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 27 DECEMBER 1990 NUMBER 3

THE CANDELILLA PLANT

EUPHORBIA ANTISYPHILITICA

DESIGN

AND

TYPOLOGY

CREATION RESEARCH SOCIETY QUARTERLY

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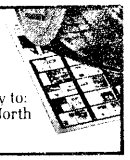

Cover Photographs

A. Candelilla stems are seen in the foreground with yucca and creosote bush behind.

B. Candelilla stems. Flowers can be seen at the tip of these leafless stems.

TABLE OF CONTENTS

MEMBERSHIP/SUBSCRIPTION APPLICATION FORM
CREATION RESEARCH SOCIETY

The membership / subscription categories are defined below:

1. VOTING MEMBER	those having at least an earned master's degree in a recognized area of science.
2. SUSTAINING MEMBER	those without an advanced degree in science, but who are interested in and support the work of the Society.
3. STUDENT MEMBER	those who are enrolled full time in high school or undergraduate college.
4. SENIOR MEMBER	voting or sustaining members who are age 65 or older.
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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 1100 non-voting members. The *Creation Research Society Quarterly* has been gradually enlarged and improved and now is recognized as 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. The Society operates two Experiment Stations, the Grand Canyon Experiment Station in Paulden, Arizona and the Grasslands Experiment Station in Weatherford, Oklahoma.

Membership Voting membership is limited to scientists having at least an earned graduate degree in a natural or applied science. Dues are $17.00 ($21.00 foreign) 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 $17.00 ($21.00 foreign) 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: $20.00 ($24.00 foreign).

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 Cornplexity,* through Zondervan Publishing House, Grand Rapids, Michigan 49506. 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 humans, 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 a historical event worldwide in its extent and effect.

4. We are an organization of Christian men and women 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 Savior for all people. Therefore, salvation can come only through accepting Jesus Christ as our Savior.

Editor's Comments

Please encourage libraries in your area to subscribe to the Quarterly. Your help would be appreciated. *CRSQ* is a reference journal for scientific articles on creationism and its presence in public, college and school libraries would help accomplish this purpose.

Also please send articles, notes and letters on any subject of creationism to me. I wish to have your input into the development of the creation model of science. Instructions to authors are given in each June Quarterly. May each of you have an enjoyable Holiday season.

Don B. DeYoung

DEDICATION TO GEORGE F. HOWE

George Franklin Howe was born in Buffalo, New York where his father was a mechanical engineer and his mother was a pianist. His family moved several times during his early childhood and so he attended grammar schools in Akron, Ohio; Ridgewood, New Jersey and Wyoming, Ohio. His study of science began with bird books, birdwatching, and Thornton Burgess animal stories at the age of nine. He and other members of his family received faith in Christ as Savior when he was nine years old.

He graduated from Wyoming High School after which he majored in botany at Wheaton College, receiving the B.S. degree with high honor. He earned the M.S. and Ph.D. degrees in botany at The Ohio State University where he was a Charles F. Kettering Fellow. His thesis research covered several facets of photosynthesis.

For nine years he served as professor of biology at Westmont College in Santa Barbara, California. Since 1968 he has been Chairman of the Department of Natural Sciences at The Master's College (formerly Los Angeles Baptist College) in Newhall, California where he was twice voted "Teacher of the Year." He has participated in several National Science Foundation Institutes covering the topics of radiation biology, desert biology, and botany.

Dr. Howe is a member of the Society of the Sigma Xi (an honorary research organization), the Southern California Academy of Sciences, and the Creation Research Society since it was founded in 1964. In the Creation Research Society he has held several different board offices. He was elected as a Fellow of the Society in 1989. He has published technical papers on the subjects of photosynthesis, chaparral regrowth after fire,

fossil pollen, quasihuman ichnofossils, and pollination of the camphor weed. He has authored numerous papers on various aspects of biological origins and he lectures widely on the subject of scientific creationism.

Dr. Howe and his wife, Luella, have four children and four grandchildren. He has one brother who is a retired professor from Dallas Theological Seminary, Dallas, Texas. Dr. Howe is active as a deacon in his local Baptist church. His hobbies include studying the Bible, spending time with his family, doing creation field research, photographing plants, and playing the violin.

Wilbert Rusch, Sr., L.L.D.

EUPHORBIA ANTISYPHILITICA (THE CANDELILLA PLANT) DEMONSTRATES PROVIDENCE, DESIGN AND TYPOLOGY IN CREATION

GEORGE F. HOWE* AND EMMETT L. WILLIAMS**

Received 20 April 1990; Revised 13 August 1990

Abstract

Wax produced by candelilla sterns is useful in many ways. These stems also show a complexity of design that fits with the creation view of origins. By analyzing candelilla and other plants in the genus Euphorbia, it can be seen that the Creator has produced many different stem and leaf patterns within the same type, as evidenced by the unique inflorescence called a cyathium.

Introduction

Euphorbia antisyphilitica is a native of Mexico, the southwestern United States, and Central America—Purseglove (1968, p. 139). Its common name is "candelilla." Its species name was given to it by Zuccarini who originally described the shrub in 1829 after having learned that its milky latex had been used widely in Mexico to fight venereal disease — Hedge and Sineath (1956, p. 136). The Creator may have programmed certain plants to yield biochemicals that assist in treating diverse ailments. The tranquilizer industry, for example, was born when pharmacognocists seriously studied the *Rauwolfia serpentina* plant from which people of India for generations had made a tea that calms the emotions. The possible use of candelilla latex sap as a source of drugs against sexually transmitted diseases deserves a second look.

Of even greater interest in demonstrating God's providences is the fact that the candelilla stems exude a useful wax -- (Hodge and Sineath 1956) and Hodge (1955). Arising in crowded clusters, these slender stems

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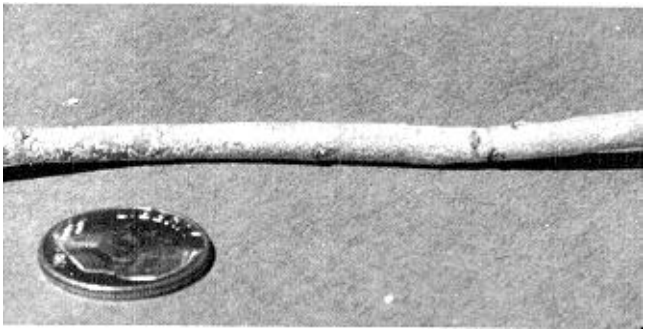

Figure 3. Candelilla stem with U. S. dime for perspective.

are leafless and resemble a little candle as in the common name, "candelilla," see Figures 1 and 2 (Cover photographs A and B). The stems are covered with wax (Figures 3 and 4) which can be removed with a razor blade as seen in Figures 5 and 6.

Candelilla wax is the basis of a migratory industry in Texas and Mexico—Maxwell (1968, pp. 95-99). Donkeys transport the harvested stems to camp where the wax is extracted using portable equipment. The itinerate harvesting of these shrubs had led to the depletion of candelilla; see Hodge (1955, p. 102). The stems are boiled in large water vats to which sulfuric acid is added—Usher (1974, p. 245), Correll and Johnston (1970, p. 965), and Hedge and Sineath (1956). The wax floats to the surface and is skimmed off for further processing and purification. There is about a 3.5% to 5% yield of wax which in 1956 sold for 70 cents per pound—Hodge and Sineath (1956) and Krochmal *et al.* (1954, p. 6). The wax consists of hydrocarbon molecules with chains from 17 to 25 carbon atoms in length, as reported by Balandrin (1984, p. 129).*

Refined candelilla wax finds many uses including the manufacture of waterproof boxes, waterproof fabrics, and sealing wax—Roecklein, (1987, p. 113), Usher (1974, p. 245). When mixed with rubber it is used to make electrical insulators and dental molds. Candles can be made from a mixture of candelilla wax and paraffin. It is also an extender for carnuba wax in producing polishing compounds. Certain factors, including financial constraints, militate against producing candelilla shrubs agriculturally—Hodge and Sineath (1956, p. 154). Yet we believe the possible cultivation of this plant on semi-arid lands warrants further study.

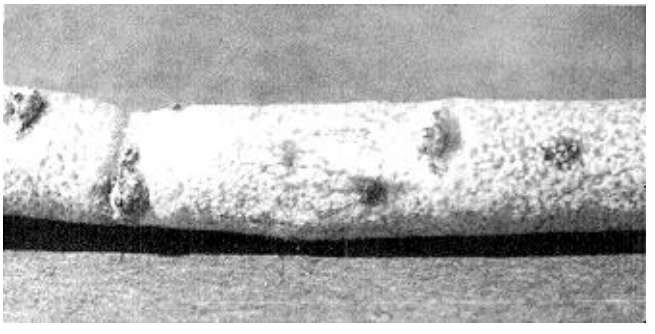

Figure 4. Closeup of the same stem (Figure 3). Note wax flakes on stem surface.

*Recently the authors had the opportunity to visit a candelilla wax extraction facility. See Figures 15-18.

Design

Not only providence but also complexity of design is found when candelilla stems are seen as photographed under the scanning electron microscope.* In Figure 7 a candelilla stem is seen in cross section. It shows that the Creator has endowed these plants with a vascular system that conducts water and dissolved minerals in vessels and tracheids of the xylem. Conduction in plants follows a marvelous design—see Howe (1975a), (1975b), and (1978, p. 17).

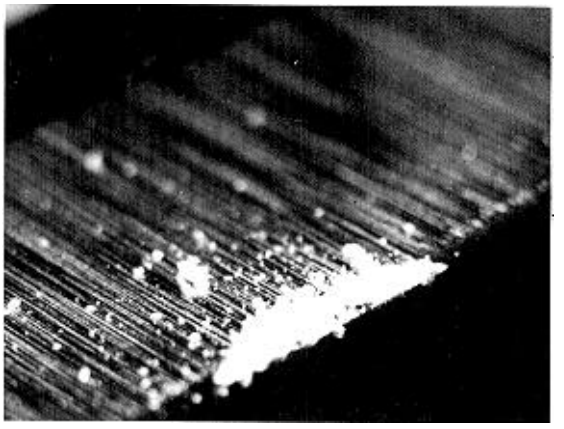

Figure 5. Candelilla wax on a razor's edge.

Figure 8 shows the hairs on the bract below the male flower. Figure 9 is a scanning electron photomicrograph of the stem epidermis after rinsing with acetone to remove most but not all of the adherent wax. Wax is still visible in some areas on the surface of cells. This wax helps conserve internal water during the hot summer days characteristic of the Chihuahua Desert. Plants growing in less stressful environments have been noted to produce smaller amounts of wax.

Figure 6. Microphotograph of candelilla wax.

Higher magnification pictures of the epidermis (Figures 10 and 11) reveal the jewel-like character of the many epidermal cells that secrete the wax. Also visible are guard cell pairs located in sunken areas. They open and close stomate pores that allow for rapid diffusion of photosynthetic gases into and out of the stem. Their sunken position serves as another water conserving feature. In a previous paper we commented extensively on guard cells—Howe, Williams and White (1987).

*Note scanning electron photomicrographs are by Williams (Figures 7-11) while the other photographs are by Howe (Figures 1-6, and Figures 12, 15-18).

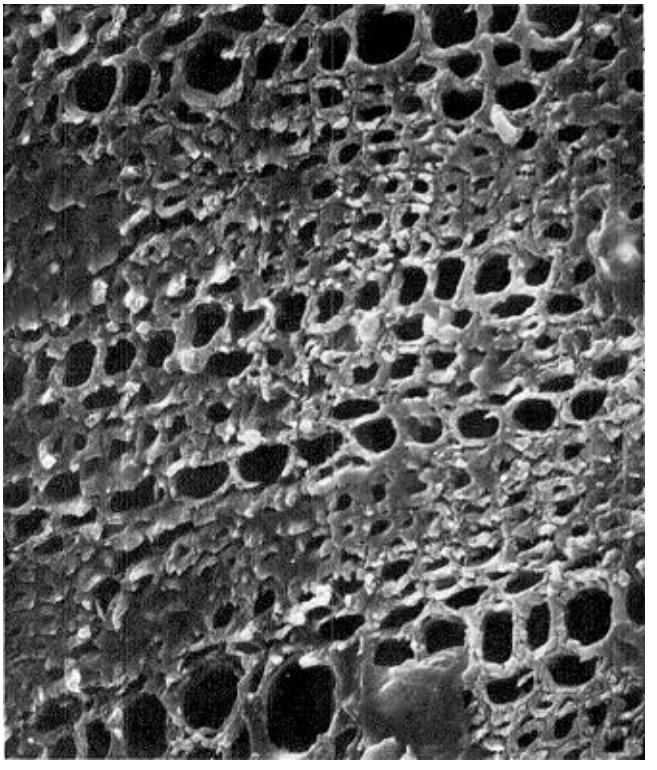

Figure 7. Scanning electron photomicrograph of candelilla stem cross section, approximate magnification 450X. Xylem vessels and tracheids visible.

Guard cells can open stomates in the light and routinely close these same pores in darkness. The guard cell mechanism and the entire epidermis is a tribute to the Designer's skill.

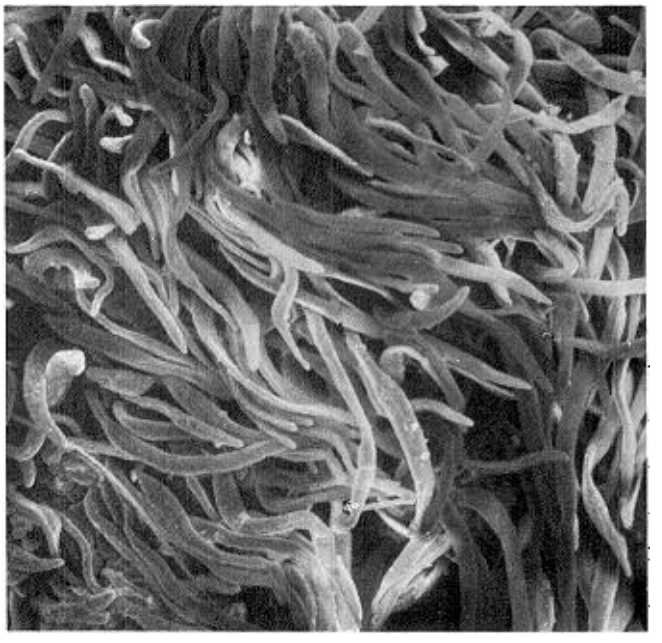

Figure 8. Hairs on bract subtending a male flower -- *Euphorbia antisyphilitica* approximate magnification 140X.

Typology

The study of candelilla plants supports typology which is the recognition that all of the different organisms belonging to the same type manifest specific key attributes of that type. Although representative mammals like the dog, the porpoise, and the bat, for example, differ widely, each fully demonstrates all the characteristics of the mammal type such as hair, three earbones, mammary glands, and relative constancy of body temperature. All of them are fully "mammal" and none of them is half mammal and half of some other type. Michael Denton (1986) has recently noted that typology is strong evidence against macroevolutionist. His book is being increasingly noted in scientific circles. This book presents strong evidence against evolution even though Denton himself is not a creationist.

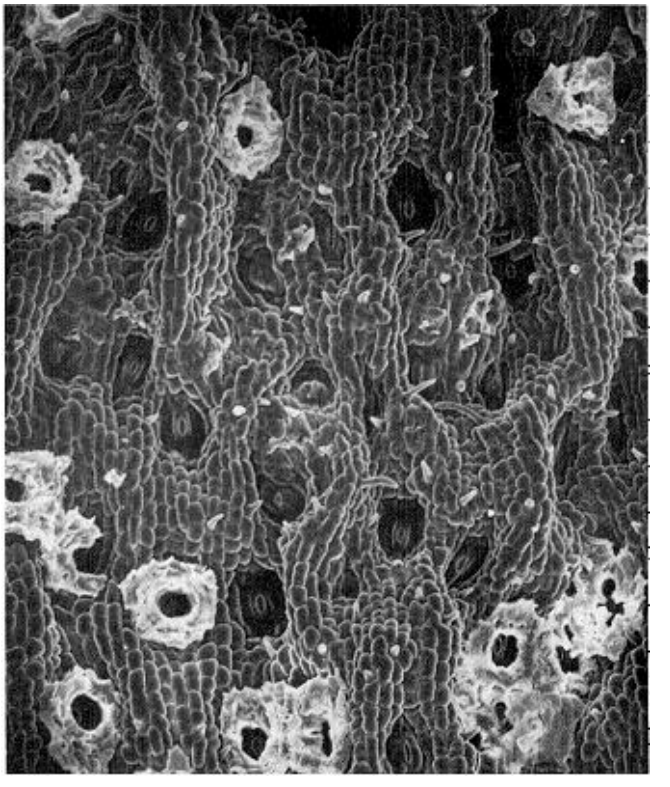

Figure 9. Scanning electron photomicrograph of candelilla epidermis after partial wax removal, approximate magnification 100X. Note circular patches of wax which remain.

