, 1978, p. 121). According to Lapp (1963, p. 121) less than 2 percent of the best sites in Palestine have been touched by archaeologists. While much work has been done in the past two decades, we can hardly say that this situation has really changed.

(2) By its very nature, Biblical archaeology is a very, very slow, careful, tedious process. At the rate the important Biblical site of Hazor is being excavated, the work will continue for another 800 years. (Schoville, 1978, p. 121).

(3) Field archaeology often produces a lopsided view of an age. All precious things that could most tell us of the past are those things that burned, weathered away or decayed. Even the documents we find on very rare occasions are non-representative or are not open to study, and so we are brought to a halt.

(4) Normally, only a tiny area of an entire site can ever be dug (Kitchen, 1977, p. 12). Tell Beit Mirsim where Albright “established” the standard archaeological chronology had only about 1/4 of the surface excavated, but only parts of that area were excavated down to bedrock. All kinds of important features can be missed by accident. For example, a time period may exist in part of a site that was not excavated, and therefore is missed. If one digs 5 percent, one misses 95 percent, and if you are not on the site you thought it was, such as happened at Heshbon, the error is 100 percent.

(5) The monstrous growth of pure speculation is illustrated by the huge amount of literature developed around the JEDP hypothesis. As Kitchen observed (1966, p. 23) even the most ardent advocate of the documentary theory must admit that there is no single scrap of external, objective evidence that any alleged source-document ever existed. But JEDP rises above, as it were, the need for any evidence. It is a kind of badge that publicly proclaims an attitude toward the Bible, that it is no different than any other ancient document.

(6) Modern archaeology is designed to gain maximum information from a stone-age culture, but this is not really what we want to find. Kathleen Kenyon, the founder of modern scientific archaeology around the mid-20th century, was characterized by Mendenhall (1981) as one who gathered infinite amounts of useless detail, and who ignored the value of texts in shedding light on the past. Her excavations covered too tiny a slice, carried out endless elaboration, and never got to any real results or relationships. She was blinded by the trees and never saw the forest. This rather unkind critique stemmed from his work under her supervision at Jericho, the excavation that won for her top rank in scientific archaeology!

Another classic speculation repeated for decades as pure truth was that Moab and Ammon did not exist at the time of the Exodus/Conquest, and therefore those portions of the Bible were not true. More recently investigations have concluded that archaeological sites in those areas are “much older” than previously thought (van Hattem, 1981, p. 91).

If anyone doubts that archaeology has limitations when it comes to interpreting the data, he has only to consider the bitter archaeological debate between two prominent Israeli archaeologists: Looking at the same evidence on the Conquest, Aharoni said it was peaceful; Yadin said military conquest. Pottery which Yadin dated to the divided kingdom, Aharoni dated to the time of King David. Aharoni said the destruction of Level III at Lachish was that by Sennacherib in 701

B.C., but Yadin said it was a century later from the Babylonian attack of 597 B.C. (Anon., 1980, p. 1).

More recently a passionate debate about the excavation on top of Mount Ebal appeared in 1986. Adam Zertal (1985, p. 26) shows why he believes he has found Joshua's altar. Aharon Kempinski (1986, p. 42) dismisses the structure as an Iron Age I watchtower. And the battle appears to be more one of ideology than of evidence.

Problems of Chronology

The core of the most heated controversies in the field of Biblical archaeology has always been chronological uncertainty (James, 1981, p. 70). Conventional tables of archaeological time periods which flow out of and are based on the same assumptions as the geological table of time, especially the assumption of uniformitarianism — long, slow, uniform, gradual change. A layer of sediment four feet thick must have taken twice as long as one of two feet. The periods and ages of archaeology are universally accepted as accurate within a handful of years in almost all the literature.

The chronology of Palestinian pottery was established by William F. Albright (1971, p. 84) from his work at the site of Tell Beit Mirsim in the 1920s. Further refinements of course have been made and the precision of ceramic dating for the Biblical period is thought by some to be within a century, others say within 50 years, and one scholar in a recent lecture said that ancient pottery could be dated within 10 years. The whole structure, as we will observe elsewhere, hangs on the validity of Egyptian chronology — a fragile thread indeed.

Albright (1971, p. 84) believed that just about everything had been solved:

Since Egyptian chronology is now fixed within a decade or two for the Middle Bronze and Late Bronze Ages, our dates are approximately certain wherever we can establish a good correlation with Egyptian cultural history . . . thanks to scarabs and inscriptional evidence . . .

But only a few short years later, Israeli scholar Rainey (1982, p.220) speaks of Albright's subjective impressions about Tell Beit Mirsim, that the Albright school is in practice based more on personal opinions than on actual finds, and that too often the opinion of an excavator has usurped the place of true archaeological evidence. Similarly Miller (1979, pp. 37-47) observed that Albright's intuitive but faulty ideas of chronology and interpretation are so ingrained in the generation of scholars he trained at Johns Hopkins that archaeology no longer looks at actual evidence. Yet this same chronology continues on and on.

Dr. Adnan Hadidi (1970, p.11), the respected Director of Antiquities of Jordan, made the following remarkable statement about dating accuracy:

It is a strange anomaly that pottery of the Middle and Late Bronze Ages, can in Palestine at any rate be dated by its contexts to within 25 or 50 years with reasonable accuracy, whereas as soon as the historically far better-known Roman period is reached, a couple of centuries seems to be the closest limit one can hope for.

Can anyone seriously believe that accuracy improves as we move farther back into time?

In the past several decades a few scholars who questioned the "received" chronology and who offered alternatives have been brutally attacked including personal character assassination (Velikovsky, 1983). The profession is not ready to tolerate chronological dissidents.

In this section we shall examine— all too briefly— why some, including this writer, are very uncomfortable with the generally accepted chronology. The interested reader may pursue the arguments in the references of this article. Is it really possible as Jean de la Bruyere (1645-1696) said, that the exact contrary of what is generally believed is often the truth? And should we be content to receive and pass on a chronological system without question and without noting its many problems? The surest way to corrupt youth is to teach them to esteem more highly those who think alike than those who think differently. There seems to be a great deal of lockstep thinking in Biblical archaeology in speculative matters.

The Jericho excavations are an immensely complicated story, but briefly we can say that Garstang's earlier excavations were interpreted as support for the Scriptural account while Kenyon (1957, p. 266) came up with no support for the Biblical account:

At just the stage when archaeology should have linked with the written record, archaeology fails. This is regrettable. There is no question of the archaeology being needed to prove that the Bible is true, but it is needed as a help in interpretation to those older parts of the Old Testament which from the nature of their sources . . . cannot be read as a straightforward record.

I have two comments: The argument is— as most are— a chronological one, and it seems very safe to say that the conventional chronology is vulnerable in many ways. Second, I have personally heard one of Kenyon's students (now a world-recognized scholar in archaeology) openly scoff at Kenyon's highly subjective decisions during the Jericho excavations. Thus, the interpretation is not as conclusive as many writers would have us believe, but it fits very well into a humanist conception of the Jericho story.

Let us broaden this point. Field archaeology is more subjective than one might gather from reading most accounts of digs. J. Maxwell Miller (1982, p. 213) said recently, "There would be many different interpretations of a 5-meter square (the normal unit for excavating at a dig), if the director did not always have the final say in the excavation report." And consider comments such as the following:

a. William G. Dever (1983, p. 42)

. . . I decided that it was a disgraceful situation— a reflection on our much-vaunted modern methods— to allow a major, well-published city wall system (at Gezer) to remain in such dispute that authorities could vary by as much as twelve hundred years on the question of its date, not to mention its interpretation.

Dever says the great outer wall is Late Bronze Age; Kenyon dated the same wall to the Hellenistic period; Kempinski says Iron II. But the result, as Dever observes, is that after clearance of nearly the whole of a Palestinian site's city-wall system, together with its modern stratigraphic excavation, scholarly opinion as

to the date of the outer wall differs by more than a thousand years. Dever charges Kempinski was simply ignoring the overwhelming evidence. In that context, how can anyone be so positive about the Jericho dig?

b. William C. van Hattem (1981, p. 87):

I personally cannot free myself from the suspicion that the dating of some of Bab edh-dhra pottery (the supposed site of Sodom) was a result of wishful thinking rather than real fact finding. The "Cities of the Plain" *had* to be found in a certain era in a certain area . . . The weakness (of the argument) is not the biblical patriarchs, but the assumed chronology in which the archaeological facts are made to fit one way or another . . . We will have to be prepared to take account of new facts even when they challenge us to abandon established chronologies and widely accepted readings of history.

c. There is some interesting evidence that the long-revered sequence of Paleolithic-Mesolithic-Neolithic supposedly covering hundreds of thousands of years exists only in the minds of those who find it important to interpret the ancient world in uniformitarian terms. Although uniformitarianism has been discredited in the 1980s by leading evolutionists, the chronology based on those assumptions has achieved a life of its own. Clark (1980, p. 101) cites evidence to show that hunting/gathering (i.e., Paleolithic times) and settlement agriculture coexisted, that the Mesolithic in Europe had several Neolithic features, and that many so-called Neolithic societies in southwest Asia lacked some of the essential criteria for recognition as Neolithic.

In Wright's pioneer study of the period between the Chalcolithic and the Early Bronze Age, he distinguished three groups of pottery—each supposedly dominant for a lengthy period of time in turn. Since that time, it has been shown that these groups of pottery, at least in part, are contemporary. This concurrence of the pottery groups in Palestine, and the attempts to use them also as chronological indicators have caused great confusion since each of five authorities has employed a different method of interpreting the archaeological data (Yassine, 1985, p. 68).

Referring to the analysis of finds in Mycenaean shaft tombs, Dayton (1978, p. 238) commented: "The important point is that all styles exist side by side in time. Archaeologists have been too ready to give time-spans to different varieties of pottery and assume that one must succeed the other." No doubt this statement is too strong, but a great deal more attention ought to be given to the assumptions underlying pottery dating, to the validity of its dating, and to the supposed anchor points on which it rests.

d. It is not unusual to find statements such as the following: In 1973 Beno Rothenberg surveyed a settlement in the Sinai which he dated to the Proto-dynastic period (late Chalcolithic - Early Bronze Age I), but the site may, in fact, belong to the Middle Bronze I period, a difference of a thousand years or more, according to Cohen (1980, p. 77).

e. The Negev wilderness south of Judah played an important role in the time of David, Solomon, and the kings of Judah. Eminent archaeologists have analyzed supposedly the same pottery as follows: Rothenberg (13th century B.C. or earlier); Aharoni (11th century

B.C.); Cohen (clearly 10th century B.C.); Glueck, who first surveyed the area (between 10th and 7th centuries B.C.). C14 tests in 1980 tended to support Glueck (Danielius, 1975, p. 11). One prominent archaeologist privately intimated that another had planted or salted the site with pottery sherds that would support his own dating.

f. Miller (1980, p. 133) believes there are good reasons to doubt the arguments advanced by Albright and others for dating the Exodus/Conquest during the 13th century B.C. He believes that Bimson presents a thorough and fair analysis of the matter, and concludes that those who hold to a 13th century B.C. date have no monopoly on the archaeological evidence. This is an important point because Kitchen who is universally respected for his sound scholarship in Biblical archaeology, and who holds a conservative view of Scripture, has accepted the late Exodus date. But despite all Kitchen's painstaking and monumental work in Biblical archaeology, James (1981, p. 69) states that his efforts are hardly above criticism. For example, one of the key fixed dates for the late Exodus date is now known to be based on a mistranslation of an Assyrian text. Horn (1977, p. 24) suggests that:

It is high time that another detailed and penetrating study on the date of the Exodus were written, for no serious monograph on this subject has been published since J. W. Jack's now outdated work appeared in 1925.

Henige (1986, p. 57) sums it all up nicely:

Paradoxical though it seem, there is probably more argument about both the details and the broader aspects of ancient Near East chronology today than there was 50 years ago, when the paucity of data itself encouraged a more comforting degree of certitude.

All the assurance in the world as we read the literature, and there is arrogance as well, does not conceal the fact that ancient chronology is a highly speculative business. No one has developed a decisive system as yet, but we can one day expect a key discovery or reinterpretation that will resolve many of the present uncertainties. That will be a welcome day.

Finds and Illuminations

This paper is not the place to attempt to list and describe many hundreds of finds and inscriptions that marvelously illuminate the Scriptures. Instead we comment on recent evaluations of current Biblical study materials which include sections on archaeological finds.

Moyer and Matthews (1985 and 1985a) have published evaluations of the use and abuse of Biblical archaeology in current Bible dictionaries. As we might anticipate, they have sorted those volumes according to mainstream (which we have termed humanistic) and conservative orientations. They have provided a much needed service by identifying those which are badly out of date. The winner from a balanced conservative approach is Douglas (ed), *New Bible Dictionary* (1982), also available in a beautiful color-illustrated version in three volumes.

One conservative Christian archaeologist is considered to be one of the top scholars in the world, highly respected by all viewpoints: Kenneth A. Kitchen

(1977). He is must reading for any conservative Christians interested in Biblical archaeology.

Besides the above evaluations, several examples of interesting recent finds are discussed.

(1) Bab edh-Drah is located on the southeastern coast of the Dead Sea in the approximate area where Sodom and Gomorrah once stood. We leave the question as to whether or not the first of these sites was actually Sodom and focus instead on the findings of two paleobotanists. In two seasons of collecting and sorting plant remains, David McCrery (1978) found remains of these crops at the site: Wheat and barley, dates, wild plums, peaches, flax, grapes, figs, pistachio nuts, almonds, olives, pine nuts, lentils, chick peas, pumpkins, watermelon, and castor-oil plant, that is the evidence. Interpretation heads in two opposite directions. The conservative Christian points to Gen. 13:10: The land well-watered everywhere, before the Lord destroyed Sodom and Gomorrah, even as the garden of the Lord. The humanist looks for signs of irrigation.

Another interesting development occurred several years later in the early 1980s. Shea (1983) analyzed two Ebla tablets which listed almost 600 ancient place names including many in Israel and Jordan. The tablets are dated back at least several centuries before the destruction of Sodom and show the routes taken by a traveller of that time. Shea notes that Sodom, before its destruction, was one of the places visited, and that linguistically it is identical to the Biblical city of that name. Of special interest is the fact that the place names listed on the tablet just before and after Sodom are now geographically impossible for a modern traveller. The route passes through some of the most devastated land in all the world, and the route taken to the north of Sodom is now completely blocked by a rugged range of sawtooth mountains. When the land was "like the garden of the Lord", travel would have been easy. The tablet supports the conclusion that the land in that region changed radically at the time of the destruction. This should not be surprising, however, since in Genesis we may paraphrase the earliest mentions of the Dead Sea as the "sea where the plain used to be". Similarly, Josephus noted as a matter of fact that the Dead Sea did not exist before the destruction of Sodom.

(2) The work of specialists on ancient agriculture and animal domestication is very illuminating despite full commitment to the evolutionary framework for explanation. Consider these comments taken *passim* from Reed (1977) in *Origins of Agriculture*: Despite a lack of consensus we are left with the Near East as offering the clearest picture of a history of continuing cultural change culminating in the cultivation of plants and the domestication of animals. If village life is to be correlated with an increase in population as I believe we must accept, then the arc of hills from western Iran through northern Iraq, and southwestern Turkey, down through Palestine and western Jordan almost to the Red Sea was sprouting villages. In each such village a group would depart and found a new village. Whatever the factors, plant agriculture did arrive in the Near East, and with such a rush and such a rapid spread that we are amazed.

To the creationist the above statements are an almost perfect description of the spread of civilization to the

south and west of the mountains of Ararat during the first centuries after the Flood. The arc of villages described by Reed are just where we would expect them to be from the Biblical account and from the geography of that region.

In poring over the studies of Reed and other specialists, the creationist finds nothing at all in the evidence that is out of character with the description of the early post-flood world, except of course the conventional dating. But Reed, an ardent evolutionist, speaks of C14 irresponsibility even though he strongly disapproves of creationists taking note of that comment. Reed (1977, p. 896) concluded:

Of the various areas of the world considered in some detail by (leading specialists), the emerging pattern of agricultural beginnings for the Near East seems to me to be clearer than is that for any other area.

(3) No ancient tablet in all the world is more famous than Tablet XI, Gilgamesh Epic, because in all sincerity it is believed by many humanists since the 1870s to be the original version from which the Genesis story of the Flood was later formed. Literally thousands of books have picked up and retold this belief. The tablet does not tell about a flood at all, and the story got its start on the basis of a mistranslation. The reference to the birds in the tablet cannot have any relationship at all with the Flood account. The vessel is not an ark, and the date of the tablet is centuries later than even the most radical late dating of Genesis. This gross error has been known for more than a century, but the story goes on and on as a monument to careless scholarship, and it is routinely referred to today as solid evidence that Genesis is a late collection of myths. (Rapaport, 1986, p. 57).

Problems and Projects

(1) Chronology. From the previous discussion we can conclude that when a site is interpreted where chronology is a key factor, for example, Jericho, the issues are hardly settled as many interpreters would have us believe. The complexities are enormous, the stones are silent, and we may never reach a point where a compelling solution can be stated.

A brief summary of the chronological debate may be found in Stiebing (1985). Creationists ought to encourage the responsible study of chronological problems. The final answers are not as yet in for this immensely complicated problem of dating the ancient world. To a large extent we must play a waiting game and hope that in future excavations some incontrovertible synchronism will be found that will put at rest the present uncertainty about dating the Exodus and other issues. One conclusion seems safe. No side or faction has yet to come up with a satisfactory solution to dating the Biblical world before 1000 B.C., and the challenge lies there waiting for a person of considerable genius to put all the pieces together.

We say this despite the fact that interpreters such as Williams (1981, p. 70-71) state from the humanist perspective that conservatives are overlooking "easily available evidence." This is reason enough to encourage qualified persons to accept such a challenge to examine such "evidence" and its interpretation.

(2) In reading or writing about Biblical archaeology all must do a much better job of distinguishing between evidence and its interpretation. No one writes without assumptions about the ancient world, and currently these assumptions for the most part form two syndromes tagged at various times as scholarly, scientific, mainstream, liberal, humanistic on the one hand and as biblicist, fundamentalist, and conservative on the other. The latest pair of labels in Biblical archaeology—mainstream vs. conservative—is a hopeful sign that strongly held differing viewpoints need not be characterized by name-calling.

(3) Conservative Christians ought to invest in Biblical archaeology, and many more ought to qualify themselves for serious work in field archaeology and in the ancient languages of the Biblical world. G. Ernest Wright's comment is as true now as a generation ago that money from pious, conservative, or fundamentalist sources has never played a very important role in archaeology. The major excavations have been sponsored by sources dominated by a broad humanistic interest (Schoville, 1978, p. 97). As we have noted before, humanists look at the evidence through glasses colored by humanistic presuppositions. This view of the ancient Biblical world has led to the kind of excesses and sterile explanations described by van Hattem (1980, pp. 91-2) as continuing along outworn paths, and explaining away new facts which have come to light; as material left to the side, uninterpreted, and by and large, ignored; as using an assumed chronology in which the archaeological facts are made to fit one way or another; as resorting to name-calling instead of the use of evidence; as a refusal to accept new facts because they challenge scholars to abandon comfortably held but false chronologies and widely accepted but erroneous readings of history.

(4) It is not at all difficult to make a large collection of embarrassing misinterpretations by "mainstream" archaeologists, but the same is true of "conservatives." This is reason enough to strongly encourage qualified persons to become active in archaeology.

About a decade ago William Corliss (1978) began a widely heralded systematic collection of anomalies and errors in various branches of the sciences, some of which deal with the ancient past, such as geology, paleontology, ancient history, astronomy, and some aspects of archaeology. A similar project for the systematic examination of the literature of Biblical archaeology, and including ancient chronology, would be both interesting and useful. This could be an excellent means of distinguishing between evidence and interpretation. We see a small beginning of this idea now and then in articles reflecting on the field of Biblical archaeology. Rainey (1982, p. 217) includes a section on "some recent howlers" in his discussion of historical geography and archaeology. He illustrates how the most eminent scholars can easily go gloriously wrong in their interpretations.

Several illustrations of recent errors or questionable interpretations will suffice to illustrate the point. Inscriptions excitedly accepted as Philistine writing by some of the world's leading authorities on ancient inscriptions turned out in the early 1980s to be a most amateurish fraud. (Anon., 1984, p. 66-72).

Archaeologists who wanted to identify ancient sites with the city of Sodom and the other cities of the plain

were willing to close an eye on destructions dated a hundred years apart by saying they were destroyed "virtually" in the same period so as to fit the Biblical account (van Hattem, 1981, p. 88). Yet on other questions scholars will fight bloody battles in the journals over a one-year difference in dating.

Conclusions

It is very unfortunate that we must assume that otherwise intelligent persons will devote enormous energy to explaining away what is unacceptable to their belief system. Man has not changed from the days of Pentecost when scoffers were confronted by the miracle of unlearned apostles speaking in foreign tongues. Their conclusion was that the apostles were filled with new wine. We must assume and have noted that Biblical archaeology is often used to explain away the Scriptures without informing the reader where the evidence has left off and speculation has begun.

And where does all this discussion leave us? Biblical archaeology, combined with the geography of the land, is a wonderful treasure house of illumination for us of the setting of the Scriptures. It enables us to picture Old and New Testament events, helps us understand many things we cannot derive from the text alone. But that is not all of it. Mendenhall (1974, p. 4) quite properly states that "unless Biblical history is to be relegated to the domain of unreality and myth, the Biblical and the archaeological must be correlated." If he means archaeological "evidence" rather than mere speculation, he is correct. While we do not run around trying to prove the Bible, yet we have a certain quiet expectation—quite opposite to that of the humanist. We anticipate that archaeological finds that are unambiguous will be in harmony with the Scriptural account, and the list of just such finds is a very long one.

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CREATION RESEARCH SOCIETY STUDIES ON PRECAMBRIAN POLLEN: PART I - A REVIEW

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Abstract

In the last 20 years considerable interest has centered on a 1966 *Creation Research Society Quarterly* (CRSQ) paper in which C. L. Burdick presented photographs and descriptions of pollen grains isolated from Precambrian Hakatai shale and various other strata of the Grand Canyon, Arizona. Burdick produced this paper based on research he conducted at the University of Arizona. He relied as well on assistance from W. E. Lammerts in manuscript preparation. In defense of the macroevolutionary origins model, some workers immediately argued that these discoveries were merely contaminant modern pollen grains and not true microfossils.