Members of the plant genus *Euphorbia* illustrate typology. They differ widely from one another in the form of their leaves and stems but their flowers are uniquely similar. Thus spotted spurge seen in Figure 12, for example, has tiny leaves clustered on vine-like stems that hug the soil while *Euphorbia valida,* a native of South Africa, altogether lacks leaves. It has, instead, a thick, pleated stem which closely mimics the succulent stems of the cacti which are plants of an entirely different family—Figure 13. Like *E. valida,* candelilla stems lack leaves but their thin wax-covered stems are also very different from the cactus-like stems of *E. valida. Euphorbia pulcherrima* (the poinsettia) on the

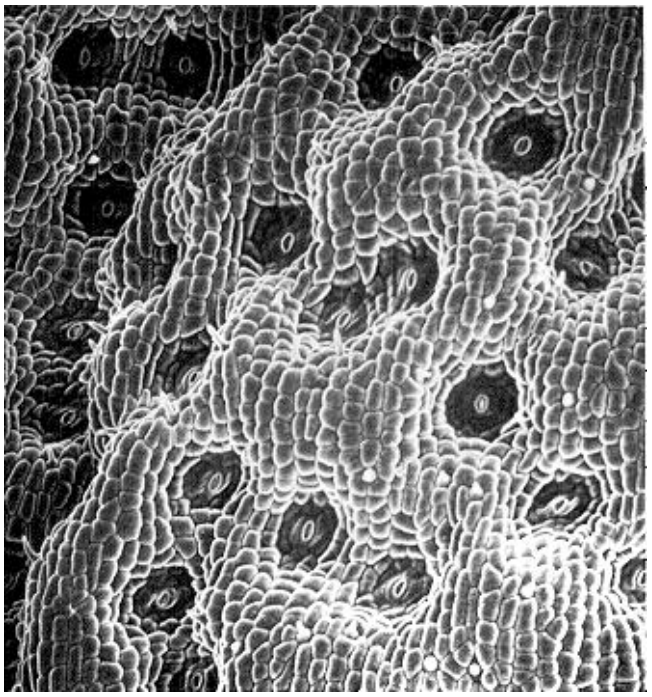

Figure 10. Scanning electron photomicrograph of candelilla epidermis after total removal of wax, approximate magnification 100X. Guard cell paris barely visible in pits.

other hand, has large green leaves borne on the lower portion of its stems and brightly colored red leaves above, near the flowers. Many people wrongly call these red poinsettia leaves "flowers."

In the midst of such great variability of leaves, there are several features which bind these plants together as

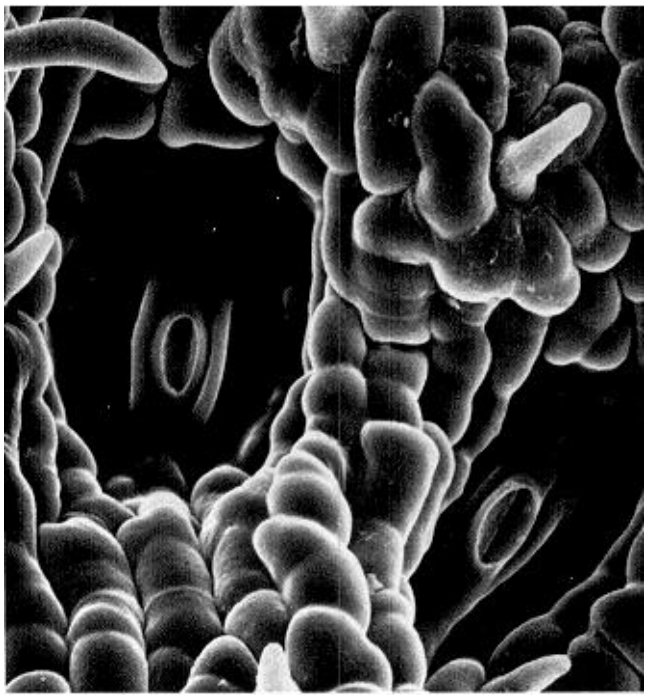

Figure 11. Scanning electron photomicropgraph of candelillla, epidermis -- closer view showing guard cell pairs with stomates closed, approximate magnification 500X.

members of one genus; all members of the *Euphorbia* group have their flowers produced in a distinctive cluster known as a "cyathium." The cyathium inflorescence is a condensed series of flowers that resembles a single flower. It contains a bowl-like involucre that is formed from leaf-like bracts that have fused. Male flowers are hidden from view, attached to the inner lining of the involucre, as seen in the cutaway sketches of Figure 14—Jones and Luchsinger (1979, pp. 278-80), Hickley and King (1981, pp. 242-46), Smith (1977, pp. 161-63), and Bailey (1976, pp. 461, 465).

A single female flower is produced in the center of the cyathium on a pedicel stalk that elongates causing the tripartite ovary to project out from the involucre—see Figure 14. This bizarre flower cluster is found only on plants of the genus *Euphorbia* and nowhere else in the plant kingdom. Every member of the Euphorbia genus, from the lowly spurge to the succulent South African euphorbs, has a cyathium. There is a whole origins position known as cladism and its advocates cling to typology as a fundamental concept. Colin Patterson of the British museum is a cladist who has recently challenged evolutionism.

Figure 12. Leaves and flowers of *Euphorbia paplus,* the spurge. Bottle of correction fluid gives perspective. Note tiny leaves.

A study of candelilla supports the conclusion that the Creator produced plants of widely distinct vegetative form but gave them all the same pattern of inflorescence. The consistency of the cyathium inflorescence structure points toward a creation in which many divergent species were produced separately but each was given the same flower cluster. From the areas of providence, is God, not macroevolution, who deserves design, and typology, itfrontline credit for producing the candelilla and all the *Euphorbia* members.

Acknowledgments

We thank the Research Committee of the Creation Research Society for supplying part of the funding for this research. We thank the donors who have contributed to the C.R.S. Laboratory Fund, interest from which

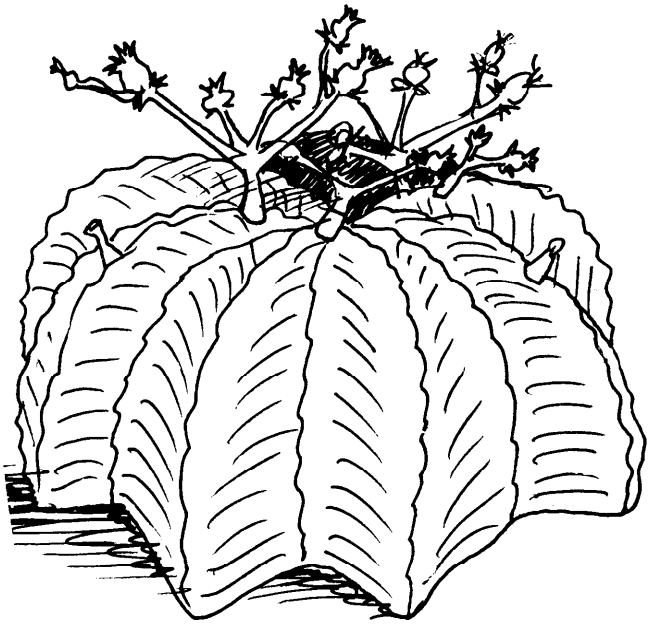

Figure 13. *Euphorbia valida* -- a South African plant lacking leaves and having an inflated stem like a cactus. Sketch by Ross Marshall after Bailey (1976).

is used to perpetuate creation studies. We gratefully acknowledge the help of Ms. Lazella Lawson in securing bibliographic information on this topic, and of Mrs. Phyllis Hughes for preparing the manuscript.

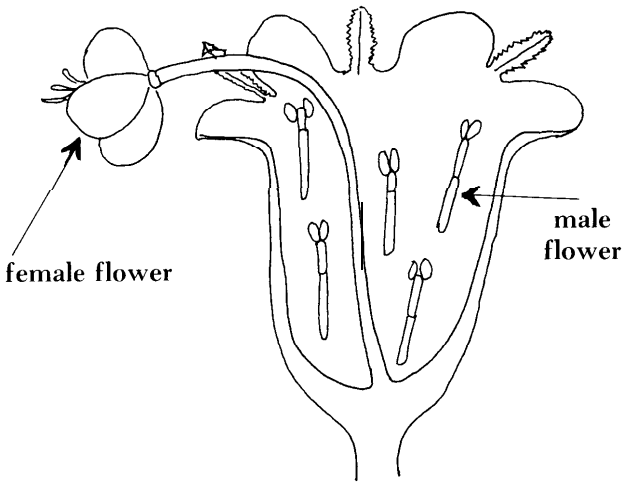

Figure 14. Generalized cyathium inflorescence characteristic of all *Euphorbia* members. Sketch by Howe after several sources.

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Figure 15. Candelilla wax extraction facility. A fire is produced in the pit seen here. Candelilla stems are placed in a boiling sulfuric acid solution above.

Figure 16. Donkeys are used to carry heavy bundles of candelilla stems to form a large pile at the extraction site. This pile contains already processed stems.

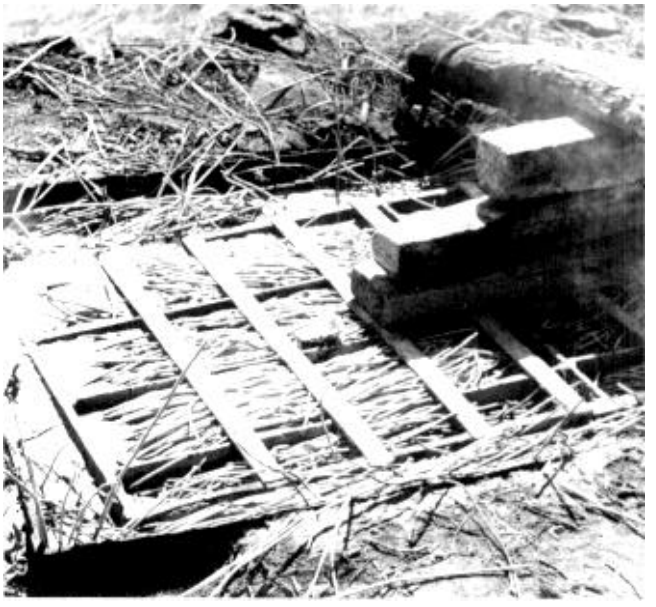

Figure 17. A grate is pressed by a lever to immerse candelilla stems into the boiling acid solution.

Figure 18. The clean wax seen here undergoes further purification before it is employed in the manuffacture of dozens of very useful products worldwide.

THE THREAT FROM THEISTIC EVOLUTION*

PAUL A. ZIMMERMAN**

Received 20 April 1990; Revised 19 June 1990

Abstract

*The so-called position of theistic evolution*** *destroys sound Biblical interpretation and renders a Christian unable to objectively evaluate the evidences against the theory of evolution.*

Introduction

It is no secret that a significant number of individuals who profess the Christian faith has declared the entire creation vs. evolution debate to be pointless. The question of origins is indeed one where scientific theory and Biblical interpretation are tangent. In seeking to avoid any possible conflict between science and theology, some individuals support what is known as "theistic evolution." "Theistic" is a term derived from the Greek word "theos" which means "god. " Thus theistic evolution is God-directed evolution. In a book entitled *The Genesis Connection* (Wiester, 1983, p. 96) the author seeks to resolve the conflict between the concepts of evolution and of creation. Wiester takes the position that the Christian person can accept virtually the entire theory of evolution. The only reservation he must make is that the Christian cannot accept the presupposition that the process happened spontaneously, i.e. by random chance or fortuitous accident. In other words Wiester believes that one may solve the entire problem by simply saying that God is behind the entire process. Thus it would seem the theistic evolutionist would have the best of both worlds.

The Creation Research Society is a scientific society fully committed to the proposition that scientific evidence by itself has demonstrated fatal flaws in the theory of evolution. However, the Society does have a statement of belief which includes the inspiration of the Bible, acceptance of the doctrine of creation, the world flood of Noah, and salvation through faith in Jesus Christ our Savior. These theological truths are

*This is an address given at an open forum during the 1990 CRS Board of Directors meeting in Ann Arbor, MI, April 20.

**Paul A. Zimmerman, Ph. D., P.O. Box 919, Prudenville, MI 48651.

***Editor's Note: The topic of theistic evolution has been explored from various aspects in *CRSQ* articles. A selected bibliography may be of interest to readers who wish to explore creationist reactions to the philosophy.

Armstrong, H. L. 1968. Evolution: theory or myth? *CRSQ* 5:114-15, 119; 1968. Not theistic evolutionists. *CRSQ* 5:118-19; 1969. Theistic evolution and stories. *CRSQ* 7:242-43; 1972. Faith and evolution. *CRSQ* 9:139; 1973. Augustine, Aquinas and origins. *CRSQ* 10:120, 122; 1974. Book review of *God's Method in Creation. CRSQ* 11:170; 1976. An examination of theistic evolution. *CRSQ* 13:108-10; Barnes, T. G. 1987. The dilemma of a theistic evolutionist: an answer to Howard Van Till. CRSQ 23:167-71; Braze, M. W. 1983. Theories of origins: do they persist despite contrary evidence? M. S. Thesis. ICR Graduate School. El Cajon, CA; Clark, H. W. 1971. Was Augustine an evolutionist? *CRSQ* 7:242-43; Haigh, P. 1979. Outline of Thomistic principles on creation that prove the impossibility of theistic evolution. *CRSQ* 15:210-11; Hedke, R. R. 1980. Asa Gray and theistic evolution. *CRSQ* 17:181-85; 1981. Asa Gray vindicated. *CRSQ* 18:74-75; Ingram, T. R. 1970. Augustine not an evolutionist. *CRSQ* 7:185-86; Jones, A. J. 1971. The nature of evolutionary thought. *CRSQ* 8:44-49; Klotz, J. W! 1964. The importance of creationist study. *CRSQ* 1 (Annual): 6-9; Morris, H. M. 1972. Theistic evolution. *CRSQ* 8:269-72; Niessen, R. 1980. Several significant discrepancies between theistic evolution and the Biblical account. *CRSQ* 16:220-21, 203, 232; Rushdoony, R. J. 1965. The premises of evolutionary thought. *CRSQ* 2 (2): 15-18; Tinkle, W. J. 1975. Theistic evolution. *CRSQ* 12:126; 1981. Intelligence rather than struggle. *CRSQ* 18:163, 167

among the presuppositions we accept as religious truths. Thus it does not seem inappropriate to examine briefly the threat posed by theistic evolution.

It is helpful to ask why it is that some Christians believe that they may embrace theistic evolution. I am convinced that the principal reason lies in capitulation to the claims of the proponents of evolution. Theologians, who usually are unable to understand the scientific evidence, are overly impressed by the claims of evolutionists. Since it is promoted in the name of science, they assume it must be correct. Therefore they feel they must accommodate their interpretation of the Bible to evolution. They feel that it is naive and behind the times to insist on a creationistic interpretation of the Bible.

Theologians, Evolution and Inspiration

In my opinion this willingness to surrender has its roots in a departure from a solid view of the inspiration of the Holy Scriptures. The Bible is regarded as a human book, written by men who were limited by the crude science of their time. Such theologians believe that God indeed has placed spiritual truths in the Bible, but these truths are mixed with old and faulty views concerning nature. For example, Dietrich Bonhoeffer, the German theologian who was executed under Hitler's reign, wrote an essay on creation. In this essay he says,

> To the extent that his word is the word of man, the Biblical author was limited by his time and knowledge; and we dispute this as little as the fact that through this word only God is speaking to us of His creation (Bonhoeffer, 1959, p. 28).

When Bonhoeffer (1959, p. 49) discusses the Garden of Eden he writes, "How should we speak of the young earth except in the language of fairy tales?"

Another famous German theologian, Gerhard Von Rad (1961, p. 82), writes, "The notion that God 'built' woman from man's rib gives an answer to the question of why ribs surround only the upper half of the human body rather than the entire body." More recently, Conrad Hyers, an American Lutheran theologian, defended the position that one must treat the book of Genesis as "symbolic" in its nature. He writes, "The crucial question in the creation account of Genesis 1 is polytheism versus monotheism" (Hyers, 1984, p. 43). Hyers does admit that there is some vestige of historical truth in Genesis. For example, he writes, "The Garden of Eden story . . . contains a postulation, if not an ancient remembrance of a food gathering stage which preceded sheep herding" (Hyers, 1984, p. 101). Thus it is evident that the theistic evolutionist usually regards the literary nature of the Genesis account as myth, epic, poem, parable, or saga. In any event the historic approach of the creationist is derided as being "hyper-literalism" (Olson, 1982, p. 30).

The consequences of adhering to theistic evolution are far reaching. Instead of presenting a solution to the conflict, theistic evolution wins approval neither from Christian theology nor from science.

Consider the following sample reactions to the proposal that evolution may be considered as being directed by an almighty Deity. Kirtly Mather states,

> When a theologian accepts evolution as a process used by the Creator he must be able to go all the way with it. Not only is it an orderly process, it is a continuing one. The golden age for men—if any—is in the future and not in the past (Shapley, 1960, pp. 37-38).

What Mather means is that you can forget the theological concept taught by Genesis that Adam and Eve, the first humans, were created perfect and sinless. Instead you must accept the evolutionary philosophy that man arose from the beast with all that that implies. As a consequence, The Apostle Paul's description of the cause of original sin in Chapter five of his letter to the Remans must be rejected. For Paul speaks of the first man Adam who sinned and thus plunged all mankind into rebellion against God. Likewise there would then be difficulty with Paul's doctrine that Christ, the second Adam, redeemed all men by His atoning death on the cross.

Moreover, one finds that scientists who promote evolution are not the totally objective, philosophically pure individuals that some believe them to be. Instead of being willing to concede that one may indeed hold that there is a God who created matter and energy and who directs evolution, many evolutionists insist that such "mysticism" must be rejected. It has to be mechanistic and materialistic in their view. George G. Simpson has judged that,

> The attempt to build an evolutionary theory mingling mysticism and science has only tended to vitiate the science. I strongly suspect that it has been equally damaging on the religious side, but here I am less qualified to judge (Simpson, 1964, p. 232).

Nonetheless it is quite clear that evolutionists have a faith of their own, namely a faith in a totally materialistic process.

Theologians who accept theistic evolution soon display that in most instances their entire theology suffers. For instance Derek Kidner wrote a small commentary on Genesis. His book has much commendable material. Yet Kidner (1967, p. 94) writes,

> If as the text of Genesis would by no means disallow, God initially shaped man by the process of evolution, it would follow that a considerable stock of near-humans preceded first man, and it would be arbitrary to picture them as mindless brutes.

Kidner is also led to deny the universality of the Flood at the time of Noah. He writes, "It seems to follow that the destruction of life was, like inundation of the earth, complete in the relative sense and not the absolute sense" (Kinder, 1967, p. 94).

Messianic prophecy also is placed in jeopardy by the use of methods of interpretation which regard the Bible as a human product written by men who were scientifically the children of their day. For example the Christian Church has long held that Genesis 3:15 is the Proto-Gospel. It speaks of the seed of the woman which will crush the head of the serpent. But Von Rad (1961, p. 82) who does not view Genesis as of historic value, states "The exegesis of the early church which found a messianic prophecy here, a reference to the final victory of the woman's seed, does not agree with the sense of this passage."

Indeed, Hyers (1984, p. 97), an advocate of the symbolic interpretation of Genesis admits, "Symbolic interpretation can easily be abused. On the pretext of extracting their inner secrets, sacred writings can be made to say and mean almost anything."

The theological problem does not stop with the Book of Genesis. When the historical-grammatical method of interpreting Scripture is abandoned, the Biblical miracles are also apt to be denied. This is done on the premise that science does not accept the possibility that God will set aside the laws of nature. I once heard a Christian theistic evolutionist say that the only miracle he could now accept was that of the resurrection of Jesus Christ. When pressed to say why he accepted that one last miracle, he could not reply.

Conclusions

From all this one may conclude that theistic evolution carries a baggage of severe problems. This is not to say that a person cannot believe that evolution was God's way of creating and at the same time affirm Jesus Christ as God-man and Savior But it is obvious that such a position endangers the fundamentals of the Christian faith. Indeed I am also convinced that theistic evolution is not good science. It closes one's eyes to the many-faceted evidence that stands against the theory of evolution. While propagandists for the theory still trumpet the wonders of Darwinism, knowledgeable people are aware that each year brings increasing evidence of the fallacies of evolutionary theory. It is only by a vigorous pursuit of the implications of this evidence that science will be truly served. Likewise, Christians remember the words of the book of Hebrews 11:3, "By faith we understand that the universe was formed at God's command, so that what is seen was not made out of what was visible." And that Christian faith is created, informed, and sustained by the Holy Scriptures, God's inerrant word.

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PANORAMA OF SCIENCE

Reprinted *CRSQ* Volume 2

Introduction

The *Creation Research Society Quarterly* has been published since 1964 (26 complete volumes). Many of the early Quarterlies are out-of-print, yet these past issues contain articles of continuing interest and value. In an effort to make these volumes available, the Board of Directors has incurred considerable expense to reprint them. In order that those interested in good scientific creationist articles, sound criticisms of the evolutionary hypothesis, along with the needed literature citations accompanying the treatises will have a general idea of the contents of each volume, brief synopses will be written to appear in this and future Quarterlies. See Williams, 1990, pp. 57,58 for a synopsis of volume 1.

Six Days or a Compromise

One of the best refutations of the ruin-reconstruction theory (gap theory) I have ever read appeared as the lead article in the May 1965 Quarterly. John C. Whitcomb, Jr. (1965, pp. 3-6) defended the six-day creation concept as he demolished the so-called proofs of a theory that allows creationists to accept the geologic timetable without question. In a companion article Arthur F. Williams (1965, pp. 7-13) explained that the Genesis account of creation must be taken literally. A major portion of the treatise discussed the Hebrew word *yom* (day); the conclusion was reached that it is a literal day. Both of these presentations were unequivocal in their defense of the scriptural account of origins.

Botany

George F. Howe (1965, pp. 14-19) discussed convergent evolution and explained that the parallelisms found in nature can better be explained by a Creator using a repeated pattern rather than a common ancestor Some topics discussed were:

Parallelisms in bacteria
Parallelisms in fungi
Parallel life cycle patterns
Parallelisms in vascular plants
Parallelisms in guard cells
Parallelism between beefwood and horsetail plants
Anatomical parallelisms

Walter E. Lammerts, founder of the Society and an internationally famous rose breeder, conducted experiments on induced variation in roses by neutron radiation (1965, pp. 39-43). Some of his conclusions in this careful study were:

> In terms of the pre-patterning theory, it would seem that mutations can only alter various phases of its expression but the *pattern itself cannot be changed.* In terms of this theory, Queen Elizabeth [a rose variety] is the expression of a definite pre-pattern. The expression of this pattern depends on the interaction of the environment and the DNA genetic code. Changes in the environment or mutations in the code can alter the expression of the Queen Elizabeth pattern but cannot basically change it.
>
> It is understood that this concept reduces the role of mutations to a relatively minor one . . . Rather we see clear evidence for creative design . . . (pp. 42, 43)

This excellent article, as well as many others found in CRSQ, exposes the blatant lie of some evolutionists that creationists do not do laboratory research or field studies.

In a brief presentation on intelligent design in plant and insect relationships, Harold W. Clark (1965, pp.3, 4) first discussed the yucca and the pronuba moth. Then several examples of pollination methods in plants were noted with the conclusion that such systems could only have been planned and created.

Adaptation and Limbs

There are two articles in this volume by E. V. Shute (1965a, pp. 22-26; 1965b, pp. 11-14) where the author rapid-fires the reader with remarkable adaptations of creatures that "fill every environmental and ecological niche in sea, on land or in the air" (1965a, p. 22). One after another, the reader is deluged with instances of organisms that have characteristics that enable them to survive in so-called hostile locations. One's credulity is stretched to believe that brute natural processes could have engineered such adaptations. These articles are "gold mines" of instances where intelligent design is the reasonable answer.

The various theories for the origin of the tetrapod limb were presented (Davis, 1965, pp. 27-31) along with the inadequacy of each concept. The difficulty of such a proposed evolutionary sequential change to achieve the end result was outlined. Creation was offered as the obvious solution.

Geology and Paleontology

Rita Rhodes Ward (1965, pp. 32-38) opened her article with these remarks

> Because of the great importance attached by evolutionists to the English *Micraster* as an example of fossil evidence of change of species, it was decided to make a study of the major research papers dealing with this genus and relate the material o creationists' concepts (p. 32).

The author then studied her own specimens [pictures of which are given on pp. 37, 38] and stated that macroevolution did not occur. The organisms may have changed slightly, but they started out and ended up as *Micrasters*- after their kind.

Historical geology was the subject of a discussion by Henry M. Morris (1965, pp. 19-28). He noted the instances of what is science and what is scientism in that discipline. The principles of thermodynamics were employed to illustrate the truly observable in science when compared with the molecules-to-man evolutionary myth. Basic inconsistencies in uniformitarianism were explored and a brief discussion of the Creation-Flood model was given.

Philosophy and History

Richard Korthals, a Fellow of the Society, offered a comparison (1965, pp. 6-14) of the two conflicting models of science, creationism and evolutionism. The philosophical base of each model was presented by Rushdoony (1965, pp. 15-18). Thomas G. Barnes, the very productive creationist physicist, developed a creation model (1966, pp. 5-8) based on the three laws of thermodynamics.

Harold Armstrong, a classical scholar and editor of the Quarterly for 10 years, believed that Aristotle was not an evolutionist by modern definition (1965, pp. 9, 10). A well-documented study on the effect of the evolutionary hypothesis, particularly Neo-Darwinism, on western civilization was published (Moore, 1966, pp. 13-23). The author concluded that the theory "has been fostered by highly spurious science" (p. 21) to *indoctrinate* the leaders of western civilization causing disastrous consequences.

Carbon-14

The use of carbon-14 in relation to the antiquity of man was presented (Wood, 1966, pp. 24-27) and Armstrong (1966, pp. 28-30) devised graphs to correct for the effects of the Flood in determining dates by radioactive carbon. The reliability of carbon-14 dating was discussed also (Anon., 1966, pp. 31, 32). Several problems with the method were noted.

Summary

As the reader can realize, many scientific, historical and philosophical topics were explored from a creationist viewpoint in this volume. The Quarterly is one of the few scientific journals devoted to this objective. It has always provided an outlet for creationist scientific opinion.

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Evolutionist: Friend or Foe?

Many contend that evolution is a system of false religious philosophy at odds with Christianity by design. The accusation has been denied by one prominent evolutionist for reasons that may be either naive or dishonest:

> I am both angry at and amused by the creationists; but mostly I am deeply sad. Sad for many reasons. Sad because so many people who respond to creationist appeals are troubled for the right reason, but venting their anger at the wrong target.
>
> I can understand that requiring that evolution be-taught in the schools might be seen as one more insult. But the culprit is not, and cannot be, evolution or any other fact of the natural world. Identify and fight your legitimate enemies by all means, but we are not among them (Gould, 1981, p. 37).

Such an impassioned plea may soothe sensibilities for those who have been labeled "theistic evolutionists." Yet, German biblical critic David F. Strauss was quoted in a rare instance of evolutionist honesty:

> Vainly did we philosophers and critical theologians over and over again decree the extermination of miracles; our ineffectual sentence died away, because we could neither dispense with miraculous agency, nor point to any natural force able to supply it where it had hitherto seemed most indispensable. Darwin has demonstrated this force, this process of Nature (sic); he has opened the door by which a happier coming race will cast out miracles, never to return. Everyone who knows what miracles imply will praise him, in consequence, as one of the greatest benefactors Of the human race (Himmelfarb, 1968, p. 388).

Whatever Darwin may have demonstrated, the "process" of evolution cannot be thus accredited. Furthermore, not everyone cognizant of miraculous implication praises Darwin for his highly questionable contribution to the social welfare. Yet, the Strauss diatribe could well rank among the statements of relative diplomacy when compared with testimony offered by Darwin's bulldog:

> Let every man . . . if he be so inclined, amuse himself with such scientific implements as authority tells him are safe and will not cut his fingers; but let him not imagine he is, or can be, both a true son of the Church and a loyal soldier of science (Huxley, 1896, p. 149).

Our active participation in the creation/evolutionism debate covers a decade. During that period we have encountered, mostly through correspondence, a number of professed Catholics, clergy as well as laity, who believe they have reconciled Catholic Faith with evolutionism. I personally believe such people have only accommodated evolution. This point has been made most emphatically by the testimony of a Brown University biology professor:

> . . . Dr. [Duane T.] Gish's suggestion that evolution and creation are mutually exclusive ideas is insulting to me personally (I am a Roman Catholic) as well as to the great majority of scientists of Christian, Jewish, Moslem, Hindu, Buddhist and other faiths who understand quite well that biological evolution is a scientifically supported fact (Miller, 1982, p. 3).

Gish may very well have offended other Christians, Jews, Moslems, Hindus and Buddhists. Darwin's most avid supporter definitively pointed up the naivete of Catholic evolutionists:

> If Suarez has rightly stated Catholic doctrine, then is evolution utter heresy. And such I believe it to be. In addition to the truth of the doctrine of evolution, indeed, one of its greatest merits in my eyes, is the fact that it occupies a position of complete and irreconcilable antagonism to that vigorous and consistent enemy of the highest intellectual, moral, and social life of mankind—the Catholic Church (Huxley, 1896, p. 147).

That viewpoint was expounded nearly a century ago. Yet, we still find apologists on each side of the issue who will try to reconcile evolutionism with some sort of quasi-Christianity. The typical evolutionist position has only a slightly more pathetic tone than that of the accommodationist: "There is nothing inherent in an evolutionary framework which denies theism. . . . The scientific method does not weed out God" (Varisco, 1982, p. 20).

Perhaps it is typical of anthropologists that they operate outside the realm of mainstream evolutionist thinking. Yet, whether such testimony is intellectually dishonest or just naive, the result is the same. The view just quoted is not shared by all evolutionists:

> There is no common middle ground between supernatural religion and science; to suggest that there is is deceptive. Science and religion are two entirely different and separate spheres of thought. The human mind, being the wonderfully complex organ that it is, is certainly capable of believing in supernatural religion and science simultaneously, and numerous respectable individuals do just that and feel that they have found common ground. (It is debatable whether they have in fact or whether they are simply holding contradictory views simultaneously.) (Schafersman, 1987, p. 6).

Nor is naivete (or dishonesty, whatever the case may be) limited to anthropologists. A physiologist at UCLA medical school was also accomplished in the art of self-deception:

> Clearly, evolution didn't suddenly pop up as a theory put forth by cynical atheists seeking to undermine the Bible. On the contrary, it evolved from a literal belief in Genesis, as devout creationists tried to grapple with disturbing new evidence. By the time Darwin died, in 1883, his views had become sufficiently palatable to orthodox Christians that his body was honored by burial in Westminster Abbey (Diamond, 1985, p. 89).

Clearly, the previous quotes have demonstrated the wrong-headedness of such claims. "Cynical atheists" may very well not have initiated the thrust of evolutionism. They may not have even been particularly influential in promoting the original concept. However, there is no question that evolution has been most enthusiastically embraced by atheists.

Still, many who would call themselves Christian accommodate to a system of thought that has the unflinching support of the most ardent enemies of Christianity. Moreover, they do so, seemingly, without the

slightest hint of suspicion. Refreshingly, there are yet some evolutionists who view honesty, if not a virtue, at least as an art form worthy of practice: "In a real sense Darwin produced a theory of proximal cause, evolution by natural selection, designed to exorcise the specter of supernatural design" (Brooks and Wiley, 1988, p. xii).

In a real sense, from the limited exposure of personal experience, we see Darwin's only accomplishment as that of exorcising ". . . the specter of supernatural design." Anyone who believes Darwin made a significant contribution to science, is encouraged to consult a good dictionary and learn how he assumed, imagined and speculated his way through the *Origin of Species.* Additionally, one will search that literature in vain for the slightest hint of explanation for the origin of any species.

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Rapid Erosion

The creationist model for canyon formation, as well as certain other features of the earth, depend upon very rapid erosion of soft and semi-hard material during and after the Flood. One example of rapid erosion in modern times was noted by Williams (1986) previously. The following quotation from Cleland (1925, p. 96) cites two other examples.

> The Duna, a river of eastern Prussia, blocked by an ice jam in 1901, was forced to take a new course. In thirty-four hours it was able to cut a gorge one meter to three and a half meters deep and four meters to eight meters wide, representing an excavation of 2250 cubic meters of material. The bottom of the Sill tunnel in Austria was provided with a pavement of granite slabs more than a yard thick. Great quantities of debris were swept over this pavement at a high velocity, and so rapid was the abrasion that it was found necessary to renew the granite slabs after a single year.

Even hard materials such as granite can be worn rapidly by moving water containing abrasive solids. Possibly cavitation (Holroyd, 1990, a, b) was responsible for some of the damage in the Sill tunnel?

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MINUTES OF 1990 CREATION RESEARCH SOCIETY BOARD OF DIRECTORS MEETING

On Thursday, 19 April 1990, a meeting of the Executive Committee was held at the Wolverine Best Western Motel, Ann Arbor, Michigan, from 2000 to 2200 hours to plan agendas for the committee meetings on Friday. On Friday, 20 April 1990, between the hours of 0800 and 1700, the Constitution/Bylaws, Financial, Publications, Quarterly Editorial, Research and Temporary Meeting Committees each met for approximately two hours. The Chairmen of the Committees recorded the business in preparation for the Saturday business meeting.