At the prompting of the CRS Board of Directors, C. L. Burdick solicited the help of A. V. Chadwick, a creationist, to undertake further analysis of new rock samples from the Grand Canyon. At that time, Chadwick was associated with Loma Linda University, Loma Linda, CA. Based on this work, Burdick reported in a short article (1972) that the first discoveries had been replicated by utilizing essentially the same methods as he had originally used at the University of Arizona. While not altogether denying the 1972 pollen discoveries in Hakatai shale, A. V. Chadwick in 1973 wrote in a letter for publication in CRSQ that a more careful analysis of these rocks would be necessary before definitive statements could be made about the presence of microfossils in Grand Canyon strata.

Eight years later (1981) Chadwick, in a brief paper, indicated that by taking unusual precaution in field and laboratory to avoid contamination, and by using a different extraction procedure involving hydrofluoric acid (as well as hydrochloric acid), he had been unable to recover any pollen grains from samples of Hakatai shale.

Since contamination of the rock in the field and on the microscope slides in the laboratory is the usual claim of both creationists and evolutionists who discount the Burdick discoveries, W. E. Lammerts volunteered to determine just how easy or difficult it might be to recover contaminant pollen grains in nature. At about the same time, in Spring, 1983, the CRS Research Committee authorized E. L. Williams, G. F. Howe, G. T. Matzko, and W. E. Lammerts to collect new rock samples and perform pollen extraction by the old Burdick method to see if perhaps the differences in chemical processing between Burdick's method and Chadwick's would influence the final results. We recovered what are apparently pollen grains and other cellular objects from Hakatai shale by using the Burdick techniques. The methods, results, and conclusions of these recent studies will be presented in Parts II and III of this present series of papers.

Introduction

Finding a fossil land plant pollen grain in rocks labeled "Precambrian" is about as likely (in the uni-

formitarian macroevolutionary scheme of origins) as it would be to find a modern human skull embedded conformably in Mississippian coal layers! Evolutionary scientists have characteristically assumed that early land plants arose from the algae in the Silurian "time" while conifers and flowering plants are not supposed to have made their debut until the Permian and Cretaceous respectively. Thus even the very simplest (non-

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flowering, non-seed-bearing) vascular land plants are believed to have evolved millions of years *after* the Precambrian and Cambrian. Yet creationists and others have reported the presence of fossil pollen from various land plants in layers designated Cambrian and even Precambrian by orthodox historical geologists—see Rusch (1982), Burdick (1974 and 1975), and Chadwick (1981). A review and a history of creationist findings in Precambrian palynology is presented here-with.

Burdick Beginnings

In 1964 and 1965 C. L. Burdick, together with members of the Department of Geochronology of The University of Arizona, Tucson, did an analysis of microfossils recovered from rocks of the Petrified Forest, Arizona and collected by Gerhard Kremp of that same department (Burdick 1966, p. 38 and 1972, p. 25). Concerning this study, Burdick reported that “We had especially good results with fine microphotographs of many species of Chinle formation conifers” (1972, p. 25). Kremp, according to Burdick, had likewise secured rock samples from various other strata of the Grand Canyon, Arizona. These were also macerated and while examining the extracts, Burdick surprisingly recovered spores of various land plants from late Precambrian Hakatai shale (Burdick - 9/25/65)!* In that same letter to Lammerts, Burdick noted opposition to his pollen discovery from various unnamed sources but he also named two instructors who defended his technique, one of whom was Kremp who had done the sample collecting and at this time still evidently resisted the idea that he might himself have contaminated the samples in the field or that they might have been contaminated by Burdick at the University of Arizona Geochronometry Laboratory using his (Kremp’s) own standardized techniques (Burdick 9/25/65 and 1/5/66).

But departmental support for Burdick’s claims was short-lived and vacillating. Burdick wrote to Lammerts that Kremp’s reactions were “mercurial”—“. . . one day he is as enthusiastic as a kid over a project, next day lukewarm” (Burdick 1/26/65). Upon seeing one strange spore on a maceration that Burdick had prepared, Kremp (according to Burdick) wanted Burdick to continue the work and give a paper at the April meetings (1966) of the Arizona Academy of Science at Tempe. About this co-authored report, Burdick wrote in (2/4/66): “I doubt he will let me give a paper at Arizona Academy of Science. He does not want to be a target for derision.” And as it turned out, of course, Burdick was never authorized to deliver the paper.

Possible Contamination or Sample Switching in Field or Laboratory?

At this stage of the work it was Burdick more than Lammerts who expressed concern for avoiding contamination and who was cautious to take steps avoiding the same. Relative to possible contamination, Burdick wrote (2/4/66): “Dr. Kremp made me use special techniques to avoid that but still I get the same stuff—they are not contamination!!!” On 2/11/66 he wrote:

*In this reference and others to follow, a particular letter from Burdick to Lammerts or from Lammerts to Burdick will be listed together with the date of the letter. This correspondence is presently in the possession of the Howe and all quotations from it are used by permission of the writers.

“. . . in cases where the rock was shattered in sampling, Dr. Kremp put them through washings to remove contaminants. But after washings I got essentially the same type of fossil spore.

In further reflection on the possibility that he may have contaminated the samples in the lab, Burdick cogently noted: that he had “. . . completed two years at this sort of thing and could not be considered a novice” (2/4/66).

In some of this same correspondence, from time to time Lammerts quizzed Burdick concerning the possibility that rock samples might have been inadvertently switched. “(I) . . . wonder if Dr. Kremp might possibly have gotten his sample switched with one from Petrified Forest!” (9/16/65) Relative to both sample switching and possible contamination, Burdick wrote Lammerts back on (9/25/65) as follows:

Regarding your suggestion that there might be a mixing of samples, that possibly the assumed Hakatai shale sample might be confused with Petrified Forest sample, not a chance. The samples were taken on different expeditions three months apart. Furthermore, the color of the rock is different. The Petrified Forest samples came from grey rock, while the Hakatai rock is red. Dr. Kremp discounts the possibility of contamination. He is very careful in sampling.

Believing that his instructor’s original Hakatai sample was too small, Burdick returned two more times to Grand Canyon—once accompanied by H. Slusher. Burdick described his own field techniques and impressions of the Hakatai collecting area fairly plainly, as follows:

. . . the area for getting the samples along the Hakatai trail was small. The trail is usually within ten feet or so of the vertical bank . . . In rare cases the ground may be flat or low so one could pry up a slab as was done in the one Dr. Kremp brought back. The others had to be picked out of the solid rock wall, so a slab was quite out of the question. The surface of the rock was usually weathered, so we dug back a few inches to get a fresh sample. I did not see or sample in places where roots had opened up seams. Mineral laden water carrying iron does penetrate the rocks to a certain distance, but the spores of 50 microns I would think would be too big to penetrate the solid lattices of the mineral (2/11/66).

Which Strata Finally Yielded Pollen?

At first (1/5/66) Burdick indicated that he had found spores and pollen in Hakatai shale (Precambrian) but did not originally find a single conifer grain in all the other rock formations he tested including: Tapeats sandstone (Cambrian), Bright Angel Shale (Cambrian), Muav (Cambrian), Redwall limestone (Mississippian), Supai (Permian), Hermit shale (Permian), and Bass limestone (Precambrian). When he thought of the possibility that the Hakatai discoveries might have been contamination by modern non-fossil pollen, Burdick asked a valid question: If they are contamination why should they all be concentrated in the Hakatai? (1/5/66). Further along in the same letter Burdick noted that if contamination was present, such modern grains would be nearly colorless while all of the conifer

spores he had recovered were of reddish color-supporting their *ancient* character. Even from a creationist perspective (1/26/66) Burdick wondered why there would be so many pollen grains in the Hakatai Precambrian and seemingly few or none in the other strata.

But the picture changed when Burdick noted on 2/4/66 that he had recently macerated a sample from Supai (Permian) which was: . . . just lousy with all kinds of plant life, conifers, polyplicate, disulcate and other kinds of angiosperms. He added that he had also recovered spores from Redwall limestone and Bright Angel shale. In the face of this unexpected turn in his studies, Burdick wrote as follows:

When you get some 60 slides made from Supai samples with no spores of any kind, then suddenly with the same technique get a swarm of all kinds of spores including fifteen or twenty conifer, logic and even common sense will tell you they cant all be contamination. But it does tell me that the fossil spores were not evenly distributed throughout the sediments. There were great barren areas, then concentrations in spots . . . I am using the same technique as I used so successfully a year or so ago in the Petrified Forest. I would have a long series of discouraging blanks, then all of a sudden a whole swarm of conifers of all types . . . I never heard a suggestion then of contamination, I guess because mostly I found Triassic types of trees in Chinle. My point is that some of these blanks, according to the law of averages should show up contaminations instead of all of them being concentrated in the one sample, when the technique was the same (2/11/66).

The Lammerts Connection

Perhaps it has been obvious up to this point but well worth noting anyway that W. E. Lammerts (CRSQ editor at that time) lent encouragement from the very early stages of Burdick's important study to the time of its publication in CRSQ, June, 1966. Upon learning of the research, Lammerts solicited a paper and at times even coaxed Burdick to complete the laboratory work and send a manuscript.

Burdick delayed at first because he felt the original Hakatai sample collected by the University of Arizona instructor was too small (9/25/65). Later, he was concerned about possible contamination while Lammerts puzzled over possible sample switching. Such concerns seem to have vanished by January, 1966, as Burdick had located spores in newly collected Grand Canyon rocks:

Well, I am far enough along to assure you that the job will be a success, and I have now corroborated the existence of disaccate pollen (conifers) in the Hakatai shale. Samples taken from three separate locations in the Hakatai formation show up the same type of pine spore as the original one; that makes four locations in all. I dont know what more in the way of evidence is needed (1/5/66).

Burdick had come to realize by this time that he would have to produce a paper without the support of his instructor:

for a while he (Kremp) readily admitted that the one we got before could not have been a contami-

nation; and he was right. But now he says it was a contamination. Another fellow got the same type of spore or pollen from the Devonian in the Salt River Canyon. That hurts the evolutionary sequence too. What he will say when I take the microphotographs I dont know but it is preposterous to say they are all contamination (1/5/66).

Yet Burdick still tried to avoid what might have appeared to be possible conflict of interest and as a result he and Lammerts decided to limit the published data to slides from samples Burdick had personally collected:

I dont blame you for being upset due to the sudden change due to Dr. Kremp's objection to publication . . . your suggestion or a compromise is a good one, that we will now publish only the results from the samples that Slusher and I took . . . If we dont publish the results from samples that Kremp and his helpers took, then he can have no real cause for complaint (2/21/66).

Lammerts' continuing role in manuscript preparation is evident in this comment of Burdick's (2/21/66):

Since you did not return the manuscript I sent you with the introduction and maceration procedure, I will not repeat that phase, but if you wish you can pick out any parts you may care to use. All I will send now is the summary of results with description of spores and locations and photos. Perhaps you can fit together.

Finally after Burdick's instructor at the University of Arizona failed to answer a letter of inquiry sent by Lammerts, Lammerts called him by phone whereupon the man indicated that he considered Burdick's claim of having found pollen grains in Hakatai shale to be ridiculous.

CRSQ in The Vanguard

Here, a word should be written as well about the importance of CRSQ to the scientific world in general. Aside from whether or not Burdick's work was repeatable and aside from the cry of contamination, a radical discovery such as this certainly deserved a hearing. Had it not been accepted for publication in CRSQ, it is extremely doubtful that the editors of any other peer-reviewed, scientific journal would have printed these results. If Burdick had sent the paper to some Christian magazine instead, it is probable that evolutionary scientists would have sneered even more—further discounting his work for having been published in a "religious" journal.

What Was The Source of Pollen for Precambrian Shale?

During this correspondence Lammerts and Burdick periodically discussed the problem of how, even from a creationist point of view, one might have expected pollen to be deposited in Precambrian rocks anyway. While some creationists like B. Northrup and W. G. Peters have assumed that Precambrian strata were formed in the early stages of creation—when plants had been created but not animals—it is apparent from their correspondence that Lammerts and Burdick, were agreed on the idea that Hakatai shale was formed during the Flood event itself. Accordingly, Lammerts proposed the following to Burdick on 1/16/66:

Incidentally though you will think it a bold theory, could not the source of pollen have been the pines of the petrified forest, the wind blowing the spores into the Hakatai shale as it was being formed. We must remember that from our viewpoint all these were alive at the same time. Or were there nearer sources of pine forests as shown by the geological record?

On 1/26/66 Burdick agreed to this proposition and Lammerts on 2/1/66 added the following insights:

... pollen is windblown and evidently the forest was still standing at the time the Hakatai was being deposited. Then the Flood evidently overwhelmed this forest and naturally after that there would be no source of pollen supply. Let us remember that even from our point of view there is some time sequence, though it is a matter of days or at most months. In fact we may draw some remarkable inferences as to the mechanics of the Flood . . . One is that while formations were being deposited in one area, forests and presumable life in them (at nearby areas) were not completely annihilated as yet. Studies such as these should eventually allow us to picture more vividly just how the Flood progressed in its destructive paths.

Enter Dr. MacGinitie

In the fall of 1964 Lammerts enrolled at the University of California (Berkeley) in a paleobotany course which at that time was taught by the well-known and widely-respected micropaleobotanist H. D. MacGinitie. Lammerts and MacGinitie had many long conversations about paleobotany in relation to evolution. Thus in either late 1965 or early 1966, when concerned about possible contamination, Lammerts showed some of Burdick's pollen slides and pictures to MacGinitie. The latter, after carefully examining the Hakatai material, affirmed without hesitation that some of them were gymnosperm pollen grains. MacGinitie further expressed interest in the unusual nature of the pollen grains and spores, saying that they were quite unlike any from plants now growing on Grand Canyon walls. Although Lammerts told MacGinitie the material came from Grand Canyon, he did not disclose the fact that these were samples from Precambrian Hakatai shale.

The reactions of MacGinitie stand in strange contrast to the assessment of A. V. Chadwick who (1981, pp. 9-11) asserted that the poor quality of Burdick's photographs made them difficult to identify but that even so, "Burdick's grains approximate the modern pollen grain found in surface samples in the area of the Grand Canyon where he collected samples." In Lammerts' opinion, Chadwick's assessment of poor quality in Burdick's 1966 photographs was essentially correct. Lammerts remembers that Burdick's slides themselves did show much more detail and variety of pollen grains than is evident in the 1966 photographs. Thus MacGinitie was puzzled as to just where in the Grand Canyon Burdick could have found such a complex of spores and pollen grains as was manifest on the slides.

With problems such as these seemingly settled, Lammerts made the Burdick paper a part of the June 1966 Quarterly.

Repetition Attempted at the University of Arizona— 1970

The Creation Research Society sponsored an attempt to repeat the Burdick study and encouraged a corollary project sponsored by Loma Linda University of California (Burdick— 1972, p. 25). Burdick, accompanied by D. Delevan, geologist from the University of Arizona, returned to Grand Canyon in June, 1970, to collect the fresh rock samples. Concerning their technique, Burdick wrote that:

These were from fresh unweathered exposures and immediately sealed in sterile plastic bags. Samples were also taken from the shaley layers in the Mississippian Redwall formation. Further samples were cut from Cambrian formations, chiefly the Bright Angel shale. Getting down into the Precambrian, the Proterozoic, samples were taken from the Hakatai shale and the bass limestone (Burdick, 1972, p. 26).

Two workers who did not go on the collecting trip but were asked to analyze the samples make the following report in *Geotimes*:

The trip could not be made at that time so Burdick found someone to do the collecting and upon his return asked to have the samples extracted for pollen with safeguards against contamination. The extractions were done as requested. The results were total palynological sterility; i.e. no pollen grains or land plant spores of any kind were seen (Solomon and Morgan— 1973, p. 10).

Burdick attributed these negative 1970 results of Solomon and Morgan to problems with their processing of samples. He reported that:

... Mr. Delevan then turned the samples over to Mr. Morgan, a palynologist from the geochronology department of the University of Arizona for processing. Mr. Morgan used the acid technique, which has been the vogue in the past. When the spore residue was placed on slides and examined through the University microscopes, they were so clouded with undissolved rock salt that if spores were present they were completely obscured. Therefore, I would conclude that the University of Arizona phase of the investigation was inconclusive. However, sufficient samples were available for a repeat performance, but Mr. Morgan has been too busy to repeat the analyses (Burdick, 1972 p. 26).

Other comments by Burdick concerning this interesting phase of the repeat analysis include the following:

I would have had some definite results from the redoing of the Grand Canyon pollen had it not been that the graduate students under Dr. Kremp messed up the processing in the laboratory. They don't seem interested in re-doing the samples (2/25/71).

The University of Arizona messed up the samples they processed, so we have to depend on the Loma Linda samples (2/19/71).

Loma Linda University Was Also On The Scene - 1970-71

Burdick maintained (1972, p. 25) that on this same July 1970 tour, "Drs. Bullas and Arthur Chadwick of Loma Linda took rock samples and processed them in

their Loma Linda laboratories.” On page 26 Burdick added that:

The announced tour of Grand Canyon had been rather widely advertised by The Bible Science Association, and two scientists, Drs. Bullas and Arthur Chadwick, were sent along to also take samples, which they did from the same rocks where Mr. Delevan sampled. they too followed specific procedures to avoid contamination (1972, p. 26).

Correcting Burdick's assumption that Bullas was from Loma Linda University, Chadwick *et al.* reported that:

Dr. Burdick incorrectly implied in his paper that Dr. Leonard Bullas . . . was a part of the Loma Linda team . . . Aside from his assistance in the initial collection of Grand Canyon samples and continued interest he has not been associated in our palynological investigations (1973, p. 238).

Later, Chadwick recounted this collecting trip as follows.

In 1971, I obtained a collecting permit from the National Park Service and accompanied C. L. Burdick to the Grand Canyon. His previous sample localities were relocated and new samples were collected, returned to my laboratory at Loma Linda University and processed by C. L. Burdick using techniques similar to those he had employed in his earlier work at the University of Arizona (1981, p. 7).

In 1972 Burdick summarized the Loma Linda results as follows:

. . . readers will observe, the Loma Linda results largely follow the same pattern of the palynology investigation as performed by Burdick in 1964 and 1965, while doing research for the University of Arizona. If there is any divergence in results it would appear that Loma Linda secured a slightly greater proportion of Angiosperms (1972, p. 27).

In this 1972 paper Burdick published six photographs of pollen grains—some gymnosperms and some angiosperms reportedly taken by Chadwick and others at the Loma Linda laboratory.

Was Howe Hoodwinked In 1973?

The editor of CRSQ at that time, Howe, received, modified, and published the 1972 Burdick manuscript, assuming that it had come with the approval of the Loma Linda workers through their collaborator, C. L. Burdick. Howe was surprised later to receive communication from A. V. Chadwick *et al.* (1973, p. 238) that the Loma Linda workers “. . . were not contacted directly . . .” by Burdick as regards this manuscript and that it had been published with neither their knowledge nor approval. Howe decided thereafter to run closer checks on the source of data being published in CRSQ.

Who Actually Did The 1972 Research Chadwick *et al.* or Burdick or Both?

In comparing the 1973 disavowal of Burdick's 1972 paper by Chadwick *et al.* with the 1981 paper also penned by Chadwick, an apparent discrepancy arises regarding who actually performed the pollen extractions reported in Burdick's 1972 paper. Writing of this

1972 research in his 1981 report, Chadwick treated it as if it had been entirely Burdick's production:

. . . new samples were collected, returned to my laboratory at Loma Linda University and processed by C. L. Burdick using techniques similar to those he had employed in his earlier work at the University of Arizona (1981, p. 7) (Emphasis is mine not Chadwick's).

Evidently Chadwick had forgotten that back in his 1973 communication to CRSQ he had spoken of these same 1972 data as his own, avowing that Burdick had had little or no part in the analysis:

Aside from his assistance in the initial collection of Grand Canyon samples and continued interest *he has not been associated in our palynological investigations.* (1973, p. 238) (Emphasis mine not Chadwick's.)

We have thus far been unable to extract pollen or spores from the Hermit although the *Hakatai* has contained numerous well preserved palynomorphs some of which have been identifiable. That these may be contamination has not been ruled out. (1973, p. 238) (Emphasis mine, not Chadwick's.)

Thus in 1973 Chadwick and his coworkers were evidently discovering pollen from ancient rocks because they wrote in 1973, p. 238, that they had extracted “well preserved palynomorphs” from Hakatai shale and they were finding “anomalous pollen grains in Early Paleozoic sediments . . .” as well.

In 1981 Chadwick made no comment about his own out-of-place pollen grains. It is hoped that in some later publication Chadwick will describe and share pictures of his own 1973 palynomorphs from Precambrian strata, even if he feels they were contaminants.

Chadwick's Message in 1981

Chadwick clearly indicated in a short results section of his 1981 paper that:

A total of fifty samples from the same strata which Burdick had studied were processed. All slides were completely scanned. No single example of an authentic pollen grain was obtained from any of these samples. In fact, the slides produced from the Hakatai Formation were in most cases completely free from any material of biologic origin, modern or fossil (1981, p. 8).

He presented numerous reasons why Burdick's (1966 and 1972) pollen grain discoveries should be considered to be: “. . . modern contamination picked up either during collection and transportation or infiltrated into the sample itself prior to collection” (1981, p. 9). He maintained that Burdick's discoveries failed the test of reproducibility.

Rusch and Burdick Reply - 1982

While not necessarily defending the earlier Burdick discoveries, W. H. Rusch responded to Chadwick and to Solomon and Morgan by asserting that even if Burdick's findings could all be explained as modern contaminants, the fact still remained that various other workers had found such items as microspores and tracheids of vascular plants in the Cambrian (Rusch, 1973 and 1982). Burdick had also referred to these Cambrian findings in a 1975 Panorama of Science article and to workers who had located microfossils of

land plants in the Precambrian of Venezuela (1974).

In a final statement about the whole matter, Burdick drew attention to Chadwick's withdrawal from his (Chadwick's) own discoveries and apparent change of stance.

I saw slides of the work, which seemed to me to parallel the ones which I had obtained in Tucson. Later Chadwick seems to have changed his mind, and doubted that any ancient spores had actually been found; although I do not believe that all workers at Loma Linda share that view (1982, p. 144).

CRS Involvement

By Spring, 1983, the Research Committee decided that CRS had a major stake in this intriguing series of pollen papers! If, as Chadwick had asserted, reproducibility is a cardinal principle of the scientific method, then perhaps Chadwick's own negative results should be tested to see if they also are routinely reproducible. It was decided at the CRS meeting in April, 1983, that a wholesale reanalysis of both the Burdick and the Chadwick-Doher methods should be undertaken. E. L. Williams, G. F. Howe, and W. E. Lammerts agreed to collect samples at the Grand Canyon. Williams located a chemist, G. T. Matzko, who agreed to carry out the pollen extractions according to both procedures. G. F. Howe agreed to examine and photograph the resulting samples with a light microscope while Lammerts volunteered to carry out his own research on how likely it is that environmental pollen will contaminate microscope slide samples.