The official annual meeting of the Society was opened at 1900 hours by President Frair in Room 102 of the Science Building at Concordia College, Ann Arbor, Michigan. Present: D. Boylan, E. Chaffin, D. DeYoung, W. Frair, D. Gish, G. Howe, D. Kaufmann, J. Klotz, J. Meyer, D. Rodabaugh, W. Rusch, E. Williams, G. Wolfrom. Absent by prior arrangement: P. Zimmerman. Also present were 105 visitors. The President welcomed everyone to this meeting of the 27th year of the Creation Research Society. This was followed by silent prayer.

Dr. David Schmiel, President of Concordia College, welcomed CRS members and guests to the College. President Frair expressed gratitude of the CRS to Mr. David Golisch, President of the Southeastern Michigan Creation Science Association, for providing refreshments. Mr. Golisch spoke briefly expressing his appreciation for the work of the CRS.

Meyer reported that the Research Committee was sponsoring the following studies: computer simulated models of cavitation of water on soil, rapid erosion of canyons, geological overthrusts of strata in Virginia and chromosomal variations in mammals. Frair gave a report of creation in the news, including the ICR accreditation case in the federal courts and of the latest books published on creation science.

Rodabaugh introduced the speakers of the mini-symposium. Klotz spoke on the agreement of creation theology and the proper use of the environment. Chaffin gave a presentation on the speed of light. DeYoung gave a report on black holes in space. Rusch read Zimmerman's paper on the threat of theistic evolution to Biblical creationism. Howe gave a mini-lecture on wax-producing desert plants. Kaufmann gave a presentation on functional proteins—witness to creation. Gish gave a slide presentation on the place of dinosaurs in creation history. The meeting was adjourned at 2130 for refreshments.

On Saturday, 21 April 1990, the closed business meeting of the Board was called to order at 0820 hours. Present: D. Boylan, E. Chaffin, D. DeYoung, W. Frair, D. Gish, G. Howe, D. Kaufmann, J. Klotz, J. Meyer, D. Rodabaugh, W. Rusch, E. Williams, G. Wolfrom. Absent by prior arrangement: P. Zimmerman.

The minutes of the 1989 meeting were read and adopted. Secretary Kaufmann reported the following were elected to the Board for a three-year term: Frair, Howe and Meyer. The Treasurer's report by Meyer was given as follows. The total income for 1989 (9 months) was $66,785. The total expenses for 1989 were $41,051. The total net assets (life member endowment, laboratory endowment, Quarterly endowment, book fund, research fund, and general fund) of the Society were $312,597. The auditor's report was accepted by the Board. The membership report by Wolfrom was given as follows. Total membership was 1790 up 26 from 1989. The membership breakdown is: Voting 635 (36%), Sustaining 741 (41%), Subscriber 368 (21%) and Student 46 (2%).

The Editor's report by DeYoung was given as follows. Thirty-one manuscripts were received; 16 were published and 15 were rejected. Nine book reviews, 15 panorama items and 21 letters were published. The report of the Constitution/Bylaws Committee by Boylan was given as follows. Written job descriptions for the seven officers were discussed and approved. A document outlining the structure and responsibilities of the standing committees: Research, Quarterly Editorial, Publications, Constitution/Bylaws and Financial committees was discussed and approved. It was passed that the Editor be removed as an Officer as given in Article I, Section 1 of the bylaws.

The report of the Financial Committee by Meyer was given as follows. It was recommended and passed that Meyer be permitted to hold both the office of Treasurer and Financial Secretary for the 1990-91 year. It was recommended and passed that the bonding of officers be postponed until the 1991 Board meeting. The Quarterly Editorial Committee recommended no new action.

The report of the Publications Committee by Wolfrom was given as follows. The Quarterly Five-Year Index is delayed. The *Vestigial Organs* and *Origins—What Is At Stake* books are ready for printing. The *Darwin, Evolution and Creation* and *Rock Strata and the Bible Record* manuscripts will be reviewed and revised by Klotz and Rusch. Committee members will check the status of our repository collections at the Masters College, Christian Heritage College, Bob Jones University, Concordia College and The King's College. It was passed that any non-CRS published book to be distributed by CRS first should be reviewed in the Quarterly and reviewed and recommended by the Publications Committee. It was passed that Frair and Howe approach Zondervan and resolve the situation over our high school textbook. It was passed that the proceeds from our sale of publications should go into the book fund.

The report of the Research Committee by Meyer was given as follows. The Committee is considering conducting a project involving the Grand Canyon which will include an analysis of the materials in the Research Library of Grand Canyon National Park. It was moved and passed that all future candidates for the CRS Board must have published at least one scholarly research paper in the *CRSQ*. This motion supersedes previous publication requirements for Board nominees.

Lane Lester was nominated for the CRS Board to be voted on in 1991. It was passed that the following be renominated for the CRS Board in 1991: E. Chaffin, J. Klotz, D. Rodabaugh and G. Wolfrom. It was passed that the next Board meeting be on 11-13 April 1991 at Ann Arbor, Michigan. It was decided that the topic for next year's Friday evening program be "Current Developments in Creation Science."

It was passed that Frair be nominated for President, Wolfrom for Membership Secretary, Kaufmann for Secretary, and Meyer for both Treasurer and Financial Secretary. This slate of officers was elected. Frair shared a revised version of a CRS brochure that soon should be available for distribution by Board members.

E. Williams and P. Zimmerman were nominated for elevation to the status of Fellows of the Society. Both were unanimously elected. This makes a total of 15 members of the CRS elected to Fellow status. It was passed that we initiate a "Patron" category of membership involving a one-time contribution of $2500 or $500 per year for five years. Such patrons would receive a plaque and their names will be published annually in the *CRSQ*.

A request from a sustaining member that the Board allow people with Master's Degrees in theology to become voting members of CRS was discussed. It was decided that the Board not change its policy regarding the degree requirements for voting membership. It was passed that the CRS send a $100 contribution to the Concordia Historical Institute at St. Louis. Klotz volunteered to determine whether or not Concordia Historical Institute is abiding by our desire to limit access to the CRS archives only to those who have Board approval.

It was passed that if the plans and zoning are approved for the building in Arizona, the fund raising effort this year should be directed toward construction of this building. But if the plans are not approved by September, the fund raising should center on the Laboratory Fund. It was passed that the name of the Laboratory Fund be changed to the Research Endowment Fund. It was passed that Howe be authorized to rent a storage facility for CRS equipment, books and other items. It was passed that the CRS employment services be relocated and administered by Frair for one year. Since the postal rates are increasing, it was passed that CRS add a postage and handling fee to each book order. It was passed that dues for every category of membership (except life membership) be raised one dollar for the 1991-92 subscription year. It was passed to send a list of the names and addresses of people who attended our Friday evening meeting of 20 April to D. Golisch of the Southeastern Michigan Creation Science Association. The meeting was adjourned at 1635.

David A. Kaufmann
Secretary

MINISYMPOSIUM ON VARIABLE CONSTANTS—IX*

THE IMPERATIVE OF NON-STATIONARY NATURAL LAW IN RELATION TO NOAH'S FLOOD

JOHN R. BAUMGARDNER**

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Abstract

Massive tectonic changes must have been associated with Noah's Flood if the Flood and its after effects are correlated with the record of fossils in the earth's sedimentary rocks. The required tectonic changes include the sinking of all the pre-Flood ocean lithosphere into the mantle, the formation and cooling of all the present-day ocean lithosphere, and displacements of the continents by thousands of kilometers. Such large-scale tectonic change cannot be accommodated within the Biblical time scale if the physical laws describing these processes have been time-invariant.

Introduction

Straightforward reading of the Bible allows no place for large-scale destruction of life on earth prior to the Flood of Noah. The general absence of multicellular fossils in Precambrian rocks and the abrupt initial appearance at the Precambrian-Cambrian boundary of a wide diversity of complex multicelled lifeforms, frequently in high concentrations, seems therefore logically to imply that the onset of the Flood catastrophe must correlate with this striking discontinuity in the geological record. The Precambrian-Cambrian boundary not only marks the sharply defined beginning to the abundant global occurrence of fossils, it generally also represents a catastrophic, physical unconformity in the rocks themselves.

The genealogies recorded in Genesis 10 and 11 link the Flood with the remainder of Biblical history and require the Flood to be no more than a few thousands of years ago. If the earliest Cambrian rocks do indeed represent the initial stage of the Flood catastrophe, then a staggering amount of geological change must be associated with the Flood itself, and the upper portion of the geological record must describe a period of post-Flood adjustment as the earth recovered from this planet-wrecking upheaval. Abundant observational evidence attests to catastrophic conditions associated with most of the geological record, from the Cambrian to recent. Strong evidence that most of the earth's major coal deposits are of catastrophic, allochthonous origin (Austin, 1979) in itself testifies to the pervasiveness of global catastrophe throughout the record.

A major problem arises, however, as one attempts to apply the principles of physics, as we now observe them, to understand how a catastrophe of this magnitude could unfold in such a brief span of time so recently in the earth's past. The remainder of this note will attempt to highlight some examples of this problem to argue that the most likely explanation is that the physical laws were somehow altered by God to cause the catastrophe to unfold within the time frame of the Biblical record.

Plate Tectonics and the Flood

Evidence for large-scale tectonic change is tightly correlated in a temporal sense with the fossil record. The most direct correlations are obtained from deep sea drilling (Maxwell *et al.,* 1970) which reveals the kinds of fossils that lie directly on top of igneous ocean floor. Another means of correlation is by comparison of magnetic reversal data—data for the pattern of magnetic reversals in ocean sediment cores versus depth (Tauxe, Butler and Herguera, 1987), data for the spatial pattern magnetic stripes that are imprinted in the igneous rocks of the ocean floor, and data for the pattern of magnetic reversals in successive lava flows on the flanks of volcanoes in continental environments. The evidence argues compellingly that during the time that thick fossil-bearing sediment sequences were deposited on the continents, major plate tectonic activity was also taking place, involving the sinking of huge areas of oceanic lithosphere into the mantle at deep ocean trenches and the formation of new ocean floor from molten upwelling magma at mid-ocean ridges. Indeed not one square kilometer of ocean floor older than Mesozoic has been identified on the face of the entire earth (Sclater, Jaupart and Galson, 1980).

This latter fact implies that the Flood catastrophe involved not only the earth's surface in generating thick layers of sediment, but the earth's interior as well, with significant movement of material within the earth's silicate mantle (Baumgardner, 1986). It seems to require that all the pre-Flood ocean lithosphere—likely representing some 65 percent of the earth's surface area—be absorbed into the earth's interior and be replaced with new lithosphere formed from molten material at a mid-ocean ridge. It requires relative motions of continental blocks of thousands of kilometers. The entire Atlantic Ocean opens during this time span as North America migrates away from Europe and South America moves away from Africa. Similarly, the Indian Ocean comes into existence as what had been a stable continental block usually referred to as Gondwanaland breaks apart to produce the fragments India, Australia, and Antartica that move away from the piece now known as Africa (Smith, Hurley and Briden, 1981).

The evidence is so overwhelming the logic seems unassailable that massive tectonic changes have un-

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folded since abundant fossils began to appear in the sedimentary record. It is therefore the author's strong conviction that any attempt to reconstruct the physical events associated with the Biblical Flood must recognize and account for the plate tectonics aspects of geological history.

Two Severe Challenges

Two of the major challenges in accounting for large-scale tectonic change in a time frame of only a few thousand years concern the deformation rate of mantle rock and the cooling rate of lithospheric plates. Let us first consider the issue of mantle rheology. There are good reasons to suspect that a sizable fraction of the pre-Flood ocean lithosphere sank during the year of the Flood itself (Baumgardner, 1986). If, on the average 2500 km of ocean floor migrated toward a trench and sank during the Flood year, the mean plate velocity was about 2.5×10^6 cm/yr (or about 3 m/hr). This is about a million times higher than the mean present-day plate velocity. Since both today and almost certainly during the Flood also, the primary driving mechanism (Oxburgh and Turcotte, 1978) for producing motions in the mantle is buoyancy forces (such as those associated with cold sinking lithospheric slabs), the change that allowed much higher velocities during the Flood almost has to be associated with the mantle's intrinsic rheology. Expressed in a slightly different way, the basic forces responsible for moving the plates and producing circulation within the mantle, both during the Flood and now, almost certainly must be the same, namely, buoyancy forces. The forces then were probably similar in magnitude to those now, since the temperature differences responsible for the buoyancy were likely of comparable magnitude—at most only a factor of a few different. This suggests that the essential physical phenomenon responsible for the million times higher velocities has to do with the deformational properties of the mantle rock itself.

Even though the silicate material comprising the mantle is in the solid state, it deforms plastically and flows when under stress through the migration of minute defects or dislocations. Surprisingly, too, a good approximation is possible to treat mantle rock as a linear or Newtonian fluid and to quantify its creep behavior in terms of a shear viscosity. Because the migration of dislocations in a solid is a thermally activated phenomenon, this viscosity depends exponentially on the local temperature (Kirby, 1983). It depends on pressure and the state of stress as well. The strong temperature dependence suggests one conceivable way to have the mantle deform more readily—namely to make its temperature closer to its melting temperature. As a rough rule of thumb, a 100 K change in this difference changes the viscosity by a factor of 10. If one wants to postulate a mantle several hundred degrees warmer during the Flood than at present, however, he is faced with the problem of how to cool the volume of the mantle by that much in the brief period of time since the Flood.

This leads us to a second major challenge in accounting for the data of plate tectonics in the context of the Flood, that of explaining how new lithosphere can migrate away from a spreading ridge and attain an effective elastic thickness of up to 50 km within the Biblical time frame. Based on experimentally measured values for the thermal diffusivity of mantle rocks, the amount of conductive cooling a lithospheric slab tens of kilometers thick experiences during a few thousand years is negligible.

As a quantitative illustration of this situation, consider the idealized problem of a solid that extends to infinity in the x direction, has a uniform temperature T_0 at time t = 0, and is bounded by a plane at x = 0 whose temperature for positive times is fixed at zero. This cooling problem has the analytic solution for the temperature T inside the solid as a function of time and position given by $T = T_0 \operatorname{erf}[x/(4\kappa t)^{1/2}]$ (Turcotte and Schubert, 1982), where erf represents the error function and κ is the thermal diffusivity. The temperature reaches a value of $0.5T_0$ when $t = 1.10\ x^2/\kappa$. If one uses this idealization as a model for the cooling of ocean lithosphere with a value for $\kappa = 1.2 \times 10^{-6}\ m^2/s$ (Stacey, 1977) representative of igneous rock, one finds that rock at a depth of 50 km requires 73 million years to cool by an amount equal to half the temperature difference between the deeper mantle and the ocean water. To be even more specific, suppose the initial temperature difference is 1000 K. After 5000 years, the temperature drop at 0.5 km is 408 K, at 1 km is 104 K, and at 2 km is 1 K. The cooling at depths greater than 2 km can be ignored entirely.

Although hydrothermal circulation of ocean water does play an important role in cooling the upper few kilometers of ocean floor near a spreading ridge (Sempere and MacDonald, 1987), this mechanism does not appear to be important once a modest blanket of sediment is present on the ocean bottom. Therefore, it seems essential to invoke some additional mechanism to account for the cooling of the present oceanic lithosphere to its current thickness in just a few thousand years. It can be added that these same comments also apply to the cooling of large magmatic bodies in continental environments known as batholiths.

Discussion

These two challenges—how to account for deformation rates in the mantle on the order of 10^6 times those presently observed and cooling rates in large rock bodies at least 10^4 times those implied by easily measured rock thermal diffusivities—involve principles of physics believed to be so well understood, that the author is convinced that the resolution of the challenges logically demands abandoning the usual assumption of time invariance of natural law. (In this brief note I have avoided discussing nuclear decay rates, but I am convinced that these rates must also have been many orders of magnitude higher during the Flood catastrophe.) The observation that many diverse physical phenomena seem to require many orders of magnitude revision in their fundamental controlling parameters suggests that by studying the systematic of the directions the various fundamental parameters need adjustment, clues possibly can be found that identify a single adjustment underlying all the others. Of course, such an investigation is allowable from a philosophical standpoint within a theistic worldview which holds the cosmos itself is an open system. It is, however, essentially excluded from a naturalistic framework which assumes the cosmos is all there is and, as such, is closed.

It is the author's suspicion that God modified some single fundamental aspect of the natural order which in turn affected all the fundamental forces—including the gravitational force, the electrostatic force, and the nuclear forces—in a manner that did not fatally disrupt the delicate balances that exist in living systems and whose signature in the astronomical data may be subtle. The author believes that the sooner the community of scientists who are aware of the integrity of the Bible is convinced the system of natural law that normally describes the orderly behavior of the cosmos cannot have been time-invariant, the sooner genuine progress will be made in establishing the framework that accounts for Noah's Flood and the geological history of our planet in a robust and satisfying way.

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MINISYMPOSIUM ON VARIABLE CONSTANTS—X

RADIOHALO EVIDENCE REGARDING CHANGE IN NATURAL PROCESS RATES

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Abstract

Radio halos provide a direct comparison of the results of identical physical processes that occurred over a period encompassing a large fraction of Earth's history. Accordingly they can demonstrate changes in natural process rates, i.e., in basic physical law, that occur too slowly to be demonstrated by observations made during the epoch of modern science, or that occurred episodically before the development of modern investigative capability.

The identifiability of radiohalo rings with the alpha-particle sources that produced them, together with the sharpness of these rings indicate that radioisotope half-lives over a range of 21 orders of magnitude have not varied by more than a factor of two during the time the geological formations of the Earth which contain radio halos have been in existence, and probably over the entire time represented by geological formations. A plausible further deduction from this evidence is that there has been no significant variation in the nuclear long-range force, the nuclear short-range force, or the electrical interaction force during this time interval.

Introduction

Since the beginning of modern scientific insights there has been intense curiosity over whether the basic physical processes (interactions) of the natural world are universal in both space and time, or have been characterized by evolutionary change. Biblical creationists are particularly interested in this topic because of difficulties that have developed with respect to some chronological conclusions which have been drawn from specifications in the Bible.

The basic physical interactions of the natural world appear to be so complexly interacting and so finely balanced as to exclude large change in the associated "laws." Such evidence supports the theist viewpoint that the Creator has optimally designed and optimally maintains the physical universe. Speculation concerning either constancy or variability of fundamental natural process rates, i.e., basic physical laws, over the history of the physical universe calls for data which clearly favors one possibility against the other.

Within the short time span of modern scientific measurements there has been no firm indication of change in basic physical relationships (laws). Within the constraints of soundly interpreted experimental data, one must conclude that whatever changes in basic physical processes (laws) may have occurred, either take place too slowly to be apparent over the time span of modern observational capability, or have occurred episodically before the era of modern science.

Radiohalos provide a direct physical means for comparison of results of identical processes which have operated over most of the history of the present geologic features of Earth's crust. Consequently they may be expected to provide straightforward evidence concerning the constancy of basic relationships (laws) in the natural world.

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^{238}U Radiohalo Characteristics

Microphotograph of ^{238}U radiohalo sets have been published by Robert Gentry (1974, 1987). The natural formation of a ^{238}U radiohalo ring set requires a minute concentration of mineral foreign to the lattice in which the rings are formed. The radioactive (radium-like) transition of ^{238}U in this foreign mineral to stable ^{206}Pb releases a series of eight alpha particles which disrupt the crystal lattice structure in the surrounding area to form the concentric spherical damage patterns which are exhibited as rings in cross-section. Figure 1 gives an idealized scale model in half cross-section.

Although the alpha particles associated with a set of radiohalo rings are produced in sequence, as indicated in Table I, the rings develop simultaneously. After the radioisotope decay has reached equilibrium in which each stage has the same number of disintegrations per unit time as every other stage, all rings (shells) develop at the same rate. (This feature does not apply to isolated polonium radiohalo sets which may begin with a relatively short half-lived parent and proceed to a longer-lived daughter.)

The density of each ring is inversely proportional to the square of its radius (shell surface area). Consequently, in a reproduction of a photograph the inner rings may be indistinguishable due to overexposure, or the outer ring may be indiscernible due to underexposure. Rings (shells) are produced because the capability of an alpha particle for producing crystal lattice dislocation increases as the alpha particle is slowed, producing a sharp maximum damage at the end of its path. The density of radiohalos is a nonlinear function of the number of alpha particles per unit area, and does not provide a useful means for estimating exposure e. For a more detailed discussion see Michael R. Owen, 1988. Dr. Owen's paper is *essential* reading for anyone who wishes to understand radiohalos.

Another factor complicating the interpretation of uranium radiohalo ring density is the demonstrated independence of polonium radiohalo ring sets and complete uranium radiohalo ring sets, commonly associated with each other (Gentry, 1987). Since Po can be separated from U in natural processes and independently deposited at foreign mineral centers in a crystal lattice, both Po and U could be deposited at the same center, the Po either simultaneously or subsequently, resulting in the three Po rings being darker than they would be if only U had been deposited. I am not aware of any investigation of relative ring densities for the purpose of determining Po/U ratios in centers for U halo sets, but valuable information would be obtained from such investigation.

Table I. Uranium-238 radiohalo set data. Sequence number one is first for the emission series, and largest for the radiohalo set sequence. Range values were derived from range-in-air measurements, as explained in the text.

Emission Sequence	Radiohalo Set Sequence	Parent Atom	Half-Life	Daughter Alpha Energy (Mev)	Range in Biotite (microns)
1	8	^{238}U	4.51 x 10^{9} yr	4.20	12.9
2	6	^{234}U	2.48 x 10^{5} yr	4.77	15.6
3	7	^{230}Th	7.52 x 10^{4} yr	4.68	15.1
4	5	^{226}Ra	1600 yr	4.78	16.0
5	3	^{222}Rn	3.823 d	5.48	19.7
6	2	^{218}Po	3.05 min	6.00	22.6
7	1	^{214}Po	1.64 x 10^{-4} s	7.68	33.6
8	4	^{210}Po	138 d	5.30	18.7
---	---	^{206}Pb	(stable)	----	----

The half-life associated with each radiohalo is determined by the short-range and long-range attractive forces within the atomic nucleus, and by the Coulomb (electrical) repulsive force between protons in the nucleus. Large changes in half-life may be expected from relatively small changes in these nucleon interaction forces (Siemens and Jensen, 1987, chapters 2 and 10; Preston and Bhaduri, 1975, chapters 2, 5 and 11).

The penetration range of alpha particles can be measured with high precision in air. Since the stopping power of a medium for alpha particles is determined by Coulomb (electrical) interactions, the higher electron and proton density in a solid with respect to air produces a greatly reduced alpha particle range (halo radius). A theoretical calculation predicts alpha particle ranges in mica which are within ± 4% of those observed (Owen, 1988). The range values given in Table I were obtained in this way, using 0.94 ± 0.02 for the conversion from range in quartz to range in biotite (Owen, 1988, Table I). Direct measurement of radiohalo radii in biotite yields values within 0.3% to 4% of the theoretical values given here in Table I, Due to variations in the chemical composition of biotite, and to varying alpha particle energy loss within the varied sizes of foreign mineral centers from which the alpha particles originate, such close agreement is remarkable.

Radioisotope Half-Life Variation Limits

A linear regression for the value of half-life (T) in years and range (R) in microns from Table I yields

$$\ln R = 2.940 - 0.01911 \ln T \qquad (1)$$

with a 0.987 coefficient of determination. (A 1.000 coefficient of determination would specify a perfect fit of the data to a linear relationship.) Taking implicit differentiation and rearranging terms we obtain

$$(dT/T) = -52.3\ (dR/R) \qquad (2)$$

These equations are valid over the 21 orders of magnitude range of T from 5.20 x 10^{-12} year for ^{214}Po to 4.51 x 10^{9} years for ^{238}U.

Radiohalo radii are identifiable and may be determined within ± 4% (Owen, 1988, Table I, column 6; see also discussion of column 4). An error analysis of T with respect to R, using equation (2), reveals a maximum half-life variation of ± 2 for a ± 4% variation in range. From these results we may conclude that over the 21 orders of magnitude covered by the data for the radioactive half-lives of uranium and its daughter products, nuclear half-lives have not varied more than a factor of two over the time the geological formations which contain radiohalos have been in existence, and probably over the time represented by all geological formations on planet Earth.

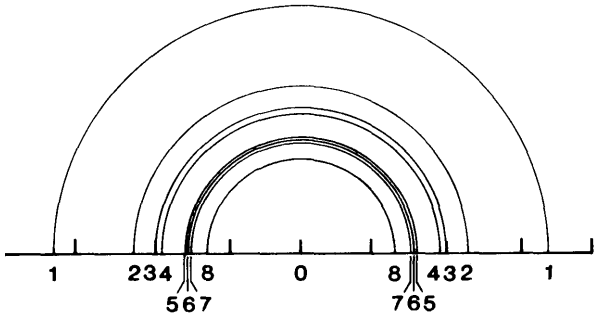

Figure 1. Simplified schematic half-circle representation of Uranium-238 radiohalo set. See Table I for explanatory data. Distance marks designate 10 micron intervals. Numbers designate set sequence.

Conclusion

A linear regression for the values of alpha-particle energy (E) in Mev and half-life (T) in years from Table I yields

$$\ln E = 1.678 - 0.01198 \ln T \quad (3)$$

with a 0.985 coefficient of determination.

The energy of the emitted alpha particle, as well as the probability (half life) for the emission process, is determined by the relationship between long-range and short-range attractive forces between nucleons and the Coulomb (electrical) repulsive force between the nucleons which are protons. The stopping distance (range) for alpha particles emitted from atomic nuclei is determined by the magnitude of the electrical interaction between these alpha particles and the protons (repulsion) and electrons (equal attraction) in the surrounding medium. This magnitude is determined by the intensity of interaction with adjacent individual protons and electrons, and by the electric field which represents the combined influence of the more distant proton and electron distribution patterns in the medium. In solids the proton and electron distribution pattern is determined by electrical binding forces.

Electrical interaction is involved in both the emission and the stopping of alpha particles. Nuclear long-range and short-range attractive forces are involved only in their emission. Compensatory changes in these three forces can be postulated that result in a large change in the half-life but no change in the alpha particle penetration distance associated with one radioisotope. For reasoning confined strictly to the physical evidence at hand it seems highly unlikely that changes in the basic natural laws for these three forces (interactions) could be compensatory for large changes over the complete range of half-life and alpha energy of all the alpha particles produced by spontaneous nuclear transmutation. The most straightforward conclusion is that radioisotope half lives and the basic laws (patterns and magnitudes) of physical behavior have not changed over the time geological formations have been in existence, and probably have not changed throughout the history of the universe.

Such conclusions do not apply to circumstances such as a creation or a miracle in which God's activity is manifest differently than in the ongoing manifestation given by the regular operation of the universe. One can propose, or attempt to conceive, circumstances in which nuclear decay rates were altered dramatically while the penetration range of decay products remained unchanged. But sound creation science requires recognition that within the limitations of the currently available data such circumstances have support only from an interpretation of religious source material. Sound creation science seeks harmony between the revelation of God in the ongoing phenomena available for critical investigation (such as radiohalos) and the revelation of God in the Bible (particularly the accounts of Creation Week, the Noachian Flood, the miracles of the Exodus, and the miracles of Christ). While a presentation such as this may propagandize a personal view concerning what is truth, according to my perspective its primary function is to assist the reader in achieving what for him is the most fruitful harmonization of God's works and God's Word. I share the analysis in this paper in trust that it will increase appreciation for both God's works and His Word.

Acknowledgments

It is a privilege for me to acknowledge the technical and literary contributions made by Benjamin Clausen, Clyde Webster, and unnamed reviewers in the development of this presentation.

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QUOTE

Duhem is usually classed among the late nineteenth-century "Positivists," who are not to be confused either with the positivistic movement founded by Comte or the later (and still influential) school of "Logical Positivists," founded in Vienna and characterized by such men as Schlick and Carnap. Instead, Duhem is classed with men who like himself were practicing physicists, namely Ostwald and Mach, who also came to the conclusion that physical theories were not to be seen as descriptions of reality, but rather as "short-hand" notations used by physicists to classify or to summarize experimental evidence. These men were more aware of the history of physics than their colleagues, and thus aware of the many different ways that scientific evidence and empirical laws could be explained by different theories.

Caiazza, John C. 1988. Book review of Uneasy Genius: The Life and Work of Pierre Duhem. *Modern Age* 32:155.

MINISYMPOSIUM ON VARIABLE CONSTANTS—XI

CRITIQUE OF "RADIOHALO EVIDENCE REGARDING CHANGE IN NATURAL PROCESS RATES"

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Abstract

The conclusion of the previous article (Brown, 1990) that the sharpness of halo rings established the constancy of radioactive decay rates is examined and rejected. The conclusion is found to rest on uniformitarian assumptions, the validity of quantum mechanics at all past times, and on the view of the relation between "miracles" and scientific considerations. Lastly, some comments are made on some faulty claims relative to the proximity of Po and U halos and on the implications of the darkness of halo rings and/or densitometer studies.

Constant Decay Rates?

This paper (Brown, 1990) concludes that the sharpness of halo rings essentially establishes the constancy of radioactive decay rates within a factor of two over geologic time. Near the end the article goes even further and says that the "most reasonable conclusion" of theoretical analyses is that "radioisotope half lives and basic laws" have not changed "over the time geological formations have been in existence, and probably not changed throughout the history of the universe." The author does not discuss—and in fact may not be aware of—the far-reaching implications of this purely uniformitarian conclusion, but this is precisely the information needed in order for most creationists to understand the issues involved in this article.

For example, if decay rates have remained constant, then creationists need to know it, for such a view firmly establishes the basis of conventional radiometric dating for fossils as well as rocks. It appears that many creationists have thought all old radiometric ages associated with fossils can be explained away by contamination from prior radioactive decay. It is true that dating methods based on K/Ar, Rb/Sr, or U/Pb techniques are susceptible to contamination, but evolutionists have recognized this possibility and have in certain instances complimented those methods with another technique—fission-track analysis—that is not susceptible to contamination.

Fission Tracks

Fission tracks form in minerals from the spontaneous fission of U-238, and their abundance relative to U-238 is interpreted as the radiometric age of the mineral based on a constant decay rate. One interesting feature about fission tracks in minerals is that they can be completely erased by thermal annealing. Afterward, a new set of tracks develops which, on the assumption of a constant decay rate, then "dates" the time of annealing. Has such an analysis been done on annealed minerals associated with bones? Yes! Gleadow (1980) carefully analyzed thermally annealed zircons contained in a volcanic tuff overlying hominid remains in Africa. His result was a fission-track age of 1.87 million years, which closely correlates with the K/Ar analysis of 1.89 million years on other material from the same layer (McDougall, Maier, Sutherland-Hawkes, and Gleadow, 1980).

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In arriving at conclusions about the constancy of past decay rates, the paper essentially utilizes the same argument used by geologists at the turn of the century. Two empirical equations relating halo radii and alpha energies of the U-238 decay chain with the respective half-lives are emphasized. One differentiates the first equation (1) and presumably arrives at a new equation (2) relating fractional differential changes in halo radii. Using Equation 2 it is concluded that significant changes in decay rates (or half-lives) have not occurred because halo radii have remained unchanged. Using Equation 3 the paper draws similar conclusions about the constancy of alpha energies—and hence physical laws in general.

What the paper does not say is that the results of this analysis depend completely on the past validity of quantum mechanics and, in particular, the assumption that the standard quantum mechanical interpretation of radioactive decay is correct. But the past validity of quantum mechanics is hinged on the implicit use of the Uniformitarian Principle, the assumption that physical laws have remained unchanged. In other words, the author has used uniformitarian premises to conclude uniformity of radioactive decay. This is one reason why the uranium radiohalo test for decay rate stability is based on circular reasoning (Gentry, 1984).

Faith in Uniformity

A strong faith in uniformity of physical laws comes out most clearly in the discussion near the end of his article where electrical, short-range and long-range nuclear forces are assumed to have always been the same as they are today. This section says it is:

> highly unlikely that changes in the basic natural laws for these three forces (interactions) could be compensatory for large changes over the complete range of half life and alpha energy of all the alpha particles produced by spontaneous nuclear transmutation (Brown, 1990, p. 102).

Again, what the author considers to be "highly unlikely" is a conclusion based on the uniformitarian premises used in his own analysis.

Also, the idea that any proposal that such a change in decay rate has occurred is contrary to the available physical data, consequently specifies a miracle, and is a religious proposition that is outside the range of

scientific consideration, deserves special comment. Apparently the author has overlooked the fact that modern cosmology's view of origins begins with an event—the Big Bang—that has been openly acknowledged as "miraculous" by a prominent astronomer (Davies, 1982, p. 161), and yet has continued to be the subject of intense scientific investigation for several decades. And there is no question that at least some of that "scientific" interest has been fueled by a religious connection initiated by Lemaitre's anti-scriptural invention of a presumed Primordial Atom which supposedly started the evolution of the universe. Clearly, a religious attachment per se does not rule out scientific inquiry.

I suggest a broader view of this topic reveals that the miracles outlined in scripture, rather than being excluded from scientific investigation, actually may have resulted in such unusual physical effects that they can be ignored only by deliberate intent. Specifically, we have positive indication from Psalm 19 that God intended for his miraculous creative power exhibited in the heavens to point men to Him rather than to gods of wood and stone. Some men may ignore this evidence, but that does not alter God's purpose in their creation.