Although a brief mention of our findings has already appeared in CRSQ (Howe et al., 1986) the extensive results of these studies will be reported in two subsequent papers. It is hoped that this preliminary review will lay the foundation for later papers and perhaps challenge other workers—both creationists and evolutionists to go back to examine these supposedly ancient strata for the presence or absence of anomalous microfossils.

Acknowledgements

I thank Clifford L. Burdick for making the original discovery of spores in Precambrian Hakatai shale and other strata of Grand Canyon and thereby initiating this whole pattern of creationist interest in palynology. I am grateful, as well, to him and to Walter E. Lammerts for their permission to reproduce portions of their private correspondence. I appreciate the interest, encouragement, and financial support lent to these studies by members of the Research Committee of CRS. I also wish to acknowledge the contributions of many CRS members and friends to the Laboratory Project Fund—interest from which has covered some of the expenses involved in the investigations being reported in this series of papers. I thank Phyllis Hughes for assistance in preparation of the manuscript.

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DILUVIOLOGY AND UNIFORMITARIAN GEOLOGY—A REVIEW

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Abstract

Interpretation of the fossil record from Flood and uniformitarian geology are compared. The different approaches of Morton and Woodmorappe to Flood geology are considered. The Flood model is superior to the uniformitarian model. Likewise the fossil record does not support any long-age concept.

Introduction

When carefully considered in the light of questionable assumptions and practices engaged in by many historical geologists, the fossil "succession" can be very reasonably harmonized with modern diluviological concepts, even though much work remains for creationist geologists. Over the past few years there has been considerable discussion and controversy on the subject of Flood geology versus uniformitarian geology, and the fossil "succession" in the pages of *CRSQ*.

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The main proponents involved have been Morton (1982, 1983, 1984) and Woodmorappe (1978, 1980, 1981, 1982, 1983a, 1983b, 1985).

The controversy boils down to one basic argument—does the fossil record accord more with the short duration, non-evolutionary Flood geology theory, or with the historical geology theory involving long time periods and evolution? I would like to examine features which can be used to support or detract from either, but firstly we must establish the differentiations involved in both Flood and uniformitarian geology, and the questions of superficial or detailed support of the competing models.

Competing Viewpoints

In the Flood model there is only one *main* theme; the short term Flood of Noah and its aftermaths (up to 2000 or more years thereafter). In the uniformitarian model there are two main views— (1) the gradual, non-catastrophic, long period deposition of sediments, and (2) the acceptance of some large-scale, but mainly localized, catastrophic events within a general uniformitarian frame-work. There is also a third view which should not be left out of the discussion; that is the acceptance by many creationists of general uniformitarian principles over immense ages but not of evolution itself. All three will be examined in detail below but I think it fair to say that whether one takes the evolutionist or creationist position, the fact is that geology, evolution and creationism are inextricably bound together. Only the strata and the fossil “succession” can really determine which model is most likely to be correct.

Objections to the Flood Model

Morton (1982) asserts that although the fossil succession is superficially supportive of the Whitcomb-Morris hydrodynamic sorting model, when one gets down to detail, the actual placement of the fossils in many ways contradicts the model. Morton points out that large trilobites of the Ordovician occur later (higher up) than smaller specimens of the Cambrian. He finds it hard to accept that we have virtually no fossils of humans or their implements such as plows, eating utensils etc. in the lower deposits. Even if most humans could escape to higher ground, and be buried late in the Flood, at least one would expect cultural tools and artifacts to be found much lower down the geologic “column.” He also mentions 25 dinosaur eggs of the Cretaceous which had apparently had time to hatch before the next deposition buried them. Another puzzle he refers to is the alleged lack of fossils in sandstones which he considers hard to accept if the Flood was of short duration.

Other problems were angular unconformities, partial erosion of pre-existing beds and the redeposition of the eroded material into younger beds; the presence of what look like single-celled organisms in the Precambrian; the presence of algal stromatolites in the Precambrian; and the world-wide break in the deposition of strata due to a universal period of erosion between the Precambrian and the Cambrian. Mr. Morton also finds a big problem in the Tertiary record, in that Noah could not have chosen to take on the Ark only those animals which would survive until the latter stages of the Flood. (Increase in percentage ratio of occurrence of fossilized extinct specimens to living species with each succeeding epoch). Nor is he overly impressed with the ecological pre-flood zonation postulate, and he also makes much of the alleged fact of the “first appearance” of various fossil taxa in the record. Morton proposes that it is possible that the violence of the Flood was so great that all evidences of humans and their civilizations were totally obliterated. The puzzle of the (possibly human) and dinosaur footprints in the Paluxy River, with underlying fossiliferous deposits several thousands of feet thick is also mentioned.

Objections to Orthodox Geology

Before examining John Woodmorappe's model (1978, 1980, 1981, 1982, 1983b) I would like to make

some comments on Mr. Morton's legitimate objections to the generalized Whitcomb / Morris Flood model, but before doing so, I would like to establish one thing. Although many students accept the reality of the geologic column, I must, for many reasons, seriously question its validity, reality and meaning:

- (a) Whether one is a Flood or orthodox geologist, we all must agree that *superficially* there is a “column” of sorts in a sense which agrees *broadly* with both uniformitarianism and diluviology. However, both viewpoints are beset with difficulties which require secondary hypotheses to rescue the primary hypothesis i.e. the uniformitarian must explain the many deceptive conformities and the lack of empirical evidence to support the assertion that “X” millions of years had separated the two adjacent conformable strata. The Flood geologist must find answers as to why there are thousands of feet of sedimentary deposits beneath the “human” and dinosaur footprints at Glen Rose, Texas. I believe a modified Flood theory (referred to below) requires less secondary hypotheses than the uniformitarian model, which requires many contortions in the *art* of world-wide fossil correlating.
- (b) My principal objection to the orthodox theory is that we are assured by mainstream geologists that in the two billion years from the early Archeozoic to the present, just about every square mile of the earth's surface has been subjected to countless contortions, uplifts, downwarps, depositions, erosions and various other tectonic activities of all violent kinds, over and over again. Mountain ranges have been uplifted and completely eroded away, not just once but many times over. Huge volcanic outbursts and earthquakes contributed to the frequent destruction of topographical features.

Gigantic overthrusts and tiltings have been frequent; huge forests buried to form enormous coal beds; many glaciations on vast scales; the continuous assaults by sun, wind and water etc; huge continents colliding with each other causing severe crustal buckling and mountain building etc. Also one might ask why the ancient strata, which once were allegedly the surface of the Earth for many millions of years do not show evidence of meteorite remains as do the more recent (Tertiary) deposits, if such immense time periods really existed.

In view of all these countless destructive activities, how is it that we find hundreds, nay thousands of locations all over the Earth where nicely formed, *undisturbed* sedimentary beds, many of them enormous in size, both vertically and in horizontal area, ranging back to two or more billion years ago, with their embedded fossils, quietly waiting all that time to be discovered by modern paleontologists? What amazing providence perfectly preserved all these sites and shielded them all from the destruction and tectonic activity going on supposedly all over the Earth?

Were all of these thousands of sedimentary fossil areas never once uplifted and eroded away or otherwise destroyed? One may believe this could be the case if the Earth was young but if the inconceivable ages of billions of years, or even scores of millions really existed, almost all of the Earth's surface

would have been subject to wholesale destruction by erosion and other agencies, with ubiquitous reworking and mixing—in other words, an almost unintelligible mess except for the last few thousand years. I know there are many cases of “reworking” of fossils and many anomalous fossils in the uniformitarian model, but nowhere near enough if the enormous time scales were valid. The shorter period diluviological model accounts far better for what we actually find in the rocks. No!—time is the *enemy* of historical geologists. The record only makes sense if the world’s strata were laid down fairly recently. E. C. Olson, Professor of Geology, University of Chicago, tells of the “repeated upheavals that have thrust up great mountain ranges, and raised continents above the sea” in his 1966 book, *The Evolution of Life* (p. 21). He goes on to say “Time and again, wind, water and ice have cut and destroyed the rocks that had been elevated to form continents.” He then speaks of the great erosional forces which denuded the continents of their covering rocks. After discussing fossilisation processes, Olson goes on to say—“That there is a fossil record at all seems rather remarkable.” (p. 35). To which I heartily agree.

- (c) The next virtually fatal problem for uniformitarian geology is the presence of thousands of cases of deceptive conformities (paraconformities) in the understrata involving both continental and marine deposits. These cases, some of them covering vast areas occur when two deposits, allegedly separated by many millions of years, lie smoothly together with not the slightest sign of erosion on the lower beds. I will let Sir Henry Howarth, a non-creationist geologist of 80 years ago, eloquently describe his thoughts on paraconformities in his 1905 work *Ice or Water* (pp. 330-1):

The *absence* of the erosive agency of water, as manifested in cutting valleys and gorges in the under strata of the earth, is *fatal* to the theory that each formation has successively emerged from the sea and become the surface of the habitable world . . . What we want to see is a plain instance of valleys excavated and mountains formed in the ancient strata of the earth as we find them existing in the present day . . . until then we take leave to reject the theory . . . the parallelisms of the beds *over large regions* of the earth stands in complete opposition (to the notion that the under strata had ever been the surface of the earth for indefinite periods).

[Also quoted by Nelson, (1968 p. 150)] George McCready Price, as quoted by Daly, (1972 p. 213-15) commented:

Nature must have served an injunction on the action of the elements . . . for millions of ages, the water neither wearing away nor building up over any part of this taboo ground during all this time.

Daly also quotes Twenhofel who admitted that:

an unconformity separating the oldest Precambrian from the latest Pleistocene may have the same physical appearance as one between the latest Pleistocene and the middle Pleistocene. The fossils of the strata bounding an unconformity are the *only indicators* of time value. . . .

(Also quoted by Whitcomb and Morris, p. 207) W. R. Corliss, a non-creationist researcher also commented on paraconformities in his massive 1980 source book (p. 219):

The strata on either side of the unconformities are perfectly parallel and show no evidence of erosion. Did millions of years fly by with no discernible effect? A possible though controversial inference is that our geological clocks and *stratigraphic concepts* need working on.

I also saw good examples of the parallelisms of the under strata when I inspected the Grand Canyon in March 1983. The National Park ranger, who had an excellent knowledge of geology, admitted that as far as he knew, there was no orthodox solution to the problems of paraconformities, under strata parallelisms, nor for that matter, the mystery of the missing “ages” in the Canyon. (The Silurian and the Pennsylvanian and Ordovician.) A sign in the Information Center at Bright Angel on the south rim informs visitors that—“No known theory can account for the existence of the Grand Canyon.” A week’s study of the Grand Canyon should be a good cure for evolutionary geologists as it is a perfect example of Flood geology with its paraconformities and striking parallelisms of the under strata. The whole area was obviously laid down quickly, then uplifted and then the whole sedimentary area split open like a rotten watermelon. If there is erosion, then it took only five million years to wear down 500 “million” years of strata which themselves are erosion free! I do not need to belabor the point further. I will allow Daly (p. 214) to make the final comment, “. . . historical geology would be seen as it actually is, a record of events, most of which never took place, in time, much of which never existed.”

- (d) Another major problem for orthodox geology is the very large number of alleged overthrusts, many of them enormous in area, and most of them giving no indication whatever that such overthrust had indeed occurred *except* that the fossils are in the “wrong” order. Whitcomb and Morris (pp. 180-200) have adequately covered this subject and John G. Read (pp. 10-55) also had some strong comments on these alleged overthrusts. Although there are still many further severe problems for historical geology such as the inability to account adequately for incised meanders, geosynclines, peneplains etc., we only need to demonstrate just one genuine case of wrong order fossils, or a true paraconformity. Taken together the above three major objections are extremely serious if not fatal to evolutionary geology.

The matter of radiometric dating is another subject which has been adequately dealt with by highly qualified creationist and other scientists such as Slusher, Morris, Cook, Whitelaw, Gentry, Setterfield and Snelling, and I will be having more to say about it in a future article. Suffice it to say that given the questionable assumptions involved, there is no scientific way to *prove* the validity of any given radiometric date. Having established the relative youthfulness of the strata beyond reasonable doubt, we must look for another cause for the

existence of the fossils and the sedimentary rocks, and also examine the problems raised by Morton (1982).

Flood Geology Problems

Firstly, regarding possible time factor problems in the Flood model (one Flood year plus up to 2000 or more years of post Flood catastrophes as the earth sought to re-establish reasonable equilibrium), Morton points to the 25 dinosaur eggs of the Cretaceous, lying neatly with tops broken open indicating sufficient time was available for hatching before the next deposition. Now this event (a month or so?) obviously did not take place during the actual Flood. The key to the problem lies in the word "Cretaceous." For reasons which I will later discuss in more detail and in view of the extremely strong evidence given above for a young earth, the term "Cretaceous" as used by orthodox geologists to imply an immense time period is untenable. If the reader will bear with me for a while, I believe a strong case can be made for the dinosaur eggs event to be a post Flood situation involving a reasonably gentle deposition by inundation up to possibly 2000 or more years after the Flood, before the last dinosaurs became extinct.

The idea that man and dinosaur were contemporary is supported by (a) the (possibly human) and saurian footprints in the Paluxy River in "Cretaceous" rocks containing a small tree branch which was officially C14 dated at UCLA by Dr. Roger Barger as being only 12,800 years old (Beierle 1979 and Morris 1981 pp. 62-3) and (b) the very strong Biblical evidence contained in Job 41, which gives an excellent description of a dinosaur about 800-1000 BC (Mehlert 1983). In view of (a) and (b) above, may we not have reason to consider the possibility that terms such as "Cretaceous," "Silurian" etc., may be actually illusory in relation to time? It would seem that the "Cretaceous," at least in Texas, is certainly not 70 million years old.

With regard to the thick sedimentary layers beneath the Paluxy River site, John Morris (1981, pp. 177-85) has recognized problems for Flood geologists but noted that the area included what is called the Llano Uplift. he concludes it was one of the last areas to be *permanently* inundated by the Flood and the location of Glen Rose limestone tracks accurately outlines the fringes of the Llano Uplift itself. he states that it is quite possible that a few humans and dinosaurs could have survived the early onslaughts of the Flood and that conditions existed whereby the survivors left the Uplift only to find that the waters returned (after temporary lowering of the water levels (tidal flows?) leaving their footprints in the mud. Although Morris' comments deserve close consideration, I am more inclined to believe that the prints are post Flood, because of the two points I raised above (Beierle 1979, Mehlert 1983, Morris 1981, pp. 62-3). Final conclusions may have to await further research.

Woodmorappe (1981) says that "the successional liberties of the Jurassic and Cretaceous to . . . often not rest on the next oldest beds directly . . . may support the position that they are post Flood . . .". There is still some doubt as to whether part, most, or all the "Tertiary" is post Flood, however the question of relationship of percentages of Tertiary fossils as compared with extant *species* may be resolved in the question-

able reality of the "Eocene," "Miocene" etc., (see below for further discussion) and also the use of the difficult-to-define terms "species" or "genus." I doubt very much whether anyone, be they creationist or evolutionist can ever accurately and objectively define a species or a genus. In any case, Woodmorappe (1983b) has nicely covered the problem which I find quite convincing. In fact, the problem can be neatly turned against the evolutionist—among all the millions of fossils found, only one-quarter million species are represented compared to about 1.25 million extant species. This fits well with short-term Flood geology but over 600 alleged million years of evolution, the number of species which thrived in all that time must have run into many millions. Where are all the millions of other species in the rocks? Occam's Razor favors the short term diluviology approach.

The problem of the heavier and larger Ordovician trilobites being found higher than the smaller Cambrian specimens may be indeed due to the fact that often, there was superior ability to move away from the disaster area as Woodmorappe (1983a) states. Although unlikely, there is also the possibility that some of the larger "Ordovician" specimens were entombed in the "Cambrian" but have not yet been found. Who knows for certain? Anyway it is always guided by questionable co-relation methods i.e. if the larger specimens are found, they would probably be classified as "Ordovician." My own views on fossil separation are reasonably consistent with the model propounded by Woodmorappe (1983b) whose treatise would be closely examined by the reader.

Fossil Succession and Separation

Factors which must be considered when looking at the question of fossil succession are examined in considerable detail by Woodmorappe (1983b) and briefly are listed below, including some of my own and others' ideas. Some of these factors would work together to bring about what we see in the fossil record and these possible *combinations must not be overlooked* in our examination of the evidence.

(1) Hydrodynamic sorting; (2) ecological zonation; (3) preservation bias (large or small population; hard or soft parts etc.); (4) differential escape; (5) degree of intelligence; (6) degree of mobility; (7) biogeographical zonation; (8) tectonics; (9) elevation (both land and marine); (10) too much taxonomic hair-splitting (which could include confusing lateral variation within a kind with vertical evolution); (11) climatic differences; (12) lack of certainty as to exact time-range of fossil forms; (13) chance; (14) unconscious bias by the paleontologist when assigning a fossil to a particular epoch or age (stratum), because he is completely unable to think of fossils in any other way than in the evolutionary sense; (15) TABs (Tectonically Associated Biological Provinces); (16) Huge tidal forces etc. or any combinations of these factors. (The concepts of "TABs" is raised by John Woodmorappe (1983b) and he supports his argument with empirical evidence and sound reasoning.) Of course not all of these factors would apply to plants which have a much poorer fossil record than animals.

Nature of the Column'

Now at once, some will immediately object to the inclusion of 10, 12 and 14 above as these three factors

are the product of human thought rather than physical factors. I believe they are justified however because I am not convinced that the geologic column as presented to us is indeed an exact reflection of what is physically found, i.e. the "column" consists not only of physical evidence but also of human concepts.

As an example, I refer to Potapenko and Stukalina as quoted by Woodmorappe (1983b). They ruled out a Precambrian or Cambrian age for some crinoids because no previous crinoids had ever been found in rocks earlier than the early Ordovician! This is pure circular reasoning— how could they possibly know for sure that the time range for these crinoids could not have extended back to the Precambrian or Cambrian? In view of the fact that the Coelacanth fish existed from the Cretaceous (80 million years BC) to the year 1939 without leaving a single known fossil indicates that no one can be certain as to when a fossil representative really first lived nor when it exactly became extinct. Other examples are the Tuatara beakhead which represents an order of reptiles which supposedly became extinct in the late Mesozoic 130 million years ago but which survives today in islands near New Zealand. Many others are known— the living deep-sea mollusk *Neopolina Galathea* from a class which has not been found as a fossil since the Devonian— 280 million years ago! It is also common knowledge that a considerable number of organisms have "skipped" various ages i.e. their fossils have been found in various ancient deposits and do not appear again until after several ages or epochs have elapsed yet they must have lived in between!

Although these cases are relatively infrequent, it is shown that no paleontologist can ever be certain as to the date of the "first" or "last" appearance of any taxon and therefore the paleontologist's evolutionary prejudice plays a considerable part in setting up the geologic "column" on paper. Similarly, the mistaking of *lateral variation* within a species or genus for vertical evolution can confuse the reality of the "column," as can pre-conceived evolutionary bias in assigning fossils to a particular age or epoch. Both other scientists and lesser educated people also tend to rather uncritically accept evolutionists' opinions about fossils, co-relation and stratigraphic sequences. Let us not be brainwashed by evolutionists' subjective approaches, based on a *conceptual view of the fossils in a long term time frame*. Even with all the built-in bias, the column still has its difficulties such as the most complex graptolites being found in the earliest beds. (Davies 1961, p. 30)

Francis Hitching (1982, pp. 19, 196) claims that there have been repeated occurrences of fudging and fixing the (fossil) evidence to fit into the straitjacket of evolutionary theory. Hitching incidentally, who is not a creationist, admits quite frankly that. "The curious thing is that . . . the fossils go missing in all the important places."

More Flood Geology Problems

Woodmorappe (1983a) has dealt with the paucity of fossils in sandstones, and I have no more to add. I can see no problem with the partial erosion of previous beds and the redeposition of the eroded material into "younger" beds. In fact, if the column is indeed up to 700 million years in age, such cases should be extremely frequent. Also, lithification processes are not very well

understood and nobody can say how long it would take for any particular soft sediment to lithify. In fact it is a good argument for a young sedimentary record because there has not been enough time for many such cases to occur. The presence of single-celled organisms and algal stromatolites in the Precambrian are not a concern for Flood geologists— these organisms can be found in all strata up to the present day where we have many living examples of these microfossils virtually unchanged from their alleged evolutionary ancestors hundreds of millions of years ago. No evolution is indicated here!

The matter of the missing human pre-Flood populations is not particularly bothersome, (Wood 1976, pp. 96-109). Some have been found (Omo I and II, Swanscombe, Steinheim, Neanderthal) but once we dismiss the *concept* of the "column" as being factually time representative, the problem largely disappears. Ancient man's artifacts have been found all over the world but because of the exaggerated significance given to the geologic "column" none of them would be accepted by evolutionists as being genuine. They are ignored or considered as reworkings etc. Also the Pre-Flood population may have been relatively small. In short, Morton's concerns, although legitimate and deserving of much investigation and discussion, largely lose their value, once we rid our minds of the conceptual evolutionist framework which really lies behind the geologic column.

In a more recent article, Morton (1984) draws our attention to the phenomenon of world-wide lithologies in all "ages" most of which are accompanied by unique fossil assemblages. It must at once be admitted that considerable difficulties exist here for both uniformitarians and diluviologists. One can only wonder at the tremendous *global* depositional activities on a scale so vast that it appears to fit in with the world-wide Flood of Noah. But the many difficulties need close examination by creationist geologists. Nevertheless the orthodox geologist also has enormous problems to face and until further research is carried out we have no alternative except to postpone judgment.

Significance of Fossils

As Williamson (1981, p. 49) found with snails, the rock record shows stasis. Eldredge (1980, p. 50) tells the same story with trilobites (where, incidentally, he found the most complex forms in the "earliest" beds!). Norman Macbeth (1971, pp. 13-6) wrote that there is not really a *true* fossil succession. He noted that we have a *stufenreihe* (series of stages) which is taken as an *Ahnenreihe* (series of ancestors). The "tree of life" does not give us the phylogenies (family trees of descent) whether based on fossils, comparative anatomy or embryology. The tips of the tree are well populated while the trunk is shrouded in mist and mystery. Although Macbeth was not writing about fossils alone, Gould (1977, p. 13) did not equivocate— "the family trees which adorn our textbooks are based on inference, however reasonable, not the evidence of fossils."