Should it not be expected, therefore, that the occurrence of miracles in the earth's creation would stand out boldly as contradictions within the uniformitarian framework of earth history? Such contradictions should be scientifically explored to the fullest, for in so doing they may add their weight to the testimony of scripture concerning God's creative activity. Indeed, the creation of the earth was a miracle, and scientific investigation shows there is solid scientific evidence to support it (Gentry 1974, 1984, 1988). The Flood was a miracle, and there is considerable scientific evidence to support this as well.

Likewise, in considering the age of the earth, we should realize that radioactive decay does not have to be interpreted as Brown has done in his article. In a separate publication I discuss another model of radioactive decay which completely invalidates the use of uranium-ring sizes as a measure of decay-rate change (Gentry, 1990). The fact that large decay rate changes could have occurred in this model without being reflected in enhanced ring sizes means that we must search elsewhere to find evidence of those changes. Such investigations have already been done, and scientific data strongly supportive of a young age of the earth, which is also at variance with the assumption of constant decay rates, have been published in the open scientific literature for many years. (Gentry, et al., 1982a, 1982b). All these evidences are discussed at length in a book, *Creation's Tiny Mystery* (Gentry, 1988).

Halos

Lastly, a few comments need to be made concerning the author's claims relative to Po halos and U halos. First, the claim of common association of Po halos and "complete uranium radiohalo ring sets" is not supported by the data in his reference of my article (Gentry, 1987). Neither is it supported by any of my other publications on this topic. Then how can this claim be understood? Apparently the author has taken one photograph shown in my article (Gentry, 1987), where I showed a U halo adjacent to a Po halo, and used that one photograph as the basis for claiming U halos and Po halos are "commonly associated with one another." It is not clear why or how the author managed to overlook the many instances in my publications (Gentry, 1968, 1971, 1974, 1984, 1987; Gentry et al., 1974) and in my book (Gentry, 1988) where Po halos and U halos in minerals are shown to be separate and unassociated with each other.

The second item concerns the author's view that some U halo rings might be darker than expected because Po can be separated from U and then deposited along with U in the halo center. In this case we must carefully separate fact from unsupported speculation. All the radioelements in the U decay chain—Pa, Th, Ra, Rn, Po, Bi, and Pb—can be separated from one another because they have different chemical properties. This is an experimental fact that has been confirmed numerous times. Indeed, in my studies on halos in coalified wood I found overwhelming evidence that Po derived from U decay was a part of the U-rich solution that invaded the gel-like wood at an earlier period of earth history and, moreover, was accumulated in PbSe sites within this matrix (Gentry, et al., 1974). Uranium, however, was not detected in these sites. Thus, even under ideal natural circumstances—meaning a large supply of U and its daughters—the experimental evidence shows that U does not accumulate in sites that retain secondary Po. Neither is there any evidence that Po would accumulate into typical U-halo centers such as zircons and uraninites.

This last fact relates directly to Brown's conclusion that he is not aware of any "thorough investigation" of ring densities which would determine Po/U ratios in U halos. Two matters are relevant here: (i) Obviously, if there is no evidence for Po accumulation in U-halo centers, we can hardly expect that an analysis of ring densities would reveal an accumulation that never occurred, which accords with the results of my investigation of U-halo ring densities that was published 16 years ago (Gentry, 1974); (ii) these results have not been challenged during the intervening period either by Brown or anyone else.

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ARTICLE REVIEW

Creationism and the Dinosaur Boom by W. L. Stokes. 1989. *Journal of Geological Education* 37:24-26.

Reviewed by Paul A. Garner*

Stokes' article sets out to criticize and refute the creationist model of earth history as it relates to the dinosaurian reptiles. Paul S. Taylor's book, *The Great Dinosaur Mystery (1987),* written for children, is particularly singled out for attention—Stokes calls its contents "a contrived fairy tale" (p. 26). However, Stokes' commentary consists of many misrepresentations and some easily-avoidable errors.

Stokes criticizes Taylor for using phrases like "long ago" and "thousands of years" without specifying the creationist belief in an earth age of 6000 years. Firstly, most creationists believe that the earth was created sometime between 6000 and 10,000 years ago. This notwithstanding, Stokes' criticism is insubstantial: evolutionist literature on dinosaurs for children commonly talk of "millions of years" without specifying a uniformitarian earth age of 4600 million years (e.g. Wise, 1963).

Taylor is criticized for noting the case of the wrong-headed dinosaur—the Brontosaurus (now a technically defunct name as Stokes points out). Stokes claims that creationists use such stories to imply that scientists make ridiculous blunders and are likely to be dishonest about many other things too. Note that in Stokes' mind the terms 'scientist' and 'evolutionist' appear to be synonymous. In actual fact, creationists refer to these cases as examples that although most scientists are sincere, they can be mistaken or in error This, of course, holds true for creation scientists and evolutionists alike. No human being is infallible, free from bias, or entirely objective.

Furthermore, Stokes complains that creationists have made no scholarly attempts to excavate, reconstruct and name dinosaur specimens. However, as Emmett L. Williams has pointed out in a previous editorial in this Quarterly, creation scientists do not have access to the funding for research that is available to evolutionists, nor are the establishments where they work always sympathetic to creationist views (Williams, 1988). It is the very attitude toward creationists that Stokes' article fosters that perpetuates such an undesirable situation.

In his book, Taylor warns against uncritical acceptance of artistic reconstructions of dinosaurs, in light of the relative paucity of evidence as to their true life appearance. Stokes caricatures Taylor's position as implying that deceit governs such reconstructions, and asks why Taylor's book contains dinosaur illustrations if this is the case. Stokes has obviously not read Taylor's work very carefully. To quote from the section of the book that Stokes is referring to, Taylor says (p. 14): ". . . no pictures of dinosaurs *in this book or any other* are exactly right. Every dinosaur painting is sure to contain at least some wrong information" (my emphasis).

The contemporaneity of man and dinosaurs is also denied by Stokes, unsurprisingly. He asks why no dinosaur skeletons have been found alongside those of advanced mammals (e.g. man), yet he makes no mention of an article by Woodmorappe (1983) which includes a review of the causes for the virtual absence of pre-Pleistocene human fossils within a Flood geology model. Also he inquires why no mammalian or human footprints are found among those of dinosaurs, and why no dinosaurs appear in cave paintings. Examples of both these phenomena have been documented by creationists, however. Recently, Rosnau, et al. (1989a, b) have referred to quasihuman and quasimammalian ichnofossils which occur in the Mesozoic Kayenta Formation of Arizona along with dinosaur tracks. It should also be realized that ephemeral markings such as footprints require rapid lithification, sedimentation and burial in order to be preserved at all—creationists have little difficulty in accounting for such phenomena! As for cave drawings, Stokes' reading of Taylor's book is selective. On page 39, Taylor provides a photograph of an ancient Indian carving from the Grand Canyon which may picture a dinosaur.

Next, Stokes delves into the realm of Biblical exegesis and criticizes Taylor for an incorrect translation of Job 40:16. However, it seems that on this point Stokes has not 'done his homework' properly. Stokes claims that Job 40:16 says that the strength of 'Behemoth,' which many creationists believe refers to a dinosaur, lies in his "navel," and then questions that dinosaurs had navels. Taylor is accused of cleverly omitting the reference to the navel; Taylor's version says "the muscles of his belly."

However, Young (1939, p. 689) notes that of the three Hebrew words translated 'navel' in the King James Version, only two actually mean 'belly button' (e.g. 'shor' in Ezekiel 16:4, and 'shorer' in Song of Solomon 7:2). However, the word used in Job 40:16 is 'sharir,' and more properly means 'muscle' or 'sinew.' It would seem that Taylor's version is valid and accurate.

Stokes denies that dinosaur graveyards are due to mass catastrophe, either during the Flood or in post-Flood times. He attributes all to ordinary accumulations in bogs, around drying water holes, or on river sand bars. However, many of the accumulations seem to testify to unusual events, and easily lend themselves to catastrophic modeling. According to one's precon-

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ceptions one could take this evidence to represent many local catastrophes within a long-age, uniformitarian framework or as evidence of Flood-burial and rapid post-Flood sedimentation. Other factors (e.g. out-of-place fossils, lack of paleoerosion in ancient strata, evidence from paleoecology of unbalanced and disturbed ecosystems, refutations of radiometric data and evidence of young age for the rocks, etc.) favor the latter option. Examples of such dinosaurian graveyards abound. For example, Norman (1985, p. 76) says:

> Today *Plateosaurus* remains are known to occur in mass concentrations of relatively complete remains, notably at Trossingen in the Federal Republic of Germany, Halberstadt in the German Democratic Republic and La Chassagne in France.

There is also a well-documented *Iguanodon* graveyard at Bernissart in Belgium. Many dinosaur fossils also give clear indications of having been buried recently and rapidly. For instance, in 1925 Charles W. Gilmore described a beautifully preserved, almost intact skeleton of a young *Camarasaurus* discovered at Dinosaur National Monument in Utah. If such a specimen had not been buried rapidly the carcass would have rotted away, or been scavenged by carnivores (Norman, 1985, p. 86). Around the skeleton, and particularly between the ribs was found a thin carbon layer, probably the remains of the creature's skin! Is it really possible that traces of skin could be found after tens of millions of years?

Stokes refers to "scores of fossil forests with trees standing in place" (p. 26). However, many of these deposits have been, or are being reinterpreted in a manner more supportive of Flood geology. For example, the Cromer Forest-Bed Series of East Anglia, England was once considered to represent *in situ* forests. A more modern interpretation is that the tree stumps did not grow in the spot, but were swept into position (Chatwin, 1961, p. 57). The case of the Yellowstone fossil forests is well known to many creationists, and readers of the Quarterly are directed to the works of creationist Harold Coffin for further information (Coffin, 1976, 1979a, b).

Stokes also would like evidence of geological deposits containing mixtures of fossil marine shellfish, land-dwelling vertebrates and vegetation from diverse environments, which he supposes would be laid down in a catastrophic flood. Geology can indeed furnish him with numerous examples. Francis (1961, pp. 18-19) writes of a stratum in England which contains fossilized mosses (freshwater), along with marine crustacea and fish. In fact, he comments that such mixed strata are "well known features of coal measures of all ages." Francis also refers to "the evidence of the fossil-bearing layers of the lignites of Geiseltal in Germany. Here also is a complete mixture of plant, insects and animals from all climate zones of the earth capable of supporting life" (p. 18). In the sequence of strata overlying the Cromer Forest-Beds I referred to earlier is a marine bed containing molluscs of both arctic and temperate species. Wright (1937, p. 110) says of this stratum, "the evidence is conflicting as to the climate." Andrews (1961, pp. 201-202) refers to similar inconsistencies in the flora of the Chalk Bluffs of Central California, and comments: "This occurrence of climatically divergent elements in a fossil flora is not an uncommon problem

" The Eocene London Clay also contains a mixed flora of tropical and temperate species (Andrews, 1961, p. 189). Fritz (1980, p. 309) comments on a similar phenomenon from the Yellowstone petrified forest beds, and says that the mixture of tropical and temperate plants is extreme, and is damaging to the *in situ* theory of how these beds were deposited. Wieland (1989) writes about an Upper Carboniferous deposit of the coal basin of Montceau-les-Mines, near Autun in France which contains a mixed marine-freshwater-terrestrial faunal assemblage which appears to have been entombed rapidly. Finally, Norman (1985, pp. 158-59) comments on a quite recently discovered *Scelidosaurus* skeleton from Charmouth, England, a terrestrial dinosaur found in association with sea-dwelling plesiosaurs and ichthyosaurs.

Evidence that dinosaurs and other large reptiles survived well into historical times is dismissed in a single paragraph without any rationale being given by Stokes for doing so. Yet there have been many evolutionists who have become convinced by the historical, and modern documentary evidence. For example, the world-renowned ornithologist and conservationist Peter Scott, founder of the Wildfowl and Wetlands Trust and the Worldwide Fund for Nature, was personally convinced that a population of large, paleohistoric reptiles was still inhabiting the depths of Scotland's Loch Ness. Roy Mackal, the University of Chicago, has spent much time and effort in his attempts to track down the 'Mkele Mbembe' of the Congo Basin which he believes could well be a living dinosaur. Bernard Heuvelmans draws attention to the numerous examples of 'living fossils' and documents evidence that there are further 'living fossils' (including dinosaurs) still to be discovered (1958). Many other examples could be given–it is surely unwise for Stokes to be quite so dogmatic about the fate of the dinosaurs and other supposedly extinct creatures, when other respected scientists are more open-minded.

Stokes' article contains other comments and criticisms, but this review has answered his main points. The scientific evidence relating to dinosaurs does not lend support to evolutionary hypotheses, but instead confirms the biblical account of earth history. A recent article in the *Journal of the Biblical Creation Society* outlines evidence of design in the dinosaurs, highlights the startling lack of transitional forms or dinosaur ancestors, and shows that the facts more readily confirm creationist views of these magnificent animals (Darrall, 1989). I heartily recommend Dr. Darrall's article, and Paul Taylor's book* to anyone, adult or child, who wants to read an informed account of how the dinosaurs fit into the biblical Creation-Flood scenario.

*Readers may be interested in a recent book review of Taylor's book– *CRSQ* 25:49.

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BOOK REVIEWS

How Life Began by L. R. Croft. 1988. Evangelical Press. Durham, England. 120 pages. $10.00.

Reviewed by David and Kenneth Rodabaugh*

This book presents many recent discoveries, particularly in the field of molecular biology, that render the naturalistic explanation of life's origin impossible and provide strong evidence for special creation. L. R. Croft, a lecturer in the biological sciences at the University of Salford, is quite thorough in displaying why he considers the 'primeval soup theory' to be the greatest scientific myth of all time. He discredits several current theories advanced since Darwin to account for a naturalistic transition from nonlife to life and completes the book by providing strong proof of intelligent design.

The author refutes the evolutionary explanation by detailing biochemical processes and a critical review of his discussion requires greater expertise in chemical and molecular biology than is possessed by the reviewers. Although many areas of the book are quite technical, the arguments are convincing and references are provided for those who cannot verify the finer points from personal knowledge.

The author begins by giving the reader a history of the philosophical and scientific viewpoints regarding the origin of life from Greek civilization up to the present times. This is most interesting as many of us living in societies where religious freedom is granted neither connect evolution with its mythological origins nor consider the influence which atheists and Marxists have gained through its inception into our school systems and scientific communities (pp. 7-13). It is pointed out how our society has blindly accepted as scientific that which is merely a frantic attempt to justify myths through politics and scientific forgery. As an example of this, the author states that originally Darwin himself pointed to a supernatural creator for the origin of life to merely lessen the tumult he knew his book *Origin of Species* would create (p. 21).

Since Darwin, the scientific community has covered up the lack of evidence for such beliefs and derived many theories which they hope will explain their incredible premise. Currently, the most widely held theory of origins is that life on earth arose millions of years ago in a certain 'primeval soup' present in pools of water through a mixture of atmospheric elements with sunlight, electricity or other form of heat. This viewpoint is presented in most public school textbooks on the matter along with evidence which is cited and presumed fact. The book closely examines these alleged facts.

The author demolishes, "The myth of the primeval soup," in Chapter 3.* In considering Miller's 1953 experiment and subsequent experiments where amino acids were formed through applying heat to elements alleged to be in the primordial atmosphere, the author mentions: 1. that these amino acids were racemic (both D and L forms) and thus proteins formed from these would not support life; 2. the majority of amino acids do not belong to the 20 amino acids that occur in natural protein molecules (pp. 40-45). His conclusion is that three decades of experimentation show that small traces of nearly any simple organic compound may be produced, but this is a far cry from the formation of life. He states, "The entire primeval soup story is a classic example of how easily science may enter a blind alley and become inextricably lost" (p. 45).

Several problems in the formation of giant biomolecules are outlined on pages 45-54. One well-known problem in the formation of polymerized proteins in water is that water loss is necessary for this process. Living organisms solve this problem with the presence of enzymes and the molecule ATP. It is clear the enzymes were not present in the primordial soup. Even if they were formed, they would not have lasted long since the primeval soup was by definition a conglomeration of nearly every conceivable chemical substance. There would have been innumerable enzyme inhibitors present to inhibit an enzyme as soon as it appeared. Thus, such molecules could not have formed; however, even with the assumption that they had formed, they could not have remained**

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*Editor's Note: The title of chapter four in Thaxton, C. B., W. L. Bradley and R. L. Olsen. 1984. *The Mystery of Life's Origin: Reassessing Current Theories.* Foundations for Thought and Ethics. Richardson, TX is "The Myth of the Prebiotic Soup." For a review of this book see Williams, E. L. 1986. *CRSQ* 22:200, 201.

**Editor's Note: Readers may be interested in the following articles on this subject: Williams, E. L. 1967. The evolution of complex organic compounds from simpler compounds: is it thermodynamically and kinetically possible? *CRSQ* 4:30-35; Williams, E. L. 1981. Fluctuations as a mechanism of ordering in Williams, E. L. editor. *Thermodynamics and the development of order.* Creation Research Society Books. Terre Haute, IN.