Further strong evidences for the rapid and continuous deposition of almost the whole geologic column are given by Morris (1974, pp. 115-6). Woodmorappe (1983a) tells us that "there are *several* habitats of fish, reptiles etc., . . . which explain why there are different types of reptiles, mammals, invertebrates, etc. appear-

ing and disappearing in *different* parts of the column." While some degree of fossil separation and co-relation may be useful in local areas, it is very subjective and impertinent to use the system for global co-relation. As the geologist moves into far-flung areas hundreds or thousands of miles away, he is faced with many different circumstances such as different assemblages mixed with his "index" fossils, different stratigraphic topography etc., and the exercise becomes more and more a matter of subjectivity and preconception. Anyway how does anyone "know" if an index fossil in one area has exactly the same time-equivalent in any other area?

I find Morton's Flood model (1982) rather unconvincing mainly because he has tended to be overly concerned with matters which possibly indicate longer periods of time than the Flood model would allow. Most of these concerns cease to be a problem when one remembers that the Flood and its aftermaths and climatic effects right up to the present have all had their effects on the sedimentary rock record. He is of course quite correct to bring these matters to the attention of all creationists as we must not seek to evade them. However, the powerful evidences for the recent formation of the sedimentary strata plus the equally powerful objections to evolutionary time-scale geology were mostly overlooked. Morton's model proposed that the huge bulk of sediments were post Flood. I truly cannot imagine such enormous sedimentary processes within the known history of mankind all occurring since the generally accepted Flood date of around 2450 BC. Apparently the Flood of Noah left few sedimentary deposits! Morton's case is only reasonably valid if the geologic column is as *precise, and exactly physically correct* as historical geologists would have us believe. Of course problems such as the sequence found in the "Triassic" Newark Basin need a lot of very close objective examination but the answer may lie in the post Flood sedimentary activities up to as late as 1000 BC or even 1000 AD, who knows? Notwithstanding what I have just said, we must admit that there is a *broad* tendency in the column which is not incompatible with historical or Flood geology.

John Woodmorappe's works, I believe, give us reasonable answers to most of the details which would require solutions in a Flood model, and his works are the most comprehensive yet published. Even so, both evolutionists and creationists will continue to be faced with difficulties as no man was present to observe the events, but I believe the historical geologist has the most explaining to do.

Conclusions

I present the following observations and comparisons. The Flood model in detail *does* support creationism in that it predicts general stasis with variation within kinds and it predicts a fossil record with systematic gaps and extinctions. It does not support progressive creationism over long ages. The fossil record is hostile to evolutionism whether gradualistic (because of the virtual total and systematic lack of graded transitionals) or punctuated equilibria (because there is not enough time). Occam's Razor—the creationist/Flood model more easily answers the problem of the systematic fossil gaps. In short the fossil record, properly

considered, is much more in accord with Flood geology than with any form of evolutionism.

Finishing on a slightly different note, the state of the fossil record led William Corliss (pp. 629-30) (a non-creationist), to say: "Evolution, though, is only a theory, and all scientists must be psychologically prepared for its eventual refutation." Corliss has pointed to only three final choices—"Either the missing links are vanishingly rare, or life evolved in quantum jumps, or progressive evolution is an illusion." I think his final word "illusion" sums up both the uniformitarian theory of geology and evolution itself.

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EDUCATIONAL COLUMN

PROPERLY DEFINING "EVOLUTION"

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Abstract

Creationists should set an example for scientists, students and other non-scientists by (a) differentiating "evolution" from genetic variational change by appropriately using the terms micro-evolution versus macro-evolution, and (b) avoiding any mixing of theism with supposed naturalistic concepts.

Introduction

Among living things much variety as well as noticeable constancy is very evident to both casual observer and scholarly scientist. Even fossil plant and animal materials may be described as highly variable, but always within recognizable groups of flora and fauna. Commonly, any differences or changes in living things and fossil materials are referred to as examples of "evolution." What is the conscientiously fair and just manner of teaching about "evolution"?

The term "evolution" is placed in quotation marks since repeated ambiguity regarding change in living things, as well as fossils, is evident when the term is used by evolutionists and creationists. Charles Darwin's followers have long disregarded the necessity of careful definitions and stipulations of definite meaning with regard to change and the term "evolution."

In addition, evolutionists have regularly failed to differentiate between "historical" time spans (commonly understood to refer to activities of human beings) and "pre-historical" time periods before existence of any human beings. Evolutionists merely assume a basic identity between processes of change during the lifetime of an observer (historical), and presumed change processes in time long past (pre-historical). But human beings have made no observations or measurements in supposed geological time periods. Therefore, evolutionists should admit that so-called historical geology is a complete misnomer.

Also, quite often creationists employ the term "evolution" without making explicit the magnitude of change meant as specific referent for "evolution."

Ambiguity Should Be Avoided

All teachers and writers should work diligently to avoid ambiguity in their terminology. Evolutionists do not eliminate ambiguity in any significant manner when they maintain that "evolution" is any change in the genetic composition of a population of organisms over successive generations. Yet many evolutionists will recommend that limits of variation can be established by breeding tests.

Creationists, then, have the responsibility to delineate meanings for "evolution" so as to avoid ambiguities (i.e., semantic confusion) that can effectively influence student understanding during discussions of origin questions. This is paramountly important in the 20th century now that several generations of students have been "turned away" from the traditional creation concepts of first origins accepted by founders of modern science (Moore, 1983, pp. 55-58, especially footnote on p. 92). This applies particularly during discussions of

human origins since evolutionists have adopted a fully animalistic origin of man as the conventional wisdom to be taught in a monopolistically exclusive manner.

Creationists can contribute to delineation of meaning, if they will provide the very practical example of consistent use of the prefixes "micro-" and "macro-" every time they talk or write or teach about "evolution." If "evolution" has the connotation of change, then which change: 1) broad (or "vertical") such that easily recognized, totally new organisms come into existence; or 2) narrow (or "horizontal") such that only limited genetic variational change occurs within easily recognized groups of organisms?

Creationists who talk, write and teach about "evolution" should avoid ambiguity and associated semantic confusion by insisting that "macro-evolution" be distinguished from "micro-evolution." Initial distinctions are made easily by means of the following useful dichotomy:

Micro-evolution: real, tangible, concrete, historical
Macro-evolution: imagined, intangible, abstract, pre-historical.

Therefore creationists can stand forthrightly for teaching this conclusion: Micro-evolution is documented and demonstrated (in accordance with breeding criteria); whereas macro-evolution is based totally upon circumstances of completely unexplained origin, even after decades of geological and genetic research. This conclusion must be explained.

Macro-evolution versus Micro-evolution

With regard to change associated with the term "evolution," I assert that practical and necessary clarification is gained by consistent use of macro-evolution versus micro-evolution. Micro-evolution is the most precise term as referent for real, limited, narrow, horizontal change *within* a recognizable group of living things; whereas macro-evolution is the most precise term as referent for imagined, unlimited, broad, vertical change *between* organisms from one level of complexity to another.

The word "imagined" is used deliberately in association with the concept of vertical change of macro-evolution since that concept is totally unobservable, at least with respect to any change in living things *from* one level of complexity of flora and fauna *to another* level of complexity. In contrast, horizontal change of micro-evolution is repeatably observable by investigators of present living plants and animals.

This matter might be expressed in a fully practical manner if speakers, writers, and teachers will utilize contrasting specifications about "evolution," as follows:

a. On the one hand, narrow or horizontal magnitude of change of *micro-evolution* has been repeatedly detected *within* any separate group of easily recog-

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nizable plant or animal. For example:

Within groups of cats, cattle, dogs, pigeons, swine (or apples, corn, roses, strawberries, wheat) breeding records document and demonstrate genetic variational (horizontal) change of micro-evolution.

Further, a definite historical time line is involved in accumulations of data over generations after generations of observed changes in living things. Therefore, narrow, horizontal, *micro-evolution* is real and tangible.

b. On the other hand, broad or vertical magnitude of change of *macro-evolution* has *not* been detected *between* separate groups of easily recognizable plants and animals. No known cross-breeding has ever occurred between fully separate groups of organisms. For example:

Proposed or supposed changes from unicellular organization to multicellular organization in living things have *not* been observed in breeding practices.

Further, such imagined changes as mammals coming from reptiles or birds from reptiles or human beings from some anthropoid group have never been observed. Thus vertical changes must be acknowledged as merely inferred ideas about pre-historical time, which are not at all documented by any testable means genetically. Therefore *macro-evolution* is *imagined* and supported only by evidence of circumstantial similarities of unexplained origin.

Comparative Studies Limited

Evolutionists must rely fully upon multiple sets of circumstantial similarities of genetic materials, anatomy, embryology, cell biology, geographic distribution, protein components, or even behavior. Notably evolutionists utilize extensive arguments from homology and comparative studies. However, creationists are duty bound to emphasize that such comparative studies do not include any attention to or explanation genetically of the *origin* of detected similarities.

Whether evolutionists imagine some gradual processes of change or suppose sudden, "quantum" jumps of change, all evolutionists claim that organisms more similar to each other must have been more closely related than organisms less similar to each other. Thus human beings and chimpanzees are presumed to be closely related because of the circumstances of similarities, but absolutely no genetic documentation exists.

Creationists, then, are duty bound to explain regularly that all comparative reasoning involves specifically this *basic* assumption: The *degree of relationship depends upon the degree of similarity*.

At least one leading evolutionist has admitted that this "simple assumption is the *logical* basis of efforts to reconstruct evolutionary history" (Ayala, 1978, p. 68) by means of comparative studies involving circumstances of similarities. (Emphasis added). Fortunately Dr. Ayala did not claim a *biological* basis because all such efforts to "reconstruct evolutionary history" are merely recitations of circumstantial evidence for a pattern of comparative reasoning that maybe plausible to an evolutionist, yet is not biologically demonstrable. This is so, since no genetically documented lineages of different groups of organisms are ever established by circumstantial evidence of similarities. No breeding tests establish any actual biological affinities between groups of recognizably different organisms.

Attention to Consequences

Creationists are duty bound to make fully explicit certain consequences of practiced use of ambiguous expressions about change and comparative reasoning. Perpetuation of ambiguous use of the term "evolution" because of repeated failure to employ the practical pre-fixes "micro-" and "macro-" leads to particular results. Too commonly there is an uncritical combination of theism with practical atheism, as well as uncritical "mixing" of supernatural concepts (creative acts of God) with supposed natural concepts (actually macro-evolution magnitude of change). Thus the contradictory, illogical combinations of "theistic evolution" and "progressive creationism" have been coined.

Proponents of "theistic evolution" or "progressive creationism" are basically macro-evolutionists. Initial support for this assertion is found in the grammatic structure of the terminology. Necessarily the word "theistic" must be recognized as an adjective descriptive of the noun "evolution."

Specifically, a "theistic evolutionist" or "progressive creationist" is one who desires, in some manner or degree, to "add" God to so-called naturalistic concepts, such as an explosion of some dense matter, or sudden and spontaneous appearance of living substance, or emergence of human beings from some animal ancestry.

Essentially belief in "theistic evolution" or "progressive creationism" is dependent upon atheistic evolution. In order for the evolutionist to have a position to which God, the Creator, may be added (in whatever manner or degree asserted), a definite preliminary acceptance of macro-evolution magnitude of change of supposed naturalistic phenomena is required. The "theistic evolutionist" or "progressive creationist," then, must first be an evolutionist, and secondarily make some personal selection of involvement of God, the Creator of all things.

Detailed discussion of this confusion of language and meaning is beyond the scope of this short article. Stated very briefly, belief in the supernatural is "mixed" with belief in supposed prehistoric, naturalistic phenomena by "theistic evolutionists" and "progressive creationists." As a result of mixing creative acts of Creator God with concepts of explosion, accidents, and chance combinations of matter much contradiction and inconsistent reasoning abounds. Consequently creationists have the very special responsibility to point out such uncritical acceptance (ignoring) of contradiction and inconsistent patterns of thought.

Conclusions

On the basis of all the above, creationists are heavily responsible to help scientists, students and other non-scientists recognize and avoid semantic confusion by differentiating "evolution" from genetic variation. This can be accomplished through regular use of micro-evolution *versus* macro-evolution by creationists. And clarification of language will be gained only by avoidance of contradiction and inconsistency that are consequential to efforts to "add" God, the Creator, to supposed naturalistic concepts, as attempted by "theistic evolutionists" and "progressive creationists."

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CORRECTLY REDEFINING DISTORTED SCIENCE: A MOST ESSENTIAL TASK

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Abstract

From a correct philosophically neutral definition of science the rules of the scientific method and the freedoms of scientists logically follow. Since Darwin's time the scientific community has distorted science by injecting into its definition a particular metaphysical belief system, i.e. materialistic monism. Thus science has been by definition biased against creation, with the result that "unbelievers" are denied their freedoms as scientists, teachers and students and are subjected to discrimination and injury. A reformation of science at the definitional level is an essential task for Christians engaged in science and education.

Introduction

For Christian participants in the scientific enterprise the creation-evolution controversy is surely an important concern. The monolithic evolutionary thought system currently monopolizing scientific activity must certainly be challenged. However, an even more fundamental issue with respect to science is the question of what a correct definition of science is, how science has been distorted, and how distorted science can be reformed. As long as a definition of science reigns which incorporates philosophical assumptions inimical to Biblical theism, the creation-evolution question in the scientific arena is of necessity predetermined against creation—by definition.

Science Properly Defined

Science is simply a method by which fallible humans can examine the natural world and critically test all of their ideas about it. Sir Peter Medawar said a few years ago in a published interview, "There is nothing more to science than its method . . ." If Medawar is right—and he is—a correct definition of science is philosophically neutral at least to the extent that it has nothing to say about what a scientist believes or disbelieves. (Appendix I) A concise, philosophically neutral definition of science is as follows:

Science is human experience systematically extended (by intent, methodology and instrumentation) for the purpose of learning more about the natural world and for the critical empirical testing and possible falsification of all ideas about the natural world.

It is not the purpose of this discussion to analyze the scientific method, but rather to examine the implications of a correct definition of science and the deleterious effects of the currently prevailing distorted definition. Let us now consider the implications of the above concise definition.

The Rules of the Scientific Method

The definition of science lays upon the scientist the requirement of obeying the rules of the scientific method. The basic rules of the scientific method flow logically from the definition of science and include the following:

1. Scientific hypotheses may incorporate only elements of the natural empirical world, and thus may contain no element of the supernatural.
 2. Scientific hypotheses must be so constituted that they can be subjected to empirical test, that is, they must be falsifiable.
 3. The scientist must submit his procedures, data and conclusions to critical review by his peers.
- Provided the scientist functions in accord with the above rules of the method, he has broad freedoms in his practice of science.

The Freedoms of the Scientist

The freedoms of the scientist flow logically from a correct definition of science. They include the following:

1. The scientist is not required to hold to or reject any particular philosophical-religious belief system. He is free to choose from among such disparate beliefs as atheistic materialism, pantheism, agnosticism, Eastern religions, pure idealism, liberal Christianity, materialistic evolution, theistic evolution, and Biblical special creation.
2. Since peer review, therefore, may not have any element of philosophical bias with respect to the beliefs of scientists, scientists (and also teachers, students, and all scholars) have the freedom, indeed, the right to be judged solely on the basis of their performance under the rules of the method, not at all on the basis of a willingness to surrender their minds to somebody else's belief system, even to that of the majority of scientists.
3. All scientists need not function under the same philosophy of science and conceptual frameworks. These, but not the hypotheses of science, may encompass supernatural elements such as past divine intervention, special creation, or divine teleology in the natural order.
4. There is no restriction on the sources of ideas and hypotheses in science. Other scientists should have no concern about the source of ideas which gave rise to one person's hypothesis, if it deals with the reproducible empirical world and is open to empirical test by any critic or doubter.
5. A scientist is free to adopt or reject any of the following five assumptions which are held by many scientists and other scholars:

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- a. That there is no divine teleology in the natural world.
- b. That no divine intervention has ever occurred in the natural world.
- c. That every observable datum has its total explanation in terms of materialistic cause and effect.
- d. That God does not exist and only the material world is real, or at least that the scientist should function accordingly in his scientific thought and research.
- e. That the scientist should adopt the view that his personal faith has no relevance in his scientific endeavor.

The Definition of Science Has Been Distorted

It is this author's opinion that Charles Darwin had a hidden agenda for science. There is much evidence for this in his writings. Neal Gillespie (1979) of Georgia State University in his important book, *Charles Darwin and the Problem of Creation*, established the fact that Darwin espoused logical positivism as his philosophy of science. His hidden agenda, then, was to remove from the thinking of all scientists any concepts of special creation, divine intervention, or divine teleology in the natural world. That this agenda has been achieved with almost total global success in the spheres of science, education and scholarly disciplines is obvious to any informed observer. (Appendix II)

Perhaps the most authoritative evidence for the total victory of Darwin's hidden agenda is to be found in a recent official document published in the spring of 1984 by the National Academy of Sciences (U.S.A.). This slick-paper 27-page booklet openly attacking all believers in Biblical special creation is entitled, "Science and Creationism—A View from the National Academy of Sciences." (National Academy of Sciences, 1984) In the introduction Frank Press, N.A.S. director, tacitly approves of those brands of religion which accept evolution into their belief systems. (pp. 6, 7) But the remainder of the document directly attacks believers in Biblical creation.

The closest thing to a concise definition of science appears on page 26 of the N.A.S. document, in the "Conclusion." There it is stated:

... the goal of science is to discover naturalistic explanations for phenomena—and *the origins of life, the earth, and the universe are, to scientists, such phenomena*—within the framework of natural laws and principles and the operational rule of testability. (emphasis added)

The emphasized clause states a belief which can be neither proved nor disproved by the methods of science. If it had been attributed to "some scientists" or to "the majority of scientists," there would be no problem. But the belief in a closed materialistic universe is wrongly attributed by the National Academy to "scientists. The clear implication is that this belief is inherent in the definition of science and so is required intellectual baggage for all bonafide scientists. That this conception of science was in the minds of the framers of this booklet is quite clear from the tenor of the remainder of the document. The N.A.S. booklet pictures science as the search for understanding of everything in terms purely of materialistic cause and effect in a closed materialistic universe. Darwin's theory is suffering much rough revisionist treatment,

but his hidden agenda has achieved a stunning universal conquest of all of secular science, education, and other scholarly disciplines.

Implications and Consequences of the Distorted Definition of Science

The reigning definition of science is distorted by the incorporation of a belief system, materialistic monism, a belief utterly inimical to Biblical Christian faith. As long as this definition prevails, the creation-evolution issue is already decided in the scientific arena—by definition. Bible-believing Christians are in effect ruled out of the arena of rational discourse because they believe things which a scientist may not believe. To begin with, their epistemology is frowned upon, repudiated on the basis of *a priori* principles, as is their fundamental approach to questions of origins. This, then, is the ground for all of the opprobrium, discrimination, and overt injury to which Christians have been and are being subjected in science and education. While this status quo continues, Christian believers in creation will be squeezed out of science and education, perpetually held to a tiny minority, denied the full rights of participation in the scientific enterprise. The squeeze will continue to be applied in the secular educational system mainly by indoctrinating students with the distorted view of science. Thus the status quo is self-perpetuating, for indoctrinated students ultimately supply the future corps of teachers and scientists. This has been going on now for many decades, and only a most profound revolution will change the situation.

The Remedy for Distorted Science: A New Consensus

The essential remedy for distorted science is the achievement among scientists and educators of a consensus which reestablishes a philosophically neutral definition of science, including the rules and freedoms logically deduced therefrom as outlined above. Christians involved in science and education must carry the principal burden of the campaign to achieve this consensus. The logical position stated in this paper is very strong, indeed, impregnable. For three years it has been circulated among selected secular academics in the form of a two-page outline accompanied by four pages of explanatory notes and references, under the title, "A Proposal to Eliminate the Deleterious Effects of Religious Beliefs on Science and Education." In February, 1985, this Proposal was presented and defended in Alberta at three secular universities with faculty members in attendance. No difficulty was experienced in maintaining the argument.

Anybody who opposes the proposed consensus to reestablish a philosophically neutral definition of science must defend in public the inclusion in the definition of science of his or her personal metaphysical belief system. Metaphysical belief systems are unprovable and non-refutable by the methods of empirical science. Consequently the opponents are left vulnerable to the charge of dogmatism and bigotry. On the other side, a great beauty of the proposed consensus is that it requires nobody to change his personal beliefs, save one—the belief that anybody's belief system belongs in the definition of science.

It appears that this issue of the philosophical neutrality of a correct definition of science is one in which the secularists in science and education can easily be put

on the defensive. Any public debate exposes the offenses of the opposition against science, against the hallowed principle of academic freedom, and against the most precious rights of individuals in a free society. The ambiguities of the creation-evolution debate are excluded, being immaterial to the problem of defining science.

Indeed, we cannot lose. If the consensus is adopted by the majority of scientists and educators, victory for truth is complete. On the other hand, if and to the degree that the status quo prevails, the bigotry of its defenders will be thoroughly exposed. With such a strong strategic and tactical position and in view of the vital truth that is involved, there is no reason why Christians should not proceed to press this issue and seek to engage the members of the secular establishment in open debate aimed at achieving the proposed consensus at the earliest possible date.

The second remedy for distorted science relates to the participation of evangelical Christians in science and education. Dr. George Howe (1986), in a recent letter to this Quarterly, discussed in some detail important errors which Christians should avoid as they undertake to participate as creationists in science, science education, and the promotion of the creation model of origins. We would like to add an admonition to his recommendations. It is essential that Christians in science be perfectly clear on the fundamental principle discussed in this paper, namely, that nobody, including Christians, should seek to insert his personal belief system into the definition of science. It would appear that perhaps lack of clarity in this has led to some of the errors against which Howe has warned us. Science is not in itself a Christian endeavor; it is a human endeavor. Christian practitioners of science should strive to function as Christians in a manner which demonstrates to the world that one can be a better scientist because of his faith in Jesus Christ and in the Word of God.

Toward this end it is necessary that we have the several categories of thought which are involved in our scientific endeavors properly identified and defined. They are the following:

Religious-philosophical faith or world view
Episteme (philosophy of science, epistemology, motivation, goals, etc.) (Gillespie, 1979, pp. 1-18)
Conceptual frameworks (systems of theories, fundamental concepts and assumptions for particular scientific disciplines or areas of research) (Jones, 1971)

Scientific hypotheses

Of these categories the first three may incorporate elements of the supernatural. The fourth category, that of scientific hypotheses, may not incorporate any element of the supernatural, as was stated earlier in the list of rules of scientific method. The reason for this is, of course, that the supernatural, being personal, is not subject to investigations by the method of empirical science.