The author shows that a very real problem also arises from the fact that even if a 'soup' of amino acids were formed, there is no basis for its becoming a 'soup' of nucleotides. Nucleotides consist of Base + Sugar + Phosphate. In watery environments the predominant chemical form of phosphorus is phosphoric acid which would naturally combine with calcium and other alkaline earth metals and thus there would be very little dissolved phosphate in the primordial soup. There are also a large number of possible isomers which may result when phosphate is added to a nucleotide. He further states that nucleotides are unstable in aqueous solution and to ultraviolet light. When dissolved in water they tend to break down into their components. Thus, even if nucleotides were formed in the primeval soup they would not have remained intact for long.

Nucleotides form nucleic acids when they polymerize; thus, nucleotides are a prerequisite. If we could not have had a sea of nucleotides, we could not have had nucleic acids which are essential in the formation of DNA and thus essential for life.

It is mentioned how the formation of nucleic acids is again a contradiction to the Second Law of Thermodynamics as it is an uphill process in which energy is gained. When protein or nucleic acid is dissolved in water it breaks down (hydrolyses) into amino acids and nucleotides respectively. A mixture of amino acids in water does not spontaneously join together to give a protein molecule nor does a mixture of nucleotides combine together to give a nucleic acid. This would define an uphill process and be a contradiction to this law.

It is also stated that even if the spontaneous formation of nucleic acid could be explained, life today depends on both nucleic acids and proteins. Nucleic acids require proteins for their formation and proteins require nucleic acids. In addition, we can be certain that they did not both appear simultaneously and thus a classic predicament occurs for which the evolutionist has no answer.

Chiral discrimination and chirality are examined in Chapter 4 and another predicament becomes apparent. Chiral discrimination requires some form of original chirality; however, chirality requires discrimination. Again, which came first? The origin of the genetic code is closely examined in Chapter 5 and it becomes obvious that no explanation exists for the evolution to a triplet code and in fact the only explanation is that it could not have evolved, but must have arisen in a single stroke, which is impossible.

British scientist Dr. Cairns-Smith arrived at his version of the theory of genetic takeover (Chapter 6) simply because he finds all other explanations as "grossly inadequate." He is quoted as writing "Now there might be no need to postulate an earlier kind of life if some minimum-protein system could be conceived of as having formed spontaneously on the primitive Earth. But I do not see such a system as conceivable" (p. 81).

The author goes into detail on Cairn-Smith's theory of genetic takeover. The theory being that two forms of life have existed on earth: 1. our own form; 2. a primary or 'starter' form. The primary form is suggested to be based on the microcrystals of clay minerals. Ten doubts are listed as a challenge to the basics of this theory of genetic takeover and the author points out that although clay synthesis of any kind is difficult to research that it should certainly be possible to demonstrate at least some evidence for its occurrence. Evidently, Cairn-Smith's theory is one which exists although there is neither fossil evidence for clay organisms nor existence of clay organisms today. Additionally, it is pointed out that there has not been shown an active interaction between organic molecules and clay minerals nor any evidence found of natural selection processes taking place in clays today. The theory that life arose from clays is completely devoid of any scientific credibility.

After a discussion of the living cell and the fact that there is a lack of any evidence for its evolution (Chapter 7), the book moves on to discuss additional theories which have been resorted to by some scientists to explain the transition from nonlife to life. Although such theories as extra-terrestrial origins (Chapters 8-10) and the continuous spontaneous generation of life on earth have been considered either devoid of any credibility or mere science-fiction in the past, they are together with genetic takeover becoming a last resort for many scientists who refuse to consider special creation as a plausible option. Continuous spontaneous generation of life from some point on the earth is in the same anti-scientific realm as genetic takeover as no such fountain of life has ever been found nor is there any evidence that such a place exists. The theory is mere speculation and not very popular anymore.

Chemical evolution in interstellar space followed by seeding on earth by either accidental or intentional means is another far-fetched theory which is held by desperate evolutionists. The author discusses in detail the theory that life was seeded on earth through meteorites and presents a very reasonable explanation for the presence of biochemical in some meteorites. Francis Crick's theory of Directed Panspermia stating that microbes were sent to earth encapsulated into the nose cone of a spacecraft is also discussed. It is pointed out that in addition to lack of evidence to support these theories they do not provide an explanation of the transition from nonlife to life. Proposing that life arose in interstellar space and was transferred to earth merely 'passes the buck' of explaining this transition to another section of the universe.

Having strongly refuted all current theories as to naturalistic origins, the author provides strong proof for special creation in the final two chapters. He bases this on Paley's argument that "where there is design there must be a designer and where there is contrivance there must be a contriver" (pp. 127-28), stating that although the Darwinian revolution attributed the work of the great designer to the blind forces of nature we are able today to apply the argument at a microscopic level. In particular, we can apply it to the subcellular molecular world. The author states,

> If we can discover evidence for design then, unlike Paley's case, it cannot be refuted, because there is no evidence that the cell has actually evolved. We simply do not know of any life except that based on cells. Nor is there any evidence that a subcellular form of life has ever existed (p. 128).

The author goes on to exemplify how evidence from the field of molecular biology points to intelligent design by fulfilling two important criteria for testing a scientific hypothesis. That is, the hypothesis of an act of a completed creation at some point in history both enables predictions to be made of which some are verifiable as well as explaining and unifying data that previously was isolated and fragmented. He then presents several supporting instances.

The nature of the genetic code itself points to intelligent design as does the very existence of molecules of perfection. The author cites vitamin B12 as an example of a perfect molecule for which no precursors are found and which, according to evolutionists, has not evolved for billions of years. This, however, contradicts the very essence of evolution as perfection is not attainable and all forms of life are continually evolving according to chance mutations. The mere existence of such a molecule perfectly designed for its role in life can only indicate purposeful and intelligent design. The author further demonstrates mathematically that the chance of the 2000 or so enzymes necessary for life arising spontaneously is about 10 to the 13,000th power and thus impossible. Without enzymes there could be no life and without life there could be no enzymes, thus they must have come about by intelligent design. Combining the above examples with others we can demonstrate design at a subcellular level and so fulfill the first criterion for our hypothesis. The author then points out that the hypothesis of intelligent and purposeful design solves several mysteries which are currently plaguing science. He cites a few examples; such as, molecular interrelationships recently discovered at the subcellular level and the demonstrable lack of intermediate biologies that one finds in nature.

In conclusion, we would certainly recommend this book. It is well organized and provides a strong presentation of the many contradictions facing the evolutionist today as well as providing arguments for special creation. The evidence is based on current discoveries and relates very well to those teachings which are present in our textbooks and classrooms today. The author has done a fine job of accomplishing his purpose. He has provided today's student with an arsenal of evidence and arguments against the theory of naturalistic evolution, a theory which is so widely accepted in most circles of education; a theory with which our young people are being indoctrinated as early as kindergarten. We join the author in his hope of exposing our young people to these facts (see Preface).

Wonderfully Made by A. J. Monty White. 1989. Evangelical Press, 12 Wooler Street, Durham, DL1 1RQ, England. 128 pages. 3.95 pounds.

Reviewed by David A. Kaufmann*

Monty White has written a short, concise primer refuting the basic arguments of evolution and endorsing the arguments for special creation. In seven chapters, he considers why the correct belief on origins is important, what are the differences between the two world views, why the missing gaps in the fossil record refute evolution, how anthro art (reconstructing humans from fossilized remains) is more fiction than fact, how embryonic recapitulation is fraudulent and vestigial organs do not exist, how the real Adam causes enormous problems for theistic evolution and also the speculated fossil people of evolution, and how God reveals Himself to man through His written Word and His works of creation. The book is well-written, easy to read, has a few tables and drawings and cites 152 references both scientific and theological. The theme of the book is from Psalm 139:14 that our created bodies are prime evidence of creation for the Psalmist claims we are "fearfully and wonderfully made."

The author argues well and has a balanced approach. He does not blame all of society's problems on evolution. This would be an oversimplification. The case he makes is that most secularized people use evolution to give them the excuse to reject God and His moral laws—the rules He has given us so that we can lead lives that are pleasing to Him. When we buy a new car or appliance, we get an owner's manual, which gives the maker's instructions for the correct use of the car or appliance. The author claims that the Creator of our bodies has given us an owner's manual for our physical bodies and moral character; it is called the Bible. His advice is to read it, believe it and follow its rules. The book exhibits a sound orthodox Biblical theology. It is solid in its approach to Adam and Eve, Genesis 1-11, the Old Testament, the person of Christ and the New Testament and even the doctrines of the last times (Revelation is not a politico-economic commentary about the Western world in the Twentieth Century but was written to First Century Christians in order to comfort them at that time). This book should be a valuable source for the average creationist to enhance his/her convictions.

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The Origin of Species Revisited, Volumes I and II by Wendell R. Bird. 1989. Philosophical Library. New York. 1114 pages. $65.00.

Reviewed by Wilbert H. Rusch, Sr. *

The above two volume work contains 551 pages in volume I and 563 pages in volume II. In essence it evaluates the two basic theories of origins: the theory more properly known as macroevolution and the theory of what Bird terms 'abrupt origins.'

It is the opinion of this reviewer that the two volumes ought to be in every library of every Christian college in the country. The author frankly states that his purpose is to present a complete picture of the topic of origins, letting the reader choose his own position on the basis of the evidence presented. On the other hand the author does hope to demonstrate that neither theory can be sustained as definite. The two volumes deal in encyclopedic fashion with the two basic questions of origins. Particularly anyone who hopes to produce a credible work on this controversy would benefit by having these valuable reference volumes available.

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Wendell Bird offers the reader a real bargain, including 2,000 quotations and 5,400 footnotes. This information will give the prospective purchaser an idea of the scope of this work. Another plus is the prolific use of tables to organize comparisons of ideas and concepts for the two positions. Certainly both volumes show balanced and meticulous scholarship.

The author does his best to ensure that there is no misrepresentation of any writer's position. Therefore authors who are macroevolutionists are so identified by means of asterisks after their names. Also in that spirit, Volume I has a preface of two essays, one written by an evolutionist and one by a non-evolutionist. Volume II has two prefaces written by evolutionists and one by a non-evolutionist.

Volume I is sub-titled *The Theories of Evolution and of Abrupt Appearance.* The prefaces are written by Dr. Gareth J. Nelson, an evolutionist, and by Dr. Dean H. Kenyon, a non-evolutionist. Dr. Nelson is on the American Museum staff, and Dr. Kenyon is on the faculty of San Francisco State University. This volume includes the subjects Biological Evolution, Biochemical Evolution and Cosmic Evolution. It contains an encyclopedic evaluation of the essentially scientific aspects of the controversy. It evaluates challenges to orthodox Darwinism. Every nuance of many of the current origin theories is explored.

Volume II is sub-titled *The Theories of Evolution and of Abrupt Appearance.* The prefaces are written by Dr. Robert M. Augros, an evolutionist, and Dr. W. Scot Morow, also an evolutionist, as well as by Dr. Russell L. French, a non-evolutionist educator. Dr. Augros is a member of the faculty of Saint Anselm College, and Dr. Morow is a member of the faculty of the University of Tennessee. This volume includes the topics Philosophy of Religion, History of Science, Educational Theory, and Constitutional Law.

In Volume II the various historical, educational and constitutional aspects of the origin controversy are evaluated. Naturally, given the author's background and experience, he certainly can speak with authority on matters of constitutionality. This is particularly true with regard to such topics as academic freedom, as well as the separation of church and state. As the primary attorney who appeared before the U.S. Supreme Court and recently argued the major case on these matters, he is experienced in this area of knowledge and speaks as an informed expert.

This reviewer would recommend that the prefaces to both volumes be included in the reading of the work. Particularly since opinions from both sides are presented, thus making possible comparisons. In addition, I found the prefaces both interesting and instructive.

Dr. Dean Kenyon has this to say in his preface:

> Thanks to W. R. Bird, we now have a first-rate, comprehensive summary of all the major facets of the current controversy on the subject of origins . . . in a clearly organized, richly documented scholarly compendium . . . Both the scientifically literate layman and the professional scientist will find this two-volume set uniquely valuable both as a reference manual and as a work to be read and savored from cover to cover . . . This book, better than any other of which I am aware, presents an intellectually balanced discussion of competing substantial claims in the scientific study of origins and related issues . . . The aim is not to refute or establish one particular view, but in the author's words, 'to defend the viability of alternate positions,' . . . Well done!

I must admit that the work is very heavy reading. Copious use of classical Latin and Greek sayings add to this situation. It is not a work that lends itself to reading in one sitting. Rather at the start, selections could be made of various topics that might be of particular interest to the reader.

However, as time goes on, people interested in the general topic of origins will find themselves reading additional sections. Actually the book is best treated as a reference work or an encyclopedia. Neither is this a work which can be used uncritically by a creationist who is an utter layman in the field of science. Its use requires very critical reading as well as understanding.

Science, Scripture, and the Young Earth (Revised Edition) by Henry M. Morris and John D. Morris. 1989. Institute for Creation Research. El Cajon, CA. 95 pages. $3.95.

Reviewed by Emmett L. Williams*

Father and son team up to answer many of the attacks against scientific creationism leveled by evangelical who accept evolutionism and uniformitarianism. Most of the attacks have been aimed at *The Genesis Flood* and it is appropriate that one of its coauthors answers the charges. As the Morrises note, some of the information in *The Genesis Flood* is outdated (first published in 1961) and later scientific creationist field research in geology which shed new light on the catastrophic Flood model are ignored by the antagonists. This is typical of both naturalists and their theistic apologists. They are neither conversant with the latest creationist thinking nor will they bother to read creationist scientific journals and if they do, they lack understanding of what is being said (likely scanning, rather than studying the articles).

The answers given by the Morrises are very effective. Centering their counterattack on the publications of Davis Young, the scientific weaknesses of his arguments are exposed. In doing so the authors present some recent data illustrating the bankruptcy of uniformitarian and old earth concepts. They consider that the so-called progressive creationist and day-age theories are insults to the Creator (Chapters 1 and 2). They are nothing more than naturalism garnished with theistic overtones to appear "spiritual." When it comes to a confrontation between Biblical revelation and naturalistic hypotheses, the progressive creationists side with the latter.

The Morrises show that modern geology is beginning to recognize the major role of catastrophism in shaping the structure of the earth. The rapid formation of fossil reefs and evaporates (actually precipitates) [Chapter 6], lakes, glaciers and deserts (Chapter 7) are discussed. The young earth concept is defended by explaining the incorrect assumptions used in radiomet-

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ric dating, specifically the uranium-lead, potassium-argon and rubidium-strontium methods (Chapter 8). Actual failures of and problems with the methods are discussed in Chapter 9. Obviously there is no method that can scientifically date the age of the earth, however old earthers generally choose those radiometric methods that agree with their preconceived notions. If the results from these methods do not agree with the "accepted" geologic time table, they are discarded anyway! "Scientific" prejudice abounds.

Chapter 9 reviews the evidences for a young earth, particularly the pioneering work of Dr. Thomas Barnes on the decay of the earth's magnetic field and the more recent work of Dr. Russell Humphreys in this area, all of which have been reported in the *Creation Research Society Quarterly*. The magnetic *data* fitted into either the Barnes or Humphreys model indicate an upper limit for the age of the earth at 10,000 years. The foolishness of the dynamo model is explored. Some recent creationist research on the age of the earth is discussed in Appendix A. The fossil record in relation to the Flood as the best explanatory model is presented in Chapter 11.

Even after all of the evangelical accommodation and subservience to naturalism the compromisers were attacked viciously by evolutionists as a reward for their efforts (Chapter 12). Nothing but complete capitulation will satisfy atheistic anti-creationists. Henry Morris has long pointed out the futility of compromising Biblical revelation and the resultant disastrous consequences. The Creator is neither honored nor is His cause helped by the defense of anti-God systems.

This book is an excellent brief treatise in defense of recent creationism and the global Flood.

*The Long War Against God** by Henry M. Morris. 1989. Baker Book House. Grand Rapids. 344 Pages. $21.95.

Reviewed by Daniel P, O'Deens**

The title of this book by Henry Morris, *The Long War Against God*, succinctly conveys the purpose of the author. He firmly states "The denial of God—rejecting the reality of supernatural creation and the Creator's sovereign rule of the world—has always been the root cause of every human problem, thus "the long war against God" (p. 15).

Morris' thesis is taken from his belief that this denial of God, is the "sacrosanct doctrine of evolution." Morris purposes to show that evolutionary theory does indeed dominate modern thought in virtually every field—every discipline of study, every level of education, and every area of practice.

In the initial chapter of the book Morris demonstrates that evolution is not merely a biological theory of little significance. It is a world view diametrically opposing the Christian world view. He points out that liberal theology is one of its beginning stages, further leading to a complete atheistic view.