If Christians engaged in science and science education, or in the task of properly relating Christian faith and Biblical revelation to science have these categories correctly distinguished, they will be able to avoid the pitfalls discussed by Howe. If the consensus which we propose in this paper is achieved, Christians should

expect the freedom in suitable technical journals openly to draw conclusions which explicitly relate their hypotheses and empirical data to their conceptual frameworks. The secularists do the same without fear or penalty. In the light of the correct definition of science the current situation is absurd. It is absurd when a man of Dr. Robert Gentry's accomplishments in the study of radioactive halos, for example, can only make the most subtle and oblique references to the connection of his scientific data with unpopular creationist concepts, in this case the idea of a young earth. (Gentry, 1974) But we have a long way to go before this freedom is restored to Christian participants in the scientific enterprise.

Appendix I

There is no question that the scientific enterprise has profound philosophical and religious implications. Just what these implications are, however, is a matter of dispute, for numerous philosophies of science have been advanced since the advent of modern science in the 16th century: Oppenheimer, J.R., 1962, *Encounter* 19:3-10; Klaaren, Eugene M., 1977. Religious origins of modern science. Eerdmans, Grand Rapids, MI; Ayer, A.J., 1952. Language, truth and logic. Dover Publications, New York; Harre, R., 1972. The philosophies of science: an introductory survey. Oxford University Press, New York; Whitehead, A.N. 1925, 1953. Science and the modern world. Macmillan, New York, pp. 1-18; Jaki, Stanley, 1974. Science and creation: from eternal cycles to an oscillating universe. Neal Watson Academic Publishers, New York, pp. 276-305; Schoepflin, Gary L., 1982. Perceptions of the nature of science and Christian strategies of nature. *Origins* (Geoscience Research Institute, Loma Linda, CA) 9:(1)10-27. For Christians, of course, the correct philosophy of science is grounded in Biblical truths and principles.

Appendix II

The following references illustrate this global conquest of science by the distorted definition favored by Darwin: Gillespie, N.C., 1979. Charles Darwin and the problem of creation. University of Chicago Press, Chicago, pp. 1-18; Monod, Jacques, 1974. On chance and necessity, in: F. Ayala and T. Dobzhansky, editors. Studies in the philosophy of biology. University of Calif. Press, Berkeley, pp. 357-359; Simpson, G.G., 1960. The world that Darwin gave us. *Science* 131:967, 968; Jastrow, Robert, 1977. Until the sun dies. W.W. Norton, New York. (See pp. 60-63); Huxley, J., 1960. in: Sol Tax, editor. Evolution after Darwin, Vol. 3. University of Chicago Press, Chicago. (See pp. 45, 46); Curtis, H., 1979. Biology, 3rd edition Worth, New York. (See pp. 11, 19, 28, 754, 945); Crick, F.H.C., 1979. in: *Scientific American* 241:224; Brennecke and Amick, 1978. Psychology and human experience, 2nd edition Glencoe Publishing, Encino, CA (See pp. 2-4, 14, 81, 94, 98.)

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PANORAMA OF SCIENCE

The Magnetic Field of Uranus

On January 20, 1986, the Voyager 2 space probe passed by the planet Uranus and, among other things, made the first measurements of the Uranian magnetic field. I have been eagerly awaiting the results, because I was rash enough to make a prediction in this journal (Humphreys, 1984) that Uranus' present magnetic dipole moment (a measure of the strength of the field's source) would be "of the order of 10^{25} J/T" (1 Joule/Tesla = 1 Ampere-meter² = 1000 Gauss-cm³). This was based on my hypothesis about the origin of planetary magnetic fields and the assumption that the field has freely decayed since creation for 6000 years. The exact value can vary by an order of magnitude, depending on the size and conductivity of the planet's core. If you use the (estimated) values cited in the equations listed, you will arrive at a value of 2.0×10^{24} A m². In the conclusion this prediction was offered as one test of my hypothesis. The first magnetic field data appeared in late January (Palca, 1986), but the April issue of *Sky and Telescope* gave more details (Beatty, 1986). It reported a magnetic moment of 4×10^{27} Gauss-cm³, or 4×10^{24} A m² in the units I used. The strength of the field surprised many dynamo theorists (Rossbacher, 1986), but it is well within the bounds of my prediction, thus supporting not only my origin hypothesis, but also the free-decay theory and a young age for the solar system.

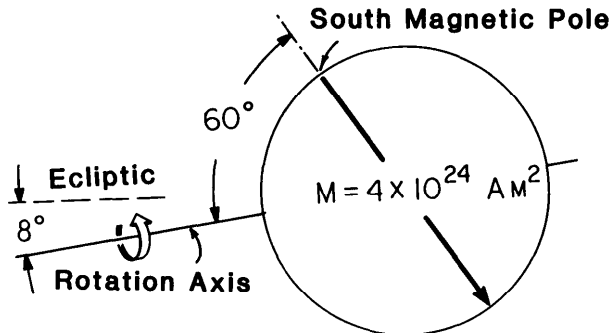


Figure 1. The magnetic and rotation axes of Uranus are an unusually large 60 degrees apart, according to Voyager 2 measurements (Beatty, 1986). The rotation axis is also in an unusual direction, being nearly parallel with the plane of the ecliptic. The measured dipole moment, M , is within the bounds predicted by a creationist hypothesis (Humphreys, 1984).

Voyager also revealed another remarkable feature: the magnetic poles of Uranus are near its equator, being tilted about 60 degrees away from the planet's rotation axis (Figure 1). This angle is much greater than for any other solar system object. Dynamo theorists were startled, because they expect fields to be closely tied to rotation axes most of the time. However; the tilt may have a rather simple explanation in terms of the creationist free-decay theory. The spin axis of Uranus is also unique, being within eight degrees of the plane of the ecliptic. All of the other planets and the Sun have spin axes between 60 and 90 degrees away from the ecliptic.

The explanation for (Uranus) unusual (spin) tilt has still not been determined, but a catastrophic

impact relatively early in its history remains a strong possibility (Rossbacher, 1986, p. 17).

If such an event rapidly tilted Uranus' spin axis over into the ecliptic plane, the magnetic poles would not follow the spin axis of the outer layers immediately. Rather, the inertia of the core would tend to keep the magnetic poles pointed in their original direction. Frictional forces on the core would then begin moving the magnetic poles in the direction of rotation, but not in the direction of the spin axis. Eventually the magnetic poles would rotate with the planet. Thus the magnetic tilt of Uranus would be a relict of the former field direction. In summary, both the tilt and the intensity of the Uranian magnetic field give support to creationist theories. We owe the Voyager program a big vote of thanks.

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Contributed by D. Russell Humphreys

Excerpts from A World Without Heros (Roche)

... True enough, the West has long suffered an affliction of the spirit—one either peculiar to, or exceptionally virulent in, those cultures that sprang from the Judeo-Christian heritage. Its onset was evident in 1850, and recent times have added little to what the better minds in Europe and America were saying about it by 1900. One might say that the particular manifestation was human pride, inflamed by cheapshot philosophizers armed with a whole shipload of bad nineteenth-century information. Its most familiar carrier is secular humanism, that vision that has so strongly shaped this century and its "isms." Out of pride, it deified men's science and cut us off from the riches of life beyond the reach of laboratory instruments. Out of desire, it created a purely materialistic—and entirely fictitious—conception of reality. To secure man's status as creator of the new reality, it dismissed the old Creator and announced that hereafter the universe belonged to the most intelligent of the apes. Human beings, in their quest for the stars, were therefore relegated to the status of beasts, and beasts, moreover, directed by nothing more than natural selection and economic principles. The West will regain its health in exact proportion to the speed with which it puts aside this whole banquet of utopian claptrap.

Is it any wonder that the pinnacle of philosophy for young manhood this past century has been "go get yours?" With Albert Jay Nock, I defy the whole of this utopian theory to produce any behavior higher than what can be explained by the formula of Tolstoy's peasant character, Yashvin: "He is after my shirt, and I am after his shirt." There, in a nutshell, is the sum

philosophy of evolutionary theory, sometimes remembered as the law of the jungle. If utopianism is to be believed, we animal-men cannot possibly rise above this and therefore can have no complaint about the predatory statism and slavery of our time. Chesterton warned us, if men won't believe in God, the danger is not that they will believe in nothing, but that they will believe in anything.

Malcolm Muggeridge, surveying the wreckage of humanist utopianism in this century, offers a more specific fate: "When mortal men try to live without God, they infallibly succumb to megalomania, or erotomania, or both. The raised fist or the raised phallus; Nietzsche or D. H. Lawrence." Just so. The Soviets officially choose the one, and we, unofficially, the other, but it is only too obvious that we both suffer the same infection.

We misread our dilemma—and hugely underestimate our peril, I fear—if we suppose that the nature of world struggle is geographic, or economic, or one system of government versus another. The conflict is between our Christian heritage and secular power, between keeping the faith and having none, between God and clever monkeys who are astonished at their ability to add and subtract. The conflict is between irreconcilable conceptions of man, the universe, and ultimate reality. C. S. Lewis, as usual, put our choice in plain words: "The Christian and the materialist hold different beliefs about the universe. They can't both be right. The one who is wrong will act in a way which simply doesn't fit the real universe. . . ."

Galileo's is an ancient faith, man's second oldest, as old as Eden, but reanimated by the seemingly invincible science of the nineteenth century: "Ye shall be as Gods." It is the vision of Man without God, of Man at the center of being, autonomous, free of external controls and in command of his own destiny. It is the promise of a new man and of a new world given purpose and plan by Man, the new Creator. It is the dream of an avenging angel that will fill men's hunger for justice at last, not in any imaginary heaven but here and now, by sweeping away all that is weak and unclean. Its great Commandment, Whitaker Chambers remarked, "is found, not in *The Communist Manifesto*, but in the first sentence of the physics primer which reads: All of the progress of mankind to date results from the making of careful measurement."

Such a brew of science and vision is without historical parallel, and it struck the Western mind with tidal force. It purported to fit the older Christian foundations, both in the natural sciences, where the concept of an ordered cosmos was retained, and in the moral perceptions of justice and right that it borrowed from Christianity. The Marxists had only to substitute a new ruling troika—Man, Party and State—man for God, Lenin for Jesus, and New Jerusalem for eternal life, to stay in business at the same old stand. To a certain frame of mind it was, and is, irresistible. Men seized it with joy, and later yielded their conviction to reality with fierce reluctance or not at all—the signature of potent dogma. On its surface it seems a vision of good, and it has moved millions of good hearts. To a Christian, it is the original sin and the greatest of heresies.

By its own view and the Christians' alike, "good" is the one thing the vision and its works cannot be. The natural universe, according to the vision, is all there is, and there is no good or evil in it; only natural events. What, then, makes a priest or an artist or a teacher or even a politician choose his vocation when he knows he can receive greater material rewards doing something else? What then, drives men and women to suffer and die for their family, their country, their beliefs? Don't these acts suggest that man may have a spiritual side if not a pervasively spiritual nature? . . .

Despite the reassurances of some of our best thinkers, materialism is not dead. While people are generally willing to allow for the existence of some vague transcendent force at work in the world, many resist attempts to identify it specifically with words such as God or Creator. And when they do, they are distinctly uncomfortable with the idea of defending their own beliefs because beliefs, by definition, are not objective, measurable, or empirically verifiable, and to give witness to them in the course of one's own work would be an affront to others who might have different views. Worse still, it would be embarrassing. We live in a very "sophisticated" world in which it is all right, as I said before, to believe in The Force; just don't talk about it at work...

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Roche, George. 1986. A world without heros. *Imprimis* 15(8):34. Reprinted by permission from *Imprimis* the monthly journal of Hillsdale College.

Acid Rain or Lack of Minerals Causing Forest Decline:

A View from a Young Earth Perspective

A recent article by a consulting editor of *American Laboratory* (Scott 1986) offers an interesting speculation that can be related to the young earth hypothesis. The effect of acid rain as the major cause of forest decline noted in many parts of the world was downplayed, whereas the depletion of essential soil minerals was identified as the primary culprit.

The major thesis for this editorial comes from the book, *The Survival of Civilization* (Hamaker 1982). The author claims that since the retreat of glacial advances which supplied minerals in the form of finely ground rock, essential for healthy tree growth and distributed worldwide by water and wind, the mineral content of the soil has been depleted in certain forest areas. Furthermore it is postulated that soil microorganisms cannot supply the nutrients available in the rock. Thus this effect, not acid rain, is the primary cause of forest decline.

The evidence offered in support of the lack of essential minerals as the major cause of forest degeneration is referred to as the "Austrian accident". While resurfacing a road in an area of a sick forest in Austria, many needles of spruce and Scotch fir and the leaves of beech trees accidentally were coated with gravel dust from a type of gneiss identified as migmatite amphibolite.

A great deal of dust was created during loading of trucks. Clouds of it drifted down the slope of the wood, covering all needles and leaves and the

ground to a maximum depth of about 5-6 mm tapering off away from the source.

Within a few months, all sick fir trees became healthy and subsequently all of the trees recovered completely from damage caused by acid rain. They grow 50% better than before; the beech trees lose their leaves four weeks later than usual. (Scott, p. 8)

If such observations are correct the depletion of essential minerals for healthy tree production can be cast into a young earth framework. The possibility of a recent Deluge followed by a glaciation period has been discussed by creationists (Burdick 1978; Daly 1973, 1975; Hanson, 1977; Mulfinger and Snyder 1979 pp. 408-9; Oard 1979; Springstead 1971, 1973; Whitcomb and Morris 1963, pp. 292-311). During the Flood and subsequent glaciation period finely ground rock would have been distributed throughout the earth enriching the soil with essential minerals for tree growth. In the few thousand years since the Flood and its aftereffects, tree and plant production have depleted the soil of these minerals bringing on the present-day forest decline.

Some scientists have postulated cooling trends in the earth's surface temperatures, glaciation periods, heating trends, etc. This imagined cycling of the earth temperatures would cause periods of glaciation that would "provide" a needed inflow of minerals in the form of ground rock thus "supporting" a million/billion year earth history. However it seems that the simplest hypothesis to maintain is that of a young earth.

The subject is an excellent area for a qualified creationist to do some limited additional research. The following questions should be examined.

1. Is the primary cause of forest decline actually acid rain, soil demineralization, or a combination of these and other effects? The book review of *The Survival of Civilization* by Gribben (1984) and subsequent commentary by Lehman (1986) should be consulted. This latter information was kindly furnished by Oard (1986).

2. Is the evidence offered for the correction of forest damage, i.e., the Austrian accident and its results viable?

3. If soil demineralization is actually the major problem, can it be cast into a young earth framework and can any useful predictions or extrapolations be made?

Hopefully one of our members will tackle such a project.

QUOTE

A culture dominated by that sort of knowledge which is mere information presently will become a dull and impoverished culture, if not something worse. It may end in bathos, though meanwhile the fortunate members of the Knowledge Class may have diverted themselves in perverse pleasures under twisted trees. When the moral imagination is extinguished, those wicked things written on the sky soon take on earthly substance; and servitude to them is not mild.

Nothing is but thinking makes it so. The present mind-set of the American Knowledge Class was produced by ideas of the nineteenth and twentieth centuries: vulgarized Darwinism, vulgarized Freudianism socialist ideology—winds of doctrine of yesteryear. Mechanism and materialism, scientists' concepts now being undone by physicists of our own time, still lie at the back of the assumptions of the Knowledge Class. The typical member of today's Knowledge Class possesses no distinct awareness of that source of his prejudices; nor does he understand that the ground is shifting under his feet, that new ideas are at work. The presumed wave of the future may drown him.

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Contributed by Emmett L. Williams

Bubbles in Space

Recent redshift surveys of galaxies have shown a surprising distribution. Galaxies appear to be associated in groups, surrounding vast bubble-like voids in space. The overall arrangement is described as filamentary, foamy, or swiss cheese-like. (Anon. 1986a, Silk 1986) Such intergalactic structure is completely unexpected. It demonstrates inhomogeneity on a scale of billions of light years, whereas most theories of universe evolution demand strict homogeneity. In particular, big bang cosmology assumes that gravity waves uniformly shaped the distribution of galaxies. However, gravity alone would not lead to the observed chains of galaxies. Another common assumption is that small objects like star clusters formed initially, followed later by galaxies and finally, galaxy clusters. However, there is not enough time, even in evolutionary thinking, for the observed large-scale structure to develop. (Anon. 1986b) The natural origin of the universe remains an insoluble problem for cosmologists.

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Contributed by Don B. DeYoung

ARTICLE REVIEWS

Hermann Weyl and the unity of knowledge by John A. Wheeler. 1986. *American Scientist* 74:366-75.

Reviewed by Eugene F. Chaffin*

Introduction

Jesus is Lord. Jesus is Lord of time and space. John 1:1 states: "In the beginning was the Word and the Word was with God, and the Word was God." That this passage is talking about Jesus Christ is made explicitly clear in John 1:14 which states: "And the Word was made flesh, and dwelt among us (and we beheld his glory, the glory as of the only begotten of the Father), full of grace and truth." In John 8:58 Jesus said: "Verily, verily I say unto you, before Abraham was, I am."

The central theme of the article is discussion of Hermann Weyl's life and contributions to mathematics, physics, and philosophy. The article centers on the "puzzle of existence" and discusses it in terms of four mysteries: 1. what is the machinery of existence, 2. what is the deeper foundation of the quantum principle, 3. what is the proper position to take about the existence of the "continuum" of natural numbers, and 4. what can we do to understand time as an entity? In discussing these mysteries, Wheeler brings in many discoveries and thoughts (black hole thermodynamics, further ramifications of the Einstein-Rosen-Podolsky paradox, etc.) which occurred after the death of Hermann Weyl in 1955. A beautiful literary style is used and woven together with powerful imaginative descriptions of the ideas at the forefront of physics today.

Relativity

In the realm of physics, Hermann Weyl was the ultimate relativist. As every student of introductory physics knows, Einstein's special theory of relativity is based on the proposition that velocity is relative. When this proposition is held to be true, it is claiming that no law of physics known now or ever to be known can single out a state of absolute rest. It is not my purpose to teach, defend, or reject the special theory of relativity in this short article, so let us go on to the general theory of relativity. The general theory of relativity proposes that the laws of physics cannot single out a state of absolute uniform *velocity*, except in relation to the rest of the matter in the universe. That is, in a universe empty except for a single object, the object would not feel the effects of an acceleration. Acceleration is relative. For an elementary discussion of this, see G. Wheeler and L. Kirkpatrick (1983, pp. 232-233). Hermann Weyl, playing on the same team as Albert Einstein, carried the ball ten yards further. In his book *Space-Time-Matter* (1921) he states:

The same certainty that characterizes the relativity of motion accompanies the principle of the *relativity of magnitude*. We must not let our courage fail in maintaining this principle, according to which the size of a body at one moment does not determine its size at another, in spite of the existence of rigid bodies.

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Weyl proposed a unified field theory which unified electromagnetism and gravitation. In so doing he introduced the concept of gauge invariance, a concept connected with the law of conservation of charge, which still survives today although Weyl's unified field theory was rejected soon after its proposal. The rejection of the theory came when Einstein pointed out that the theory required the frequency of spectral lines to depend on the location and past histories of the atoms. Soon even Weyl himself rejected his theory, although the ideas behind it are essential to understand present day thought in this area.

Weyl's concept of relativity of magnitude, conformal invariance, scale invariance, or gauge invariance is an important idea which deserves attention from every serious physics student. James Clerk Maxwell probably never considered the concept in formulating his equations of electromagnetism, but nevertheless Maxwell's equations turn out to be consistent with scale invariance. See Dirac (1936). Other examples from modern field theory could be given which are scale invariant, or could be made so. As an example of a scale invariant problem, let us consider a modification of Newton's second law of motion for a planet or massive object orbiting the sun. I will use this not only as an example, but also to point out how it relates to possible time variation of physical "constants" G in Newton's law of gravitation and k in Coulomb's law of electrostatic force.

Time Variation of Constants

Newton's second law for a central force such as gravity reduces to the equations— see Goldstein (1950, pp. 60-63):

$$\frac{dp_\phi}{dt} = 0 \quad (1)$$

and

$$\frac{dp_r}{dt} = -\frac{GMm}{r^2} + \frac{p_\phi^2}{mr^3} \quad (2)$$

where $p_\phi = mr^2 \frac{d\Phi}{dt}$ is the angular momentum and $p_r = m \frac{dr}{dt}$ is the radial component of the momentum. Now

these classical equations do not retain the same form under Lorentz transformations, or are not Lorentz covariant, but do retain the same form under the Galilei transformations (which can be obtained from the Lorentz transformations in the limit that the speed of light is infinite). Whether this is a drawback is not to be debated here. Modify equations (1) and (2) so that they are scale covariant, i.e. satisfy Weyl's demand for "relativity of magnitude."

The modified equations are:

$$\frac{d}{d\lambda} (p_\phi) = 0 \quad (3)$$

and:

$$\frac{d}{d\lambda} (p_r) = -\beta \frac{\bar{G}Mm}{r^2} + \beta \frac{P_\phi^2}{mr^3} \quad (4)$$

where:

$$p_\phi = \frac{1}{\beta} m r^2 \frac{d\phi}{d\lambda}$$

and:

$$p_r = \frac{1}{\beta} m \frac{dr}{d\lambda}$$

Here b is a function of position and time such that $d\bar{\lambda} = \beta d\lambda$, where $d\lambda$ is the "proper time" interval and $d\bar{\lambda}$ is the time interval for the case $b = 1$. In other words, when we consider $b \neq 1$ we are considering a scale transformation. $\bar{G}$ is a constant such that $G\beta = \bar{G}$ (where G is not a constant). Canuto proved that $G\beta$ must be a constant and if M is constant then $G\beta$ must be constant. See Canuto (1977 and 1981).

To show that equations (3) and (4) are scale covariant, consider a function β' related to b by $b = \theta\beta'$ where θ is a function of position and time. Then:

$$\beta \rightarrow \theta\beta' \quad (5)$$

$$d\lambda = \frac{d\bar{\lambda}}{\beta} \rightarrow \frac{d\bar{\lambda}}{\theta\beta'} = \frac{d\lambda'}{\theta} \quad (6)$$

$$p_r \rightarrow \frac{1}{\beta} m \frac{dr}{d\lambda} \rightarrow \frac{1}{\theta\beta'} m \frac{dr}{\frac{d\lambda'}{\theta}} = \frac{1}{\beta'} m \frac{dr}{d\lambda'} \quad (7)$$

When the relations (5), (6), and (7) are applied to equation (4) we get:

$$\theta \frac{d}{d\lambda'} (p_r) = -\theta\beta' \frac{\bar{G}Mm}{r^2} + \theta\beta' \frac{p_\phi^2}{mr^3} \quad (8)$$

and θ cancels leaving:

$$\frac{dp_r}{d\lambda'} = -\beta' \frac{\bar{G}Mm}{r^2} + \beta' \frac{p_\phi^2}{mr^3} \quad (9)$$

which is the same as equation (4) except for the primes, thus showing that equation (4) is scale covariant. Equation (3) may be dealt with similarly.