In the following chapters Morris shows that modern-day evolution did not begin with Darwinism. Morris' study is well documented, as he traces evolution's origin back to Nimrod and the tower of Babel. The author does not stop at this point either: He inferentially makes a strong case that Satan himself, the father of lies and deception, actually believed that he and God were products of evolution, stating that Satan really did not believe that God was his Creator, thus answering the agelong question—How can Satan, such an intelligent creation, really believe that he can be victorious over God? In light of this evidence the author states "it would seem that the only possible alternative solution that Lucifer could imagine would be evolution" (p. 258).

There is a law called cause and effect, which is basic in science and in all human experience: "Effects are invariably assimilated into their causes" (p. 92). As a strength to the writer's case, he quotes Jesus' saying, "A tree is known by its fruits." A good tree will produce good fruits, a bad tree produces bad fruits. The evolutionary tree, has to date, produced nothing but bad fruits (p. 92).

The author is very matter of fact in stating that the creation-evolution issue "is not merely an academic question in biology or geology; rather it is nothing less than the touchstone of human belief and behavior" (p. 93). He is saying, choose your religion: Will it be God-centered or man-centered, theistic creationism or evolutionary humanism? This is perhaps one of the most accurate observations in his book, that facts or no facts, the real question is, is your faith in God or man?

A strong point is seen in the attempt to show that the progression of Charles Darwin is very indicative of many who follow after evolutionary thought. Morris shows that Darwin's only degree is in divinity, but from there he began to reject the Old Testament, and soon after gave up the New Testament, for he realized that the Old and the New Testaments comprise a great unity, and they stand or fall together. Darwin elaborates:

> I can indeed hardly see how anyone ought to wish Christianity to be true, for if so the plain language of the text seems to show that men who do not believe, and this would include my father, my brother, and almost all my friends, will be everlastingly punished. And this is a damnable doctrine (pp. 94, 95).

Morris is correct in his evaluation that Darwin denied the Bible because its truth was painful. His theories thus stemmed from convenience rather than fact or scientific reasoning.

Another strong point in Morris' book is his fair warning that evolutionism is deeply affecting evangelical schools and churches. The author points out several schools and church denominations, now gone liberal, who were once orthodox and zealous for the Scriptures. Morris' evaluation is correct in stating:

> Some of these institutions have traveled down the road of compromise with evolutionary humanism farther than most, but many evangelical today seem to have embarked on the same icy road, unaware of the dangers ahead and impatient with those who would warn them (p. 101).

*Please see another review of this book: Lillo, C. L. 1990. *CRSQ* 27:73,74.

**Daniel O. O'Deens, B.S., 58343 Apple Road, Osceola, IN 46561.

Morris believes that the failure of Bible-believing Christian churches and schools to aggressively defend and promote true biblical creationism is a major cause of the takeover by evolutionary humanism of our entire society. Morris says "the greatest tragedy involved in trying to compromise Scripture with evolution of course is that evangelical thereby are denying the very Word of God" (p. 109).

The reviewer found most interesting, Morris' documentation on Isaac Asimov who states, "I am an atheist. I do not have the evidence to prove that God doesn't exist, but I so strongly suspect he doesn't that I don't want to waste my time" (p. 114).

> He simply believes in humanism and atheism because that is what he wants to believe. The same is true for every other devotee of this man-centered religion. Yet they commonly deride creationism because it requires religious faith (p. 114).

One naturally thinks of Psalm 53:12: "The fool hath said in his heart, There is no God."

Even though Morris believes that evolutionary theory is an agelong conflict, he gives an interesting viewpoint of evolution through the guise of the New Age. The author points out that:

> New Age mentor Pierre Teilhard de Chardin vigorously denied that he was an atheist, he even claimed to be a creationist, however he meant that God used evolution to create. He said, 'God canner create, except evolutively.' to say such a thing is really saying that God is not omnipotent, and therefore not really God. Then God is nothing but Evolutionism, and evolution is the "creative" power of the cosmos, creating more and more complexities as time advances (p. 127).

Morris quotes Joseph Sobran, "the fetus is in the early stages of development a "lower" form of life, and this is what they mean when they say it isn't "fully human" (p. 138). The author is correct in saying, "when we start justifying abortion what is next, infanticide, exterminating unhealthy children, or the diseased,–it's a progress that can't be stopped" (p. 140). The process eventually leads to euthanasia. The reviewer agrees with Morris that "once euthanasia is accepted one can easily foresee that it will soon come to be applied to anyone who is not capable of contributing to the social process." Once euthanasia is accepted it will not be long until the mentally defective will be eliminated. Morris quotes Peter Singer of Right to Die Societies as saying, "Mental defective do not have a right to life, and therefore might be killed for food—if we should develop a taste for human flesh—or for the purpose of scientific experimentation" (p. 140). One can easily see from Morris' reasoning and documentation that our entire society is affected by evolutionism, "the survival of the fittest" (p. 39). One can also see that "evolution is not a modern scientific theory at all, but only the ancient rebellion and 'perversion' of men against their Creator" (p. 151).

The author shows the value of proper Biblical exegesis when he speaks concerning Augustine and Aquinas. He states,

> The end results of the teachings of Augustine and Aquinas, and other well intentioned theologians of the time was an undermining of biblical authority. This freedom to interpret the creation record non-literally, if current science should so indicate, could obviously be applied anywhere else in the Bible if it became expedient to do so. The problem with this kind of Biblical exegesis is that it completely undermines the basic principle of biblical authority, since it enables the expositor to explain away any passage that seems to conflict with current scientific, philosophical ecclesiastical, or ethical opinions (pp. 205, 206).

He traces all the religions of the world back to the "mother of harlots," Babylon.

> All the different religions and philosophies of the world have been shown to be merely different varieties of evolutionism. With all their differences, they are alike on one essential—namely, rejection of the creator and his purpose in creation (p. 244).

Morris says,

> It is no accident that the writer of the final book of the Bible, looking back at its earliest records, ties the end-time conditions of the world to its beginnings, speaking of Mystery, Babylon the Great, the Mother of Harlots and Abominations of the Earth. Revelation 17:5 (p. 249).

Morris gives great presuppositional evidence from John 8:44, stating that if the 'Mother of Harlots' is Babylon, then Satan is the 'Father of Lies.'

> Ye are of your father the devil, and the lusts of your father ye will do. He was a murderer from the beginning, and abode not in the truth, because there is no truth in him, When he speaketh a lie, he speaketh of his own, for he is a liar and the father of it (p. 255).

Morris has completed his task. He takes the reader back to Lucifer, and his rationale, as to how he believed that he could defeat his Creator . . . that is, "he did not believe that God really was his Creator" (p. 258). The only possible alternative solution that Lucifer could imagine would be evolution. Therefore, Morris states,

> The first evolutionist was not Charles Darwin, or Lucretius, or Thales, or Nimrod but Satan himself. He still believes he can defeat God, because, like modern 'scientific' evolutionists, he refuses to believe that God really is God (p. 260).

This is a battle between darkness and light, against God and Satan, and against believers and the principalities, and powers, and rulers of darkness, and against spiritual wickedness in high places. Satan truly is at the helm of the "Long War Against God." Those who read this book, will see that God is not defeated, He is victorious, and that by placing your faith in Jesus Christ, the Creator of the world, the redemption of the world, and the reconciliation of the world, you will be victorious as well.

LETTERS TO THE EDITOR

Young Universe

Still another young-universe astrochronometer can be added to the list thanks to an article by M. Waldrop (1987). In order to grasp the significance of the data, one must first ignore the author's conclusions.

First the data: the author uses a radioactive nuclide measured in the sun and 20 nearby stars. The measured thorium-232 has a 14 billion year half-life, decaying to stable neodymium 142. The author notes, "What I expected to find was a change in the ratio of thorium to neodymium between the oldest and the youngest stars." [He] expected that the ratio would be as much as two or three times smaller in the older stars because the thorium would have had more time to decay. What he actually did find, however, was essentially no variation at all in the thorium-neodymium ratio. "Virtually all the original thorium is still there, even in the oldest of the sampled stars" (pp. 361-62).

The data suggests a date too young to be measured by this means of calculation. However, because of philosophical bias, the author concludes that the galaxy is "only" 10 billion years old. The universe, then, he supposes to be about 12 billion years old. Note, however, that the raw data is that all the original thorium is still there. The indicated age is therefore too young to measure.

Reference

Waldrop, M. 1987. A younger universe is seen in the stars. *Science* **237:361-62.**

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Genesis and Genetics Continued

Raaflaub (l990, p. 150) bases his criticism on the adjective "perfect' and uses some rather specious comparisons in an effort to prove my position on Genesis 6:9 to be in error. The key phrase, however, is "perfect in his generations"; i.e. Noah was "perfect in his generations." "Generations," here is translated from the Hebrew word "toledah," meaning "descent," or "family"; i.e., "genetically." Strong (1894, p. 123) gives no other definition for "toledah"; therefore, the subject passage states that Noah's ancestry was perfect. If Raaflaub wishes, he can change "perfect" to "blameless." as he insists, without having any effect on the fact that the passage refers to Noah's ancestry. But are we to assume that in his reference to burnt offerings the sacrificed animal is being described as "blameless"?

In spite of Raaflaub's insinuation that I have used my imagination, I feel that any open mind will see that I have precisely adhered to the Hebrew in this instance. As to the lack of certainty that the human stock has been contaminated by the genes of fallen angels, Genesis 6:4 reads as follows:

> There were giants in the earth in those days, and also after that, when the sons of God came in unto the daughters of men, and they bore [children] to them, the same [became] mighty men of valor.

Raaflaub concedes that my position that this is evidence of genes contamination is one acceptable interpretation of this passage, but states that there are others. He also states that I assume that my interpretation is fact. I would be less than honest if I did not believe my position on the subject to be correct. I also cannot see how I can believe otherwise until someone shows me how I am in error, which he has failed to do. It is easy to state that there are alternate interpretations to the subject passage; it is another thing entirely to produce them. Before Raaflaub begins to denounce my interpretation, I believe he should provide at least one alternate interpretation, which he has not done. I cannot see how he can justify accusing me of error until he does.

References

CRSQ—Creation Research Society Quarterly.

Bray, R. 1989. Genetic variability. *CRSQ* **26:67.**
Raaflaub, V. A. 1990. Genesis and genetics. *CRSQ* **26:152.**
Strong, J. 1894. Strong's exhaustive concordance of the Bible. Abingdon Press. New York.

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Response to Bray

I commend Raymond Bray for his interest in determining more accurately the meaning of Genesis 6:9. Trying to do so on the basis of *Strong's Exhaustive Concordance* can be problematic, however, as *Strong's* gives only one or a few simplifed meanings for any given word. Dictionaries do not establish meaning; at best they will reflect, through careful analysis of the available literature the semantic range a word may have—the precise meaning will be determined by context. But one should be wary of shades of meaning that are foreign to the basic meaning range noted in the better dictionaries.

The basic meaning of *tamim* (KJV "perfect"), is one of "completeness, integrity" (Brown, et al., p. 1070). The concept of "genetic perfection" is foreign to the word. As applied to a sacrificial animal, it means an animal which is "complete'' -no missing limbs, or other visible defects which would render it unfit for sacrifice. If one were to take Bray's meaning of "genetic perfection," one would then have to ask what sort of scientific means the patriarchs could have used to determine which animals were genetically perfect and which were not!

Bray's reference to "toledoth" in Genesis 6:9 is in error. That word is used in the beginning of the verse but not in the phrase "perfect in his generations" (KJV). The word there is *dor* which means "lifespan, period, age." Thus the NIV correctly renders this verse "blameless among the people of his time," referring to his exemplary lifestyle.

A little commentary checking will show that it is not certain that "sons of God" in Genesis 6:4 means angels (Stigers, p. 99). Nor is it likely that "nephilim" should be translated "giants" since the root means to "fall upon" or "attack" and has nothing to do with

size. In Numbers 13:32, 33 (Note: Post-Flood) the Nephilim are a group *within* the tall Anak people. The meaning of "bandits" or "attackers" seems to fit the context of Joshua 11:7 and Job 1:15. Also, it is less than certain that the *nephilim* of Genesis 6:4 are the same as the "mighty men of valor" in the same verse. In fact, in the Hebrew the verse seems to imply that the nephilim were on the earth (also can be translated "in the land") before as well as *at the time* when the "sons of God" came in to the "daughters of men" (Stigers, p. 99). If that should be the case, then the *nephilim* would not be the offspring of the latter but simply contemporaries.

There is much more to understanding what is written in another language than using a brief dictionary. I would suggest that non-linguists check their ideas with someone who has a good working knowledge of the language in question, before putting those ideas in print. They have nothing to lose and much to gain.

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Brown, F., S. R. Driver and C. A. Briggs. 1976. A Hebrew and English lexicon of the Old Testament. Clarendon Press. oxford. See also W. L. Holladay, Editor. 1988. A concise Hebrew and Aramaic lexicon of the Old Testament. W. B. Eerdmans. Grand Rapids, MI

Stigers, H. G. 1976. A commentary on Genesis. Zondervan. Grand Rapids. See also G. C. Aalders. 1981. Genesis, Volume 1 in the Bible student's commentary. Zondervan. Grand Rapids, MI. p. 156. Also H. C. Leupold. 1942. Exposition of Genesis. Wartburg Press. Columbus, OH. p. 257. It is agreed that some modern scholars DO take "sons of God" as referring to angels, although this view is usually linked to a mythological origin for this passage. All I claim here is that there are difficulties with the view that supernatural beings are meant.

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Speed of Light

Statistics Professor Michael Hasofer (1990) at the University of New South Wales has looked at the question of the decline of the speed of light (c). He concludes that weighted methods of data analysis are appropriate, but that the data fits a polynomial rather than a straight line.

The journal in which the Hasofer report appears also carries other articles on c decline, both pro and con. This journal will henceforth appear as a bi-annual scientific forum available from Australia or the United States. Write to the Foundation for subscription details.

Reference

Hasofer, M. 1990. Speed of light variation. *Ex Nihilo Techincal Journal* 4:189-95.

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Statistical Corrections

Please allow me to make some corrections to the tables of data in my article on the statistical analysis of the speed of light (Montgomery, 1990). I have found an error in my spreadsheet formula which referenced the wrong cells. In most cases the confidence levels are reduced by a few percentage points although some remain unchanged.

The corrected values are as follows:

	T-Test Confidence Level (%)
c-data	
Roemer	97
Bradley	94
Toothed wheel	80
Rotating mirror	94
1960-83	85
c-dependent	
h/e	99.9
Hall resistance	91
Electron mass	92
c-independent	
Rydberg	61
Boltzman	94
Bohr magneton	97
Electron charge	55

This changes the total number of rejections of the constancy at accepted values from 38 to 37 or 82% instead of 84%. The MSSD and run tests are not affected. There are still 18 of 20 test rejections of constancy with time.

Reference

Montgomery, A. 1990. Statistical analysis of c and related atomic constants. *Creation Research Society Quarterly* 26:138-42.

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The Creation Research Society maintains an informal employment bureau for the benefit of voting or sustaining members of the Society. Prospective employers are encouraged to submit information regarding openings. There is no charge for registering a position or requesting information about available opportunities. Send announcements or requests to Dr. Wayne Frair, The King's College, Briarcliff, NY 10510.

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QUOTE

Karl Marx wanted to dedicate his book to Charles Darwin, but Darwin wisely refused. He was not, after all, a Darwinist! The precise connections between Charles Darwin and evolutionism as depicted in the prevailing mythology, I leave to the experts to trace. As the matter is popularly understood, evolutionism is materialist and mechanical. As Jacques Barzun describes it:

> "The sum total of the accidents of life acting upon the sum total of the accidents of variation thus provided a completely mechanical and material system by which to account for the changes in living forms. "

Viewed in these terms, evolutionism connotes the idea that life originated accidentally as a stirring in the primeval ooze, and that living things became what they are now by random interaction with the physio-chemical environment, moved by no purpose, aiming at no goal. Darwinism offers an account of organic development which has no need to invoke intelligence of any kind to guide it; only chance and necessity.

Opitz, Edmund A. 1978. The uses of reason in religion. *lmprimis* 7(2):3. Hillsdale College, Hillsdale, MI.

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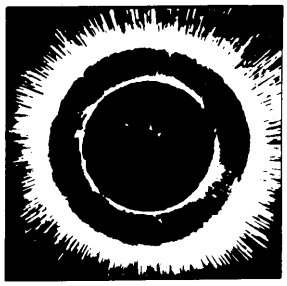

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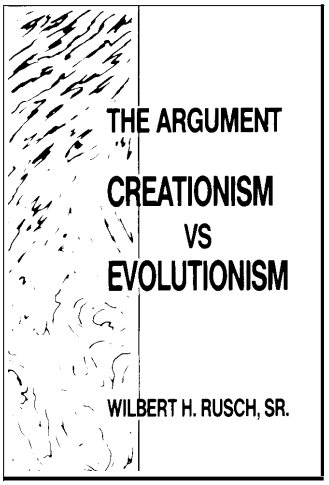

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