In Dirac (1973) a slight modification of Weyl's scale covariant theory was introduced in order to consider the possibility that the "constant" G of universal gravitation varies with time. In Canuto et al. (1977) a slight modification of Dirac's theory was introduced. See the article in *Science News* (1978). Equations (3) and (4) are the non-relativistic limit of the equations for particle motion given by Canuto and Dirac. In that the introduction of a time variable G in a haphazard fashion may violate the principle of conservation of energy [Bishop and Landsberg (1976)] care must be taken in considering what the correct equations of particle motion are. Canuto et al. (1977) show that energy conservation is satisfied by their equations, hence by equation (3) and (4). Introduction of these equations is really of little consequence unless an interaction besides gravity, say electromagnetism, exists which "breaks" the scale covariance. In the context of such a theory, b would be a slowly varying function of time. Its variation would lead to a difference between gravitational or Einsteinian units giving time intervals $d\bar{\lambda}$ and "atomic" units giving intervals $d\lambda$. NASA has been sponsoring attempts to detect these differences, equiv-

alent to a time variability of G , using Viking Mars lander data. See Canuto, Goldman, and Shapiro (1984).

An intriguing possibility, which has occurred to me is that the Coulomb force, when added to equation (4), is added without the factor of b which is present in front of the gravitational force term. The equation would then serve as a mold for atomic and nuclear interactions, in which Coulomb forces are dominant over gravitational ones. Scale invariance would be broken in a way which is equivalent to a time variation of Coulomb's constant $k = 1/(4\pi\epsilon_0)$ where ϵ_0 is the so called permittivity of free space. Although the Viking lander data show that any time variations must be small at present, it would seem that episodic or transient variations in b may have occurred in the past and are not ruled out. Canuto et al. pointed out that no present day accepted theory exists which tells us explicitly what b should be; thus we are free to describe transient episodes in the behaviour of b . Such a transient could possibly have occurred at the time of the Genesis Flood, in accordance with God's intervention. Morton (1983) has discussed the effect that an expansion caused by variation in K would have on the earth's geology, and Unfred (1986) has discussed related matters. J. Baumgardner has done some similar work (private communication). This variation in k would be related to God's ultimate purpose, a subject not overlooked by Wheeler.

Miracle of Existence

Wheeler puzzled over the miracle of existence. He mentioned the unbelievable miracles that occur as nature awakens at the start of every day. He puzzles over the so-called anthropic principle: is the universe adapted to man? He wonders whether life could evolve unless "meaning itself powers creation." He quotes Weyl: "Is it conceivable that immaterial factors having the nature of images, ideas, building plans also intervene in the evolution of the world as a whole?" This brings a chuckle from creationists who are familiar with the passages from the Gospel of John quoted at the start of this review. Creationists know that the meaning which created the universe also sustains it. They know that life is a miracle and not an accident. They recognize that an accident requiring the supposed billions of years of evolutionary chronology is an accident nonetheless, and an unbelievably improbable accident. They need no contortions of the mind to simply believe the Word of God. Contortions may come in trying to find scientifically valid apologetics, but the Christian knows that he lives by faith. The non-Christian unfortunately may not realize that he is exercising faith in baseless philosophy where he thinks he is being "scientific."

As a further example consider Wheeler's discussion of the continuum of numbers. He quotes L. E. J. Brouwer: ". . . there is no evidence supporting the belief in the existential character of the totality of all natural numbers." Weyl is also quoted, stating that belief in, among other things, irrational numbers such as π ". . . taxes the strength of our faith hardly less than the doctrines of the early Fathers of the Church. . . ." In light of this, creationists may be thankful for the recent series of articles by Robert A. Herrmann (1985-1986). Herrmann discusses infinite series of propositions, Godel's incompleteness theorem, "the N-world," the

"D-world," and related topics. He seems to confirm some of the things Weyl or Wheeler said while rejecting others, based on recent findings in mathematics. For example— Herrmann (1986, p. 195) states that:

. . . intuitive methods utilized for any scholarly discipline that employs the basic notions of the natural numbers cannot be specifically described by means of one fixed set of rules taken from any L(D).

At the same time Herrmann's articles contain paradigms showing the consistency of the doctrines of the early Fathers of the Church.

In conclusion, let us realize that it is an error to think that there is a principle outside of God that compels Him to act in a certain way— see Tozer (1961, p. 93). These remarks are certainly not meant to condone such an error but to attempt to provide description using God's laws of physics. Jesus is Lord, hence the author of physics.

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Marginalia. Natural Science in the 1830s: The link from Newton to Darwin. By K. S. Thompson. 1986. *American Scientist* 74:397-9.

Reviewed by Walter E. Lammerts*

In this article Professor Thompson proposes that while it is fascinating to trace how Charles Darwin assembled the empirical evidence for his theory, it is important to know how Darwin came to think about the nature of scientific explanation and the problem of determining cause in the context of the 1830s. Here his autobiography is quite explicit. He states that he read with

profound interest Humboldt's *Personal Narrative* and also Sir J. Herschel's *Introduction to the Study of Natural Philosophy*. In fact this book stirred up in young Darwin a burning zeal to add even an humble contribution to the structure of natural science.

So then Darwin was more than just a gifted amateur collector and naturalist when he left Cambridge and joined the Beagle on its famous voyage around the world. By the 1830s naturalists were aware of a historical progression in which one branch of study after another had been gathered securely into the realm of science. Thus Herschel defines science as of two sorts: "the knowledge of reasons and their conclusions, constitutes abstract (science) that of causes and their effects and the laws of nature, natural science." The basis of abstract science was language, mathematics, and logic. The model of all science was the synthesis of astronomical laws such as those of Kepler with Newton's mechanics. Lyell's *Principles of Geology* was just being published (1830-33) and Darwin read both volume I of Lyell and Herschel the same year. Biological science was paradoxically half within the realm of science and half without. Thus Swainson was an amateur naturalist who had traveled to Malta, Sicily, and Brazil. In his *Preliminary Discourse on the Study of Natural History* (1835) he wrote:

All branches of natural science, however varied may be their materials, have but one and the same object in view— the discovery of the primary laws of nature.

These laws were, however, to be sought as evidence of the works of God. Scientists of our Creation Research Society would have no quarrel with such an objective.

MacLeay in his *Hora Entomologicae* (1819-21) proposed that all nature is organized in schemes of five intersecting circles. The animal and plant kingdoms each consist of five classes, each class has five orders, and so on. Certain groups, however, fall between rather than within the circles. Now these circles touch or insculcate. Such a group would be the barnacles falling between the Radiata, such as the corals, and the arthropods which include the insects and spiders. Darwin was much intrigued by MacLeay and his work on barnacles, a truly classical osculant group which was an exercise in formulating a scheme of descent by branching as opposed to MacLeay's static circles.

Then there was William Lawrence surgeon extraordinary to Queen Victoria. He wrote *Lectures on Physiology, Zoology and the Natural History of Man* in 1819. He maintained that life was no more than an assemblage of all the functions and therefore totally dependent on the organization of the body. Yet he also wrote that reflection, judgment, memory, or even the contraction of a muscle could not have arisen out of changes we call chemical or electrical. The explanation of this apparent discrepancy is that he did not wish to get bogged down in the various English and French concepts called the electro-chemical doctrine of life. He was also intent on getting the notion of the soul out of the province of the physiologist, for it "rests on a species of proof altogether and different. . . An immaterial and spiritual being could not have been discovered amid the blood and filth of the dissecting room." Lawrence then goes into great detail in assembling examples of the range of natural variation of human

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racers. He also rejects the idea that the differences are due to the direct effects of environment which acting on men originally alike affected the color of the skin especially and were then transmitted to the offspring and were gradually increased through a long course of ages. He rejects this by the observation that different groups in the same general climatic regions may be lighter or darker skinned, taller or shorter, straight or curly-haired. He also argues from observation that the effects induced during the lifetime of a single individual are not inherited, and that all acquired conditions of the body whether produced by art or accident, end with life of the individual. He also notes that many physical traits such as the Hapsburg lip are inherited and so argues that the alterations of the original color, form, and other properties of the body due to the law of transmission to the offspring, are the sources of varieties in man and represent a single species. Here again is a conclusion with which we as modern scientists would agree. Lawrence unlike Darwin does not connect environmental processes with natural selection. Though Lawrence admits that any person believing that a watch was formed for the purpose of showing the hour, would also believe that our stomachs were made for digestion, yet he quite correctly pokes fun at those who carry this idea to such an extreme as to claim that the tides of the ocean are designed to bring our vessels safely into port.

About this time Herschel, an astronomer, wrote discussing induction. Whenever a new phenomena occurs the first thing to consider is its "explanation, or reference to an immediately producing cause." If that cannot be done the next thing is to generalize the phenomena and include it with others similar to it in hopes that in a more advanced state of knowledge an adequate natural cause may be found. Such a cause must be competent under different modifications to produce a great multitude of effects, besides those which originally led to the discovery of it. The third step in any analysis of cause is then to show that the cause actually is responsible for the effect. This last step is the crucially difficult one that many biologists, and certainly Darwin, have to make. It is one thing to test a cause through experiment, but quite another to find the cause of a historical phenomenon. As the author says:

One can put a mouse in a bell jar and test whether it dies from lack of oxygen. But what is the cause of extinction of the woolly mammoth or of the origin of a new species? (p. 399)

In this respect Darwin's argument follows this three-fold pattern. He first establishes the existence of a

cause, natural selection, then its competence, and finally its responsibility for the origin of species. In his argument Darwin relies heavily on "the certain fact that species do change," and on the analogy of change under domestication. This concept that species change* is of course one which I totally deny, and also insist that the changes brought about by man in animals under domestication are harmful ones which would not allow the animal to exist under natural conditions. Furthermore Darwin fails to note that the variations which he uses as a basis for his theory are harmful ones—we call them mutations now. Thus as shown in Lammerts and Howe (1974) Plant Succession Studies in Relation to Micro-evolution, whatever natural selection was observed actually restricted the amount of variation, bringing populations back to the typical or normal form during years of moisture stress. In spite of many years of effort evolutionists have failed to show that there is any tendency for species to gradually change by the accumulation of variations. The explanation as mentioned above is that all mutations are either neutral in regard to giving the individual plant or animal having them any advantage or in most cases actually harmful. Thus to the best of my knowledge in spite of years of study of *Drosophila melanogaster* not a single advantageous mutation has been found.

By 1856 when Darwin started writing his book on natural selection as being the cause of the origin of species Herschel's book had been thoroughly debated. Darwin especially was impressed with Herschel's proposition that:

it is not possible to satisfy ourselves that we have arrived at a true statement of any law of nature, until setting out from such a statement, and making it a foundation of reasoning, we can show, by strict argument that the facts observed must follow from it as a necessary logical consequence and this, not vaguely and generally, but with all possible precision in place, weight and measure. (p. 399)

It is regrettable that Darwin did not really follow this advice for had he done so we would have been spared all these years of argument about natural selection being an effective cause for the origin of species.

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*Some creationists claim that frequent change occurs within kinds which allows much broader limits of change than at the species level (Editor's note).

QUOTE

Does one ever fall on one's knees as a result of courses one is taking or research one is conducting in psychology, sociology, philosophy, physics, biology, or any other academic discipline? Can one imagine David, Paul, Augustine, Chrysostom, Teresa not falling on their knees, not shedding tears, not smiting their breasts "with groanings that cannot be uttered"? And if it be retorted that I am here confusing the life of faith with the life of reason, then the question becomes: Supposing one starts with a student or scholar who falls on his knees, sheds tears, and smites his breast, do these courses and researches after he has gone through them for ten or twenty years, stultify or enhance the life of his faith?

Malik, Charles H. 1984. Faith and reason in the university. *Modern Age* 28:316

BOOK REVIEWS

Studies In Creation, by John W. Klotz. 1985. Concordia Publishing House, St. Louis. 215 pages. \$9.95 pb.

Reviewed by John R. Meyer*

Studies In Creation is a highly readable, popular survey of the problem of origins from a creationist perspective. Klotz writes both as a competent biologist and a highly respected theologian. As such, he brings to the discussion considerable insight from historical theology and philosophy of science. As a professor at Concordia Seminary for many years he writes with considerable authority, especially in the chapters on "Science and Religion" as well as "Creation in Scripture and Confessions." His strong historical perspective derives in part from the considerable time he has spent visiting and studying key places in Darwin's life, including retracing many of his journeys on "the voyage of the Beagle."

The author deals with the weaknesses of macro-evolution from a fairly standard creationist position. Nevertheless he does plow some new ground in sections such as those relating to animal speech, molecular biology, the supposed pre-human fossils, and the origin of life experiments.

Klotz carefully evaluates not only the problems facing evolutionists, but also problems facing creationists. While not all creationists would agree on the magnitude and extent of these problems, a careful reading of this section will provide interesting food for thought and suggest some fruitful areas of field and laboratory research which members of the Creation Research Society should consider in the years ahead. For example, Klotz sees the data on biogeography (geographical distribution of plants and animals), the mass extinction/death star scenario, and continental drift theory as a problem for creationists but also notes that these ideas may not fit neatly into many aspects of macro-evolutionary theory either.

The book is disappointing in its lack of a comprehensive index but the references at the end of each chapter provide the interested reader with a wealth of documentation and potential source for additional in-depth studies. For example, the chapter on "Problems for the Evolutionists" ends with 117 references. This documentation, alone, is well worth the price of the book. This book is especially recommended for the non-specialist. However, even the seasoned creationist will find much here to stimulate thought.

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Adam and Evolution, by Michael Pitman. Introduction by Bernard Stonehouse. 1984. Baker Book House, Grand Rapids, MI. 268 pages. \$12.95.

Reviewed by Wayne Frair*

This book by a Cambridge (England) biology teacher is a "herald" of better days for science. Starting as a "devil's advocate for the creationist view," Pitman comes, "though not according to any particular creed,"

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(p. 254) to the final explosive paragraph in which he can say with confidence that:

... the direction of the argument is clear— there has been neither chemical evolution nor macro-evolution. Nor, as some 20th century churchmen bio-illogically accept, did God involve chance mutations in "creation by evolution." (p. 255)

Obviously written by one trained in science (particularly biology), the work covers a broad range of topics including body structure and function, biochemistry (especially DNA), genetics, philosophy, fossils, and anthropology. There are 40 helpful figures, references at chapter ends, a four-page glossary, two pages of topical readings, and a seven-page author/subject index.

A four-page "Introduction" was written by evolutionist Bernard Stonehouse, who concludes by saying:

He [Pitman] may even convince you, as he has convinced me, that some fundamental truths about evolution have so far eluded us all, and that uncritical acceptance of Darwinism may be counter productive as well as expedient. Far from ignoring or ridiculing the groundswell of opposition to Darwinism that is growing, for example, in the United States, we should welcome it as an opportunity to re-examine our sacred cow more closely. Somewhere between us may lie the grain of truth that we would all be better for knowing. (p. 12)

Until I comprehended the author's apparent purpose, it impressed me as somewhat strange that although the book represented well what could be considered the essence of a "creationist" message, this being that a supernatural God created diverse types of completely formed and functional organisms, there are very few references to creationists or their writings. Frank L. Marsh, Walter E. Lammerts and Robert Gentry, for example, are referred to briefly; and the aid of R.E.D. Clark is acknowledged at the end. There are some creationist books (including Marsh, Morris and Wilder-Smith) in the reading list. But most of the cited literature is from popular scientists and evolutionists.

At the beginning Pitman presents macroevolutionary viewpoints and contrasts creationist positions on the various topics. Although the work generally is a third-person presentation, the author's position becomes increasingly clear, for as the writing progresses, creation, including teleology (design) assumes ascendancy. The eye appropriately is used as an outstanding example of design. The author says that for the sake of argument orthodox large time scales are accepted. This is a minor matter in this book because Pitman feels that design is the crux of the issue.

In expressing a creationist position Pitman refers usually in general terms to archetypes which would be the natural or "supreme" or "basic" units of creation. These archetypes have experienced permutations which "are capable of generating, without phylogenetic relationships, the diversity of biological forms we see today" (p. 38). More popular creationist terms for the basic groups would be kinds, baramins, prototypes, or natural groups. But in addition to a body plan of a

basic taxonomic group Pitman also uses archetype for an "ideal or fundamental structure common to organisms at molecular, cellular, organic or phenotypic levels" (p. 257). For example, retinal (a light-sensitive chemical in the eye) and DNA are archetypal molecules; three germ layers (triploblast) of an embryo is an archetype. Also the growing regions (meristems) of plants, their leaves, animal feathers, hair, scales and bones are archetypes. A flower is a composite of other archetypes.

I think the concept may be compared with a prefabricated house (the main archetype) consisting of parts (modules, or smaller archetypes), the "permutations" being mutations or changes in the specific smaller archetypes. The concept is consistent with what creationists have been maintaining for many years.

Although this book authoritatively is written, I did notice that the author reechoes the common error of portraying Linnaeus as one holding a "fixity of species" position. This was true only of Linnaeus's early life, because later he recognized some variability among species. Sometimes in the book Pitman uses informal or folksy expressions (as once calling *Archaeopteryx*, "Archy"). This practice sometimes distracted me from the seriousness of the issues, but for some readers it could function as welcome casualness in a profound discussion.

The book does not supply answers for many origins questions, but it has an important message aimed at encouraging belief in the Generator rather than just the gene and at depicting all biotas as consisting of unrelated groupings. Read this book; sell it; donate it! Give it to your science-trained friends (Christian and non-Christian) especially those who are hesitant about accepting a creationist position. Every library used by scientists and students of science should have at least one copy.

The Semantic Theory of Evolution, by Marcello Barbieri. 1985. Harwood Academic Publishers, NY. 200 pages. \$39.00.

Reviewed by Theodore P. Aufdemberge*

The opening words of the Foreword by Rene Thorn are, "Marcello Barbieri's book reads like a novel." I believe this is an accurate description because Barbieri personifies nature. Perhaps it would be more accurate to say he defies nature, i.e.,

The cycles of life were . . . inventions of nature. (p. 155). Nature had to invent the most sophisticated molecular machine that has ever been assembled . . . , the ultimate result of all the molecular engineering that Nature has put into life. (p. 75). I assume nature tried all sorts of experiments in this direction. (p. 121). Nature had created a masterpiece of cellular engineering. (p. 126)

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Secondly he uses an historical approach when describing the various theories he presents. Thirdly the fact that he breezily dismisses commonly taught notions and lists things that are problems for evolution. This gives the work a sense of lightness one might find in a novel. In spite of this, Marcello Barbieri's book is not particularly easy to read. It demands a fairly good knowledge of molecular and cell biology in particular and the history of evolutionary thought in general. If one is well read in this subject, the names he drops from Aristotle to Wickramasinghe lend familiarity to his account. If not it may at least lend an air of credibility to the work.

Marcello Barbieri believes that the evolution of life from the Cambrian period to the present is well documented in the fossil record. He believes that since the evolution of life itself and the origin of the first single-celled microorganism is not documented by the fossil record it must be treated on a theoretical basis alone. He thus centers his book on the review of the many different theories and scenarios that have been proposed for the origin of life, finds them wanting, and proposes his own theoretical model. Last of all he proposes an additional mechanism for the evolution of life forms that he sees documented in the fossil record. His mechanism is "adaptation to natural cycles."

The first portion of the book, pages 1-109, is a review of the history of the idea of evolution, the geological evidence for a primitive reducing atmosphere, a rehearsal of the theories of sudden life, biochemical arguments for evolution, and a concise, easily followed description of four of the five theories that try to explain the origin of precellular life. Throughout this part of the book Marcello Barbieri describes fairly each theory and then explains why he thinks the theory is faulty. He does this, I believe, to give weight to his own theory which he calls the "Ribotype Theory of Origins" of life and the cell.

The last and main part of the book is less lucid and more ponderous than the first. Perhaps I made this judgment because I have not done enough reading in cell biology and biochemistry. Chapter seven is titled the "Ribotype Theory of the Origins" of life and chapter eight "The Ribotype Theory of the Cell." In these chapters Barbieri describes his version of pre-cellular evolution. He claims his theory is different from those which have been proposed up until now not just in detail but in principle. He maintains that in previous theories proteins, genes, viruses, or minerals have played the critical role in evolution while in his evolutionary process it is played by ribosoids. (Ribosoids are Barbieri's term or molecules which contain the sugar *ribose*, i.e., RNA, ATP, etc.) "Furthermore," says Barbieri,

I gave the name ribotype to the system formed by all the ribosoids of a cell, and proposed the Ribotype Theory' on the basis of two concepts: the cell is not a duality of genotype → phenotype but a trinity of genotype → ribotype → phenotype, and that life on earth originated with the ancestors of the ribosome, not the ancestors of the genes.

The second point is that the trinity, genotype → ribotype → phenotype is not a repetition of the Central Dogma, DNA → RNA → Proteins,

because the RNA of the Dogma is messenger RNA, not ribosomal-RNA. (p. 110)

The author's concept of precellular and cellular evolution can be summarized: elements → molecules → aminoacids → ribosoids → nucleosoids → heterosoids → microkaryotes. The microkaryotes de-evolved into prokaryotes on one hand and evolved into microeukaryotes on the other. The latter incorporated small prokaryotes to become protista which during the later part of the Precambrian evolved into the plant, fungi, and animal kingdoms. He claims the later occurred through the:

adaptation to natural cycles in the first place and adaptation to the environment in the second place . . . The two primary mechanisms of modification are evolution by natural conventions in the first place and evolution by natural selection in the second place.

To find out how this all happened you will have to read pages 110-170.

If Barbieri accepts the "Big Bang to Man" notions of "megaevolution" in principle, why should a creationist even bother to read it? First of all, I believe creationists should be aware of what the evolutionists are writing today. While they agree in principle they disagree in particular. The first half of this book certainly brings this out. This book will inform you of many of the different ideas that are or have been part of the search for solutions to the problem of the origin of nature as we know it today.

For example in the chapter "Theories of Sudden Life" Barbieri reviews the ideas of cosmic, planetary, and directed panspermia. These are variations on the belief that life did not evolve on earth nor was it created on earth but rather it appeared on earth suddenly because it was introduced from outside the earth. The ideas of panspermia are not widely accepted or discussed today. Yet references to panspermia occur often enough that a creationist should be aware of these theories. This chapter will also give you insight into why Bruno is now being held up as a hero and why he is mentioned in the same breath as Galileo when the church and Christian creationists are being pilloried.

Secondly the book has several very good diagrams. Figure 5 on page 39 simplifies terms like Archeozoic, Cenozoic, and Protozoic. Figures 8-11 illustrate the different family trees that are the result of the four different theories of cellular evolution which Barbieri finds wanting. Figure 12 illustrates the phylogenetic tree which would result from his own ribotype theory. These drawings and the accompanying text point up problems with the theory of evolution that are seldom if ever discussed in the popular press.

Thirdly the author gives scientific and logical reasons why the theories proposed up to now are invalid at worst or weak at best. It is encouraging to see an evolutionist admit to these weakness in the theory of evolution, most of which have been pointed out by creationists. It is discouraging, on the other hand, to note that he does not reject the notion of simple to complex evolution but merely proposes still another mechanism to achieve the same result. In this respect the book is a disappointment.

Evolution: The Challenge of the Fossil Record, by Duane T. Gish, Creation Life Publishers, El Cajon, CA, 1985, 277 pages. \$7.95.

Reviewed by W. H. Rusch, Sr.*

Basically, this is not a new book, but rather a considerably expanded third edition of a previous work entitled *Evolution: The Fossils Say No!* As such it generally covers the same subject matter as the other two editions of its predecessor. Dr. Gish begins this edition by demonstrating in the first chapter that the question of macroevolution belongs more in the realm of philosophy than in that of science. Of course most evolutionists stoutly maintain that the latter view is correct.

In the next chapter, Gish delineates and defines the two basic theories of origins of living things, creation and evolution. Regrettably, Dr. Gish does not consistently use the term macroevolution rather than the almost meaningless term *évolution*. (The use of macroevolution in this article is the reviewer's) After a brief discussion of the two theories, he refers to them as the creation model and the evolution model. Gish then proceeds to make some predictive statements based on each. These results are summarized in the form of a table at the end of this chapter.

It is interesting to note how Darwin's later use of his concept, gemmules, as an explanation of the origin of variability came about. Actually Darwin was forced in his later years into practically abandoning natural selection. This resulted from Fleeming Jenkin's pointing out in his famous article in the *North British Review* that new forms would be swamped out as time went on. Of course any breeder could have enlightened Darwin on this fact, but he never seems to have checked this out until Jenkin's criticism appeared. This state of affairs, of course, would not support natural selection as an originating process. Hence, Darwin was forced to revert to the use of a form of Lamarckism, and therefore his gemmules came into use in his later editions.

In third chapter, Dr. Gish deals with the question of time and the geological column. He rightly points out the implications for any evolutionary theory of the devastating situation presented by the Cambrian fossil evidence. In the rocks of the Cambrian period we find fossils representing all of the major invertebrates, yet without any of the required precursors. This is also true with regard to some of the vertebrate groups.

It should be pointed out that not only do we find the Arthropoda, a very complex group, appearing in the Cambrian, but we actually find the most complex representatives of the Arthropoda, the Trilobita, also appearing in this early first paleozoic period. The extremely complex structure of the trilobite compound eye has been especially referred to in recent years. So we pass from practically no fossils in the previous period, to the sudden appearance of an organism with an eye as complex as that of the trilobite. This certainly is a situation that confounds the imagination to explain on any macroevolutionary basis.

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The next two chapters deal with the many transitional forms required of the macroevolutionary theory to explain the development of life from microorganisms to fish and in turn from fish to mammals. The author deals with many of the examples referred to in the usual macroevolutionary literature and provides analyses of these various arguments. In chapter five, for example, he discusses the recent announcement of Gingerich's discovery of the proposed transition form between whale and land mammal. Also in this same chapter he deals with the well-known and often discussed horse series. 'Archeopteryx' also comes up for discussion in this chapter.

In chapter six, Gish examines the evidence for human evolution. He begins with an examination of the theories of the origin of the old and new world monkeys. This is followed by the proposed origins of the anthropoid apes, terminating with origin of man. All of the latest finds, e.g. Lucy, KNM-ER 1470, etc., are discussed in this chapter. *Homo erectus* and other examples of *Homo* are also presented.

Finally, in the last chapter, Gish summarizes the various items of supposed evidence for macroevolution that he has discussed up to this point. He concludes, as have many other creationists, by quoting G. A. Kerkut's well-known conclusions which he stated in his last chapter, on the last page, in the final paragraphs from his *Implications of Evolution*. Kerkut does not even grant macroevolution the status of a theory, but consigns it to the ranks of a working hypothesis, no more.

From a mechanical standpoint, Dr. Gish has provided his readers with a glossary, a subject index, an author index, and an illustration index. A minor point, unfortunately the type styles and the arrangements of various sections are not always in harmony with that of most professional works, e.g. Michael Denton's *Evolution: A Theory in Crisis*. Nevertheless, this reviewer highly recommends this work.

Creation and the Modern Christian, by Henry M. Morris. 1985. Master Book Publishers, El Cajon, CA. 266 pages. \$8.95.

Reviewed by William E. Stillman*

As with many others in the creationist movement, this reviewer has been so encouraged and intellectually stimulated by Henry Morris' writings as to be wildly partial to any new contribution of his. To further enhance this bias I shall always fondly remember the occasion when Dr. Morris tried to induce me to join him on the VPI civil engineering faculty from another academic position I held at the time. Still I consider this newest of his books to be a significant contribution to the growing body of creationist literature.

The primary emphasis is to appeal to Christians to take seriously this issue of creationism vs. the conventional wisdom of the scientific establishment. Much of his argument was presented some years ago in *The Twilight of Evolution*. Nevertheless the points have been improved and reinforced through the years of exercise. Especially noteworthy is the observation that Scripture repeatedly emphasizes two evidences of

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God's sovereignty and loving plan for the human race—the Creation and the Resurrection. (Actually the Lord Jesus' Second Advent constitutes the third evidence he discusses.) Most Christians are quite sensitive to any effort to spiritualize or otherwise downgrade the authenticity and meaning of the Resurrection. The same attitude should prevail in our understanding of the Creation.

In his list of negative effects to be attributed to the sway of evolutionary philosophy, one notes two which may be a little less familiar to the average person. Morris shows that the predatory racism of the last century and rapacious capitalism of many greedy entrepreneurs can both be laid at the feet of Darwin's theory, which provided a convenient excuse for the sinful activities associated with them. An interesting tidbit is the reference to the Professor Edwin O. Wilson of Harvard, the socio-biologist, who states that he was a fundamentalist Southern Baptist before encountering evolutionary teaching at the University of Alabama.

Those who are scientifically oriented may be more excited by the latter portion of the book, in which Morris discusses some of the latest trends in the fields of origins and points out their increasing conformance with the creationist position. Some points will be covered in the general order of his presentation. First is the continuing assertion that the second law of thermodynamics is in complete conflict with any notions of progress à la evolution, chemical, biological, or otherwise. The dissipative structures of Prigogine seem to have no theoretical or mathematical basis in fact, except wishful thinking, and the appeal to open systems (the earth open to energy from the sun) is futile. John Ross of Harvard states that "there are no known violations of the second law."

The whole field of evidences is so depleted that we now have Mark Ridley of Oxford reporting that there are just three arguments left: "the observed evolution (variation) of species, . . . biogeography, and . . . the hierarchical structure of taxonomy." These are just as much theological arguments as proofs, and indeed Stephen Jay Gould and others take this approach in arguing that defects and deficiencies constitute proofs of natural selection.

A good deal of space is given to discussing the big bang theory and the increasing difficulties it is encountering. The inflationary universe theory is the latest effort to resolve conflicts which appear irreconcilable. Arguments against the big bang include its contradiction of the second law, violation of the law of conservation of angular momentum, and the non-homogeneous distribution of background radiation. An additional argument of the reviewer is the point that matter in a gravitational black hole cannot cross the Schwarzschild radius, even in a big bang.

It is interesting to note how rapidly the uniformitarian convention of geology has been replaced by the catastrophism now in vogue. From the mechanics of evolution we have almost overnight turned attention to the dynamics of extinction. Note the spate of articles in the popular press speculating on the time and cause of near-instantaneous dinosaur extinction. It is mentioned that Steven Stanley and others have their cake and eat it too by marrying the theories of punctuated equilib-

rium and evolutionary stasis. So things happen very quickly but still take billions of years.

While catastrophism may be congenial to Marxists, like Gould, it of a certainty is more consistent with the Flood theories first popularized (in the modern era) by Whitcomb and Morris and subsequently enhanced by many others. The author brings us up to date on the latest geological findings which tend to support Flood geology.

Reviews of scientific trends such as this invariably direct one to consider the growing list of "proofs" for evolution which once were solemnly accepted by the intellectual community and instilled into every school-child's thinking, but have now been abandoned, or soon will be. Consider, for example, embryological recapitulation, the horse, the expected complete fossil record, uniformitarian geology, mutations as a basis for natural selection, the primeval soup (no longer glibly assumed to be alkaline), overthrusts, and protein analogies (the similarities between humans and primates become increasingly insignificant statistically).

This book is a worthy addition to every serious Christian's library. I only wish that it had been composed on a word processor. The ragged and inconsistent margins provide a disconcerting note unworthy of the quality of the content.

The Fourth Day, by Howard J. Van Till. 1986. William B. Eerdmans Publishing Co. 286 pages. \$9.95.

Reviewed by Don B. DeYoung*

This book's title refers to the creation of the heavens. Dr. Howard Van Till is an astronomer/physicist at Calvin College; his clear writing style reflects a successful teaching career. A Christian Reformed heritage is evident in the theology presented and in the selection of references.

Van Till promotes what is sometimes called the "Double-Revelation Theory." Scripture and science are said to answer separate questions about God and His Creation. Physical properties (elements), material behavior (stellar evolution), and cosmic history (big bang) are taken as the exclusive domain of science. Biblical authority is limited to God's relationship with mankind and His rule over the Creation. Science and Scripture are seen as incomplete revelations in themselves; each fills in the gaps left by the other. This view has been fully discussed and criticized in J. C. Whitcomb's *Origin of the Solar System*. Van Till chooses to call his position one of "categorical complementarity." He also coins the term "creationomic science" to emphasize that God directly involves Himself in every aspect of nature. Excellent material is presented concerning God's governance of every process in the universe. The Lord does indeed sustain all things by His powerful word. The Creation is more than origins—the physical universe is the Creation.

What does Van Till actually do with the days of creation? He concludes that they should be taken seriously, but not literally (p. 83). Surprisingly, he believes that Genesis was never intended to teach anything about the details of cosmic history. "Genesis 1 shows not the slightest interest in natural science,

ancient or modern" (p. 81). The creation chronology is relegated to a non-literal packaging of the real message: God's covenantal relationship with man. The fourth day of the creation week is seen as an incidental poetic/artistic reference, and no more. The book title may thus be somewhat misleading in its emphasis. Many scholars would challenge Van Till's position that Genesis 1 is poetic and not historical. Also, the double-revelation approach inevitably leads to problems with other details of Scripture. Not explained is the physical significance of the curse, or other Scripture references to the Genesis chronology. Adam and Eve are not mentioned, but mankind is assumed to have biologically evolved, ultimately from stardust (p. 187). The present seven-day week is credited to almost any ancient source except the Biblical pattern (p. 25). The author is apparently forced to this conclusion by his denial of any historical basis to Genesis 1. Van Till explicitly rejects the traditional day-age position (p. 84) and theistic evolution (p. 265); the first because it reads too much history into Genesis and the second because it leaves God out of some aspects of nature. As might be expected, the author is intolerant of the literal six-day creation view. He consistently refers to creation science within qualifying quotes, and describes the view as a blind alley (p. 77), an emaciated and theologically barren view of creation (p. 226, 241), and a travesty of natural science (p. 246). Those of us who are committed to a recent creation are accustomed to verbal abuse!

Van Till works through the usual scenario of stellar evolution as might be presented in an introductory astronomy course. A better term might be stellar degradation or decay. Stellar evolution refers mainly to the aging of stars. Their origin is treated as incidental and inevitable, though in reality the spontaneous formation of stars remains a major problem. Graphical data is presented showing the apparent transition of main sequence stars to red giants within star clusters. This result is used to promote a multi-billion year age for such clusters. Now certainly the cluster stars formed at about the same time (no argument here!), and the more massive ones *may* have aged rapidly and left the main sequence. However, long stellar time scales are based entirely on the computer simulation of nuclear reactions, certainly subject to many uncertainties. Does the gravitational collapse of stars remain a possibility for their energy source and their decay? Van Till promptly rules this out, since such collapse could *only* keep the sun shining for 50 million years or less. That is simply too short a time for the standard evolutionary view. There is no mention of observed star color changes over a rapid period of centuries (Sirius B, Betelgeuse, FG Sagittae, etc.) which seriously challenge the theoretical rates of star aging. Current astronomy will hopefully provide more data on the rapid decay of stars.

Bible-science writing has long been duplicated and dominated by the fields of biology and geology. Astronomy needs to be addressed in detail, especially the many recent discoveries and their interpretation. Secular astronomy has boldly moved into the arena of theology, across an entire spectrum ranging from Eastern mysticism to the Anthropic Principle. *The Fourth Day* is one important contribution, demonstrat-

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ing the position of a spokesman for the American Scientific Affiliation. Hopefully the issues raised will cause all creationists to sharpen their own thinking and writing in astronomy.

Evolution as Entropy: Toward a Unified Theory of Biology, by D. R. Brooks and E. O. Wiley, 1986. The University of Chicago Press, Chicago. 335 pages, \$25.00.

Reviewed by Emmett L. Williams*

The authors take a broad swipe at creationists in the first paragraph of the book.

That organisms have evolved rather than having been created is the single most important and unifying principle of modern biology. Theories regarding the causal mechanisms of evolution are not so important in "proving" its reality. The fact that scientists put forward theories means that they accept this reality. Confused creationists frequently think that if they can "disprove" Darwin's theory of natural selection they can "disprove" evolution. But of course this is untrue—even if they succeeded they would only be disproving a theory and not the process. The importance of such theories lies in the fact that theories provide a framework for interpreting the results of the evolutionary process. Thus, any theory of importance should be closely scrutinized because it affects the way evolutionary biologists conduct their research. (Preface, p. ix)

The statement that creationists think they can disprove Darwin's theory of natural selection is not referenced and this is unusual for a book that is quite well-referenced. This reviewer knows of no creationists who say that they can disprove either Darwin's theory of natural selection or macroevolution but he knows many creationists who claim that natural selection is defective as a mechanism for macroevolution.

Brooks and Wiley attempt to combine evolutionary development with the second law of thermodynamics, certainly a worthy goal. Creationist scientists have pointed out many times that this law of science is opposed to molecules-to-man evolutionary development. It is refreshing to see evolutionary scientists face the degenerating effects predicted by the second law and try to square their philosophy with known science rather than deny that there is no conflict. Actually the authors claim that as entropy increases, biological evolution occurs ("biological evolution is an entropic process").

They state that a new mechanism for macroevolution is needed because:

1. Evolutionary theory has never fully come to grips with the underlying causal laws of chemistry and physics.
2. Developmental biology has not been successfully integrated into the theoretical framework.
3. Existing evolutionary theory has failed to provide a rationale for the existence of higher taxa (groups of species produced by descent) that is consistent with our knowledge of phylogeny and population genetics.

4. Existing evolutionary theory has failed to provide what we would consider to be a robust explanation of the relationship between form and function in evolution.

We do not believe these shortcomings are resolvable within the current theoretical framework. We seek to provide a new framework, one that will incorporate certain parts of the old framework and include those aspects of evolution not now adequately explained. (p. 3)

Chapter 2, Why Entropy?, opens their formal discussion of thermodynamic principles. Unfortunately some serious technical mistakes are made. Closed and isolated systems are considered identical (p. 27). Also it is stated on the same page that the energy content of an isolated system can decrease ($\Delta E < 0$). Unfortunately anyone familiar with thermodynamic methodology may be turned off very early in the book. The introduction of unthermodynamic language may offer considerable confusion. "Species, as living systems partly closed in terms of information and cohesion but open in terms of energy, . . ." (p. 42). Thermodynamic systems cannot be viewed as "partly closed." It appears in subsequent pages that the authors open and close systems as the need arises to explain various concepts.

The gist of imagining macroevolution with increasing entropy is revealed in pages 54-7. Use is made of the Boltzmann formulation:

$$S = k \ln w$$

where S = entropy content of the system,

k = Boltzmann's constant and

w = number of possible microstates of the system.

As w increases, entropy (S) increases. Consider the expansion of an ideal gas (expansion of any gas spontaneously occurs, thus entropy should increase). The change in entropy, ΔS , is determined by:

$$\Delta S = k \ln (w_2 / w_1), \text{ where } w_2 > w_1 \text{ and } \Delta S > 0$$

since the gas in the "expanded" state has more microstates (w) available to it. If a conceptual framework can be constructed to take advantage of the above entropy increase, one may visualize increasing entropy in any process.

Note how this is accomplished:

As this system moves farther away from equilibrium, it will produce entropy if it accesses new microstates while retaining its historical access to the initial microstates. In such a case, we would find an increasing number of microstates accessed, and hence the macrostate would be an increasingly probable system. However, because the system would retain its historical access to initial microstates, it would be accessing an increasing number of microstates in an aperiodic, increasingly reproducible, manner. (pp. 55-6)

Obtaining increasing evolutionary order with increasing entropy is accomplished by definition! "Entropy production in systems moving away from equilibrium involves increasing organization and decreasing periodicity." (p. 56). Actually the living systems discussed in later pages do not move away from thermodynamic equilibrium; they start in a nonequilibrium (already-ordered) state. Then the terms historical and dynamic

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entropy (Hollinger and Zenzen, 1982) are employed. Historical entropy remains constant with time as dynamic entropy increases. Rigorous thermodynamic entropy is not considered. Finally evolutionary necessity (increasing complexity) has triumphed over increasing entropy (increasing disorder). Such "processes" are purely imaginary, neither natural nor thermodynamic.

Brooks and Wiley realize the ambiguous usage of the word order and often employ complexity to refer to the statistical entropy of the system and organization to refer to the information content. Other interesting comments by the authors concerning their model of evolutionary development are as follows: "Evolution is survival of the adequate not the most fit." (p. 71). Ontogeny involves self-imposed organization. (p. 81).

Evolution is indeterminate as far as the future is concerned, even though evolutionary trajectories we see today have been determined by past trajectories. (p. 129)

Sudden appearances rather than gradual development of evolutionary change are expected. (p. 131). Information emerges from an evolving system, it is not forced on it. (p. 295). No teleology or vitalism is necessary in the theory. (p. 297).

The authors conclude by stating:

Our view of biological evolution suggests that it is an inherently nonviolent, accomodating process . . . We have no strong metaphors to offer such as "survival of the fittest" or "Nature red in tooth and claw" and that is just fine with us. We would like nothing better than to make sure that violent human behavior could no longer be justified and condoned

as an unalterable consequence of an evolutionary legacy. (p. 307)

The attempt by Brooks and Wiley to have macroevolution conform with the second law of thermodynamics results in conforming the second law to evolutionary necessity (increasing complexity and organization). Rigorous thermodynamics is not part of their theory. Also the authors do not deal with origins (typical of most macroevolutionists). They begin with nonequilibrium systems and evolve other nonequilibrium systems. The discussion of the origin of original order is avoided. See Williams (1983). Most of what is discussed by Brooks and Wiley can apply very easily to conservation and maintenance processes in living organisms. See Williams (1981).

As macroevolutionists discover more and more problems with their philosophy hopefully they will attempt to scientifically legitimize their ideas. To square macroevolution (philosophy) with the second law (science) is an admirable goal. Brooks and Wiley tried, but their arguments are more philosophical biology rather than rigorous thermodynamics.

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LETTERS TO THE EDITOR

Creation Science, Taxonomy, and Fossils

I would like to make some brief comments on two recent Quarterly articles by E. Norbert Smith (CRSQ 22:105-7) and George F. Howe (CRSQ 22:141-2). The theme of Dr. Smith's article is somewhat in line with that of Dr. Howe's in many respects, especially the concern which both authors project about the image of creation science, which has reached something of a watershed. To most mainstream scientists and the public education establishment, creation scientists often appear as narrow minded fundamentalist "religionists" who publish religious/pseudoscientific books and journals lacking in true scientific objectivity. Howe correctly and forcefully reminds us that in the field of origins, we must separate science from religion in our scientific writings if we are to lift the impact of scientific creationism upon the minds of the public, educators and other scientists.

All too often creationists are charged with religious subjectivity because in many of our scientific articles we rely on Biblical support for a particular theme. Items No. 2 and 5 in Dr. Howe's letter are excellent examples of the pitfalls into which creationist writers can fall. Six days of creation and the Flood of Noah are two cases where it is all too easy to fall back on the Scripture, even when we are directing our work to non-religious scientists or educators. Any valid and truly objective scientific merit in our papers often goes down the drain like the baby and the bathwater.

It is true that many orthodox scientific papers are also subjective due to philosophical preconceptions but I agree fully with Dr. Howe that while we obviously cannot shut out our firm Christian convictions, separation of purely scientific and religious studies must be maintained if we are to increase our influence in an increasingly secular world. Probably the answer would be separate publications—one espousing a Christian/scientific approach for that audience which is religion orientated, and the other a purely scientific approach for other scientists and educators. The cost factor of course would be a formidable barrier but it still could remain as a longer term goal.

I also liked Dr. Smith's comments on the need to re-evaluate taxonomy, especially in the field of fossils. To my mind, evolutionist taxonomists are really "feeling in the dark" when it comes to fossil species. Although in most cases a fossil can be readily placed in its correct higher taxon, say order, class and phylum, how can the taxonomist be so sure at the species or genus level? As an example I refer to the dog species *Canis Familiaris* which subdivides into over 150 breeds. In view of the fact that dogs so anatomically different as the Pekingese, the Spaniel, the Bulldog and the German Shepherd are members of the same reproductive unit, how can taxonomists accurately classify fossil species when the reproductive factor is unknown? Given such large variability factors in the morphology of known, living forms it may well happen

that many fossils, because of considerable differences in shape, size and other physical features are classified as separate, evolving species, thus creating erroneous "lineages."

In conclusion I wish to refer to the "molecular clock" so heartily embraced by many evolutionist biologists such as Stebbins and Ayala (pp. 59-60). By comparing the genetic material of various living organisms, evolutionists allege that they can establish phylogenetic relationships and times of divergence. Inherent in their work is the *essential* assumption that the constancy of change (mutations) is more or less even over time. This essential assumption appears to be flatly opposed by living fossils such as the Coelacanth fish, morphologically unchanged since Cretaceous times (70 million years BC), the beakhead reptile, the tuatara (130 million years), the Metasequoia conifer (20 million years) and many others. If mutation rates were fairly constant why have these living fossils stubbornly refused to evolve?

Another strong objection to the constancy rate is that if it were true, then evolution must have been slow and gradual whereas the fossil record overwhelmingly shows the sudden appearance of virtually all life forms, and the virtual total lack of intermediates. It would also be extremely interesting to make a genetic comparison between the Coelacanth and other modern fishes, as the Coelacanth is supposedly "primitive" compared to modern fish, yet it is at the same time a modern fish itself! In view of the above strong objections from the fossil record, it would seem that constancy of change is an illusion and therefore that the molecular clock is useless in respect of times of divergence of types from alleged common ancestors.

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Flaw in Expanding Earth Model

David Unfred's article (CRSQ 22:171-179) promoting an expanded earth model, has the same flaw in it that we creationists see in many evolutionary theories. It has no mechanism. We fault the Big Bang idea because no one can even dream of a method of producing it. Some of us discount the continental drift idea because there is no way to produce it. (Circulating currents in the mantle are insufficient and besides there is evidence against their existence (CRSQ 18:235)). We reject the idea that one creature can evolve into another because there is no mechanism that can do such a thing.

Unfred stated, "Whether the motor of this Earth expansion was miraculous or naturalistic is not the concern of this presentation." Should not a mechanism be at least suggested before one embraces a theory as being true? Unfred claims that there are Biblical evidences for an earth expansion model. But are there evidences against it?

He uses a Figure 8 to demonstrate the original position of the land masses on a smaller diameter earth. It would seem that if that figure were true, then

Antarctica should now be located in the center of the Pacific Ocean. Although how an expanded Antarctica could be close to Western North America and Africa at the same time is unknown.

Unfred stated, "As expansion continued, gravity would dominate and the earth's curvature would change with the expanding radius." But would gravity change the curvature of the crust? As an orange grows its surface curvature continually changes. But can a 40-mile thick rock crust do the same as it expanded outward? If gravity did perform the task, would not the crust crack in millions of places? Or did the crust soften somehow until expansion was complete and then reharden?

Supposedly the greater thickness of continental sediments compared to ocean sediments is evidence for the expanding earth model. But cannot circulating currents set up by the escaping waters of the "fountains of the great deep," as suggested in the article "How the Flood Altered the Earth" (CRSQ 18:118-126), have accomplished the same thing?

Unfred quoted Morton suggesting that the expansion was caused by each individual atom expanding. But if that were the case, would not the ratio of land to water remain the same and therefore no problems are solved?

Also promoted in Unfred's article is the idea, supposedly derived from Scripture, that with the absence of rain in the antediluvian world, the pre-Flood flora was watered by dew rising from ground. But what has been missed is Genesis 2:10 which reads, "And a river went out of Eden to water the garden." Here we are specifically told that the river watered the pre-Flood flora. It was *not* the dew. The mist of Genesis 2:6 is said to water the face of the ground. The *face* is just the surface and thus the mist would never have met the total needs of the flora. (See, "How the Flood Altered the Earth" CRSQ 18:118-126)

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Is There an "Empty Place" In the North?

Introduction

Have astronomers found a unique direction in space which might indicate the location of Heaven? This is a recurring idea, occasionally finding its way into print (Zodhiates, p. 2). Apparent support for a unique physical position in the sky is found in Job 26:7a, "He stretcheth out the north over the empty place (KJV)." Just what is this empty place or void? The answer is surely of special interest to pastors and others as well. Any explanation must involve the study of both Scripture and astronomy.

Job 26:7

The word "north" in the Job passage, "saphon" in Hebrew, has two major interpretations (DeYoung 1983). The first view might be called the celestial view. This traditional approach identifies saphon with the sky, in parallel with other Old Testament passages which tell of God stretching out the heavens above the earth. The Job context does indeed emphasize celestial phenomena. However, one must question the idea that Job 26:7 refers to a certain localized direction in space.

Instead, saphon more naturally refers to the broad northern heavens in general. Most renditions of Job 26:7 capture this understanding:

He stretcheth out the north over the empty place, and hangeth the earth upon nothing (KJV).

God stretches out heaven over empty space, and hangs the earth upon nothing (Living Bible).

He spreads out the northern skies over empty space; he suspends the earth over nothing (NIV).

He stretches out the north over the void, and hangs the earth upon nothing (RSV).

He stretches out the north over empty space and hangs the earth upon nothing (Berkeley).

The northern skies he spreads oer empty space, and hangs the earth on nothing (Moffatt).

He stretches out the north wind upon nothing, and he upon nothing hangs the earth (Septuagint).

God stretched out the northern sky and hung the earth in empty space (Good News Bible).

He it was who spread the north above the void, and poised the earth upon nothingness (Jerusalem Bible).

The northern direction may have been emphasized because of the apparent motion of all other stars around the stationary point in the north sky, presently Polaris, resulting from the earth's rotation.

There is a second possible meaning of the north, saphon, in Job 26:7. This view does not take saphon as referring to the sky at all, and might instead be called the terrestrial approach. It involves a picturesque mountain on the far north coast of the Mediterranean Sea. This snow-covered peak was known in Job's day as Mount Saphon, the same word translated as "north" in Job 26:7. In Canaanite mythology, Saphon and similar mountains were considered to be special meeting and dwelling places of the gods, including Baal. Thus the possibility arises that Job 26:7 could be expressing a great truth: God created even the mountains of the alleged gods by His power. Thus, no evil forces of earth or heaven above have any existence co-eternal with God. Whether the reference is to a celestial or to a terrestrial location, Job 26:7 is an intriguing verse. Continuing study of Scripture and the evaluation of ancient literature may better define the meaning of the word saphon. In either the celestial or terrestrial case, the use of the verse as a compass pointing toward a localized place and identifying it as Heaven is unwarranted.

Astronomy

Zodhiates (p. 2) has suggested that the region of the sky under consideration centers in the Orion nebula. Orion is a constellation of bright stars that dominates our winter sky. Within this well-known stellar group, there is a beautiful cloud of colored gases. Trillions of miles in diameter, the hazy nebula sparkles with hundreds of additional imbedded stars. On a clear night, binoculars are sufficient to reveal much of the exquisite detail of the Orion nebula. Is there a special reason why such grandeur is lavished on this particular span in the heavens? One might quickly and correctly answer that every part of the sky has a special glory of its own. In addition, the singling out of the Orion nebula as a "void" related to Job 26:7, is invalidated by

three observations. *First*, Orion is not a northern constellation! Most of the Middle East, just as most of the United States, lies between 30° and 40° north latitude. Since Orion is located over the equator, it is actually a southern constellation for these regions. Orion's declination is between -8° and +7°. It appears high in the southern evening sky for half of each year and is invisible in the daytime sky the rest of the time. *Second*, the Orion Nebula is neither a void nor a vacuum, but is instead beautifully filled with stars. Bright gaseous nebulae such as this are not all unusual. They are observed in abundance in all regions of the sky. There is no particular significance to the display in Orion. *Third*, the belief that Orion surrounds a unique empty place in the sky demonstrates a limited view of the size of the universe. The Orion Nebula is about ten thousand trillion miles away (1600 light years). However this vast distance is comparatively small. Our own Milky Way galaxy has a diameter of 100,000 light years, sixty times greater than Orion's distance. Orion, as well as every other bright nebula and star in the night sky, is actually our next-door neighbor! And beyond the entire Milky Way, billions of other galaxies extend outward in all directions. To look for a unique location in Orion, so "close to home," neglects the majesty of the entire universe.

Interestingly, there have been recent scientific announcements concerning newly-discovered voids in space. Kirsher (p. 2) describes one example beyond the direction of the summer constellation, Bootes, a vast region large enough to contain a billion galaxies like our own Milky Way. However, this finding certainly does not support the idea of an empty place in the north. As with the Orion Nebula, this region is not completely vacant; it simply contains fewer stars and galaxies than expected on a statistical basis. Also, as in the case of Orion, the stars of Bootes cannot be said to be located in the north. Instead, this star group appears nearly overhead in the 30°-40° band of latitude. Silk (p. 12) provides another reference to voids in space, involving multiple bubble-like regions with fewer galaxies than expected. Apparently, galaxies are *not* distributed uniformly throughout space as previously expected. Instead, there is a certain "clumping" of galaxies together. The creationist might have predicted this since it fits the overall pattern of the physical universe. From elementary particles to clusters of galaxies, matter is sorted out into an ever-increasing hierarchy of complexity:

sub-quarks	planets
quarks	solar system
protons, neutrons,	star clusters
electrons	
atoms	galaxies
molecules	galaxy clusters
compounds	galaxy super-clusters

This discontinuity of matter on the microscopic and macroscopic levels casts basic doubts on a uniform big bang origin of the universe. It certainly is *not* evidence for a special location of physical emptiness in the northern skies.

Whenever "recent disclosures" of science are used to unlock the secrets of Scripture, one should immediately be suspicious. After all, history chronicles the continual debate over scientific ideas. All scientific pronounce-

ments are tentative and temporary. With an infinite amount of data to consider, nothing can really be known absolutely on the basis of natural science alone. Unfortunately, false and uncertain science continues to be used in an attempt to bring drama and enticement into Scripture interpretation. The false announcement that computers had detected the "long day of Joshua" is one such example (Whitcomb, p. 364). The long day was real; the alleged scientific verification was not. Another case was the predicted 1982 line-up of the planets which was to have ushered in the tribulation period (DeYoung 1980, p. 350). In our present discussion, the conclusion is evident that telescopes have not found physical evidence for the location of Heaven. Heaven may indeed exist in the northern direction, or in a distant region of the universe, or in another dimension altogether. An empty place in the night sky is not needed to locate Heaven; instead, one must look inward. Heaven is found by replacing the emptiness within the human heart with the Creator's presence.

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Thundershowers

The mini-symposium, "Summer Afternoon and Evening Thunderstorms: A Teleological Approach," was excellent. Having lived in cooler northern summers most of my life, I am amazed and thankful for the cooling effects of the afternoon thunderclouds even when there is no accompanying rain. As the five articles so well demonstrate, this is a wonderful provision of our Creator.

Do the skies themselves send down showers?
 No, it is you, O Lord our God.
 Therefore our hope is in you,
 for you are the one who does all this.
 — Jeremiah 14:22b

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Chance, Luck, & Randomness

The Creation/Evolution debate has suffered a lack of clarity regarding the definition of three key terms: chance, random, and luck. The Random House Dictionary gives the following meaning for these terms:

1. *Chance* — the absence of any cause or series of causes of events as they actually happen that can be predicted, understood, or controlled: often personified or treated as a positive agency— without plan or intent.

2. *Random* — proceeding, made, or occurring without definite aim, purpose, or reason. Haphazard, chance, casual, stray, aimless, fortuitous.

3. *Luck* — the "force" that seems to operate for good or ill in a person's life, as in shaping circumstances, events, opportunities.

It appears that the evolution worldview uses these terms as a "cover" for human ignorance as to why a sequence of events has or will transpire. If man can not understand it— no one can! Random or chance arrangements generally have configurations which are characterized by a lack of structure.

I contend that the so-called random state is the configuration which God allows as the final form of all this material world. The natural world is degenerating and is a vain show apart from relationship to the Eternal One, Jesus Christ, the Eternal Non-corrupting One.

As everything else is delivered over to entropy, that is, the complex moves to the random by God's purpose, we are frustrated in our attempts to worship any created entity either we or God has made. Stand over a junked computer and learn the end of even this wonder! We are faced with either a transcendent non-corruptible God as the source of the temporary improbable complexity or Sartre is correct: the world is absurd.

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Evolution's Revolutions

The rise and fall of the various transformist theories over the years highlights the inadequacies of evolutionist thought. The publication of an interesting article entitled "A New Paradigm for Evolution" in a recent issue of *New Scientist* (Ho, Saunders, & Fox 1986) has prompted me to comment on the rapidly changing evolutionary scenarios over the last 50 years. The latest version of the theory is now so very different from the views strongly held as "gospel" as late as the 1920s.

When the classical Darwinism of gradualism with variation and natural selection began to fade into obscurity in the third decade of this century, it was replaced by the synthetic or Neo Darwinian paradigm which emphasized so-called favorable mutations acted upon by natural selection; and population genetics, genetic drift, etc. This theory in turn began to crumble in the 1970s under the pressure of attacks by paleontologists such as Gould, Eldredge, Patterson and others, including creation scientists. As it became more and more evident from the fossil record that new forms appeared suddenly instead of gradually, the new version known as Punctuated Equilibria or Quantum Leap became the ruling paradigm by the early 1980s. The emphasis on natural selection dwindled and major mutations resulting in saltation type change replaced the more or less minor mutation changes of Neo Darwinism.

However, the main problem with every version of evolutionary theory is the lack of a plausible mechanism. As mutations, large or small, cannot impart new, more complex DNA information to an existing organ-

ism thus raising it to a higher level of complexity, modern biologists, such as Pierre Grasse (1977), are increasingly abandoning mutations as the driving force in evolution. Are Ho, Saunders and Fox proposing some really new revolutionary theory? Not at all! In fact some of their ideas date back to the pre-Christian era but are dressed in new clothes.

Knowing full well that mutations are hopeless and fully aware of the lack of transitional forms in the fossils (Gould 1980 & Corliss 1980), these eminent scientists propose, in suitably elegant scientific language, that matter (including biological matter) somehow organizes itself in certain apparently preferred pathways. Using chemical organization as a basis they go on to say that life and the code are *not* accidents (mutations) frozen by natural selection but are largely the consequences of the stereo-chemical properties of molecules! Also the authors state "biological forms are produced in accordance with the laws of physics and chemistry, just as inorganic forms are." They say the process is not a supernatural one, yet development is a coordinated process in which different parts of the organism adjust to each other in form and function. Large mutations are allowed and they say that Goldschmidt's "hopeful monsters" are considerably more hopeful and less monstrous than commonly believed. Virtually no evidence of substance is given to support the above amazing statement.

Similarities between organisms of different species they say is caused by "similar underlying patterning processes" which seems to imply that certain preferred pathways exist for evolutionary development and to me this is getting dangerously close to directed evolution. They discuss the possibility of "molecular drive" but admit to some problems such as stability or stasis which is overwhelmingly shown by the fossil record. Natural selection, they write, "loses its place as the all-powerful creative force."

Apart from the obvious shortcomings of this "new paradigm" the most interesting aspects of the article are the numerous attacks on Neo Darwinism, some of which are strongly worded. From the creationist viewpoint the article is highly significant. Much creationist criticism of Neo Darwinism is vindicated by the use by the authors of many valid objections previously raised by creationists. At the same time Ho, Saunders and Fox do not really give solid scientific evidence for their so-called "new" theory. The concept of evolutionary drive at the molecular level is hoary with age and actually explains nothing.

The conflict between supposedly constant mutation rates and the glaring opposition to this by evidence of stasis in the fossils and especially the "living fossils" is left totally unresolved. It seems that evolutionists are increasingly threshing about in their efforts to overcome the obvious conflicts, contradictions and puzzles inherent in evolutionist explanations of life. I predict this latest attempt to explain life in naturalistic terms will suffer the same fate as its predecessors.

(For a creationist discussion of so-called chemical organization see CRSQ 22:157-8)

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QUOTE

Buridan's most specific statement occurs in the context of his commentary on Aristotle's cosmological work, *On the Heavens*. Aristotle, of course, insisted on the eternity of motion that was unacceptable to a Christian like Buridan. According to the Christian Creed the world was created in the beginning, or in time, which means that the past history of the universe is finite. The same creed also states that the future history of the universe is also finite. Eternity begins when an end has come to this world. It should also be noted that in 1215, or a hundred years before Buridan, the Fourth Lateran Council made it a dogma that the world was created in time and out of nothing.

All this was in Buridan's mind— and therefore we ought to grasp the full meaning of the statement by which he separated himself from Aristotle on the eternity of the motion of stars:

God, when He created the world, moved each of the celestial orbs as he pleased, and in moving them He impressed in them impetuses which moved them without His having to move them any more except by the method of general influence whereby He concurs as an agent in all things which take place . . . And these impetuses which He impressed in the celestial bodies were not decreased nor corrupted afterwards, because there was no inclination of the celestial bodies for other movements. Nor was there resistance which would be corruptive or repressive of that impetus.

Jaki, Stanley L. 1985. The physics of impetus and the impetus of the Koran. *Modern Age*. 29:154.

QUOTE

If it be said that scientists and scholars have, after all, some kind of faith, the question then is what kind of faith they hold. Probe into their innermost presuppositions, and you will find that, in the final analysis, they rest their faith on some kind of monism, whether of mind, or of man, or of matter, or of force, or of culture, or of what they call truth, which always turns out in the end to be the self-creativity of "the universe" or "the world," or what the medievals called the eternity of "matter." Such monism is the antithesis of faith.

Malik, Charles H. 1984. Faith and reason in the university. *Modern Age* 28:315

SPECIAL FEATURE

RECORDED INSTANCES OF WRONG-ORDER FORMATIONS:
A BIBLIOGRAPHY— PART VII

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QUOTE

The history of American education can be roughly divided into three distinct periods, each representing a particular and powerful world view. The first period— from colonial times to the 1840s— saw the dominance of the Calvinist ethic: God's omnipotent sovereignty was the central reality of man's existence. In the Calvinist scheme the purpose of man's life was to glorify God, and the attainment of Biblical literacy was considered the overriding spiritual and moral function of education. Latin, Greek and Hebrew were studied because they were the original languages of the Bible and of theological literature. Thus, this period in American education is characterized by a very high standard of literacy.

The second period, lasting from the 1840s until about World War I, reflects the Hegelian mindset. G. F. Hegel's statist-idealist philosophy spread throughout the Western world like a malignant spiritual disease, destroying Calvinism. In this pantheistic scheme the purpose of life was to glorify man and the instrument through which man's collective power could be exercised— the state. Hegel dethroned the Jehovah of the Old Testament and the Christ of the New Testament, and offered a pantheistic view of the universe where everything was a somewhat formless "God" in the process of perfecting himself through a dynamic, endless struggle called the dialectic. Yet even the Hegelian period was one of high literacy, for Hegel had stressed intellectual development, since he considered man's mind to be the highest manifestation of God in the universe. Latin and Greek were studied because they were the languages of the pagan classics.

During this Hegelian period the public school movement developed, promoting a secular form of education which gradually eliminated the Bible from the classrooms of America. Discipline, punctuality, high academic standards and achievement were the hallmarks of the public schools.

The third period, from World War I to present, I call "Progressive." It came into being mainly as a result of the new behavioral psychology developed in the experimental laboratories of Wilhelm Wundt at the University of Leipzig in Germany. The major American figures who studied under Wundt— James McKeen Cattell, G. Stanley Hall, Charles H. Judd and James Earl Russell— came back to the United States to revolutionize American education.

In this scheme, the purpose of man's life was to deny and reject the supernatural and to sacrifice oneself to the collective, often referred to as "humanity." Science and evolution replaced religion as the focus of faith, and dialectical materialism superseded Hegel's dialectical idealism as the process by which man's moral progress was made. The word "progressive," in fact, comes from this dialectical concept of progress.

Blumenfeld, S. L. 1985. Who Killed Excellence? *Imprimis* 14(9):3. Hillsdale College, Hillsdale MI 49242.

QUOTE

Western technology, at least in the form which gave in the eighteenth and nineteenth centuries a distinct advantage over the rest of the world, was not a fruit of manual dexterity or a result of socioeconomic pressures. The transportation, electrical, and chemical industry as it developed in the West was mostly the work of engineers well trained in the Newtonian science of motion or mechanics. It was a science because every step in it was in strict order so that the third step or law was inconceivable without the second and the second without the first. The question of why science— a robust, modern science in which one step is not only preceded by another step, but in which one step generates another in a sequence that cannot be stopped— did not arise in the Muslim world, is therefore the question of why the first law of Newton, the law of momentum or impetus, was not formulated in the Muslim world. In still other words, the foregoing question is a question about the history of the theory of impetus in the Muslim world.

Jaki, Stanley L. 1985. The physics of impetus and the impetus of the Koran. *Modern Age* 29:156.

QUOTE

I, for one, take that very seriously. I believe that if you are not looking at life poetically and dramatically then you are not looking at it properly. And this, it seems to me, is also the way Christianity instructs us to look at life. After all, Christianity has come to us as a story, not as a theory or a philosophy or a science. Or perhaps we might say that it is many stories that are part of one vast tale. There is the story of Creation, the story of Abraham, the story of Joseph and his brothers, the story of King David, the story of the Good Samaritan, the Christmas story, The Gospel stories. Moreover, we speak of God as the author of Creation and the author of our Salvation, and sometimes we refer to the drama of Salvation and the part we are meant to play in it.

It is a story of God's goodness but, since it is a true story, it is not an idyllic fable. The Dark Lord plays his part as does the Good Lord. A good story will not exclude the unpleasant side of life. The characters will encounter humiliations, accidents, misfortunes, and sorrows but these calamities serve a purpose and are never without meaning. Indeed the calamity is very often the occasion for the growth or transformation of the story's protagonist. For example, in one of Tolstoy's short stories, a mortal sickness causes Ivan Illych to see his life as he has never seen it before. In Jane Austen's *Persuasion* Louisa Musgrove is transformed into a better person by an accident and her subsequent convalescence. In *Great Expectations*, Pip is transformed by his illness. In *Captains Courageous*, a fall overboard transforms a spoiled child into a loyal friend. And, of course, in the Gospel story, we find that it is through suffering that we are redeemed and the world is saved.

Kilpatrick, W. K. 1986. Why secular psychology is not enough. *Imprimis* 15(4):4. Hillsdale College.

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QUOTE

When a man comes to the point in his life when he begins to ask “What’s the use?” or “What’s the point?” or “What does it matter?” it’s a sign that he has lost the narrative thread of his life. One of the major tasks of Christian psychology is to help him find it again. Christian psychologists are in a much better position to do this than their secular counterparts because they are in touch with a tradition in which every individual life, no matter how desperate and seemingly pointless, can find a place. Christian psychology can encourage people to see their lives as stories within a larger story, to locate themselves within a tradition of people who have been similarly tested. Many life experiences which appear meaningless or accidental from secular perspectives are more properly viewed as points of testing or revelation or transformation from the perspective of the Christian drama. Christian psychology has the task of helping us go beyond the level of merely “working on our problems” or seeing our lives as clinical studies, and on to the level of discerning the distinctive part we are meant to play and the importance of playing it well.

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