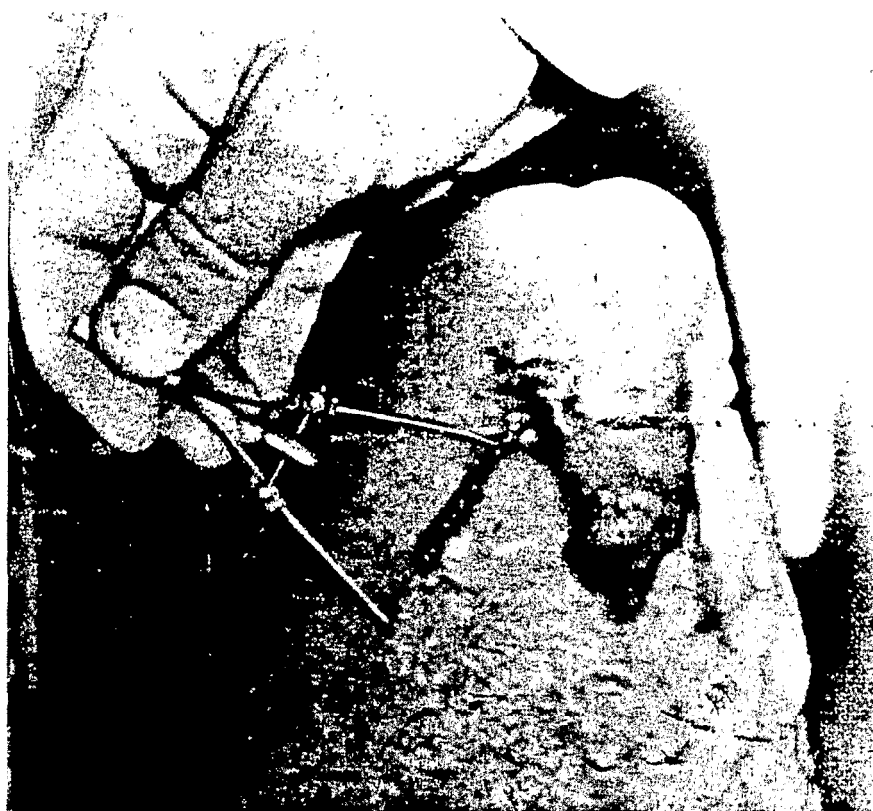


CREATION RESEARCH SOCIETY QUARTERLY



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

CREATION RESEARCH SOCIETY QUARTERLY

VOLUME 8

SEPTEMBER, 1971

NUMBER 2

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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 creationism, with a current membership of about 400 voting members (with graduate degrees in science) and over 1300 non-voting members. The *Creation Research Society Quarterly* has been gradually enlarged and improved and is now recognized as probably the outstanding publication in its 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.

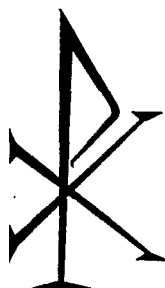


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COVER ILLUSTRATION

The cover illustration shows a bat that was cemented inside a stalagmite at Carlsbad Caverns, New Mexico. This supplies a clue to the problem of stalagmite growth rate and may be used to point out that uniformitarians are in great error to assert that stalagmite accretion requires multiple thousands of years. Evidently it occurs so rapidly that a bat can be entombed before action of bacterial decay and/or predators!

This photograph appeared in the article, "Carlsbad

Caverns in Color," by Mason Sutherland, *National Geographic Magazine*, CIV(4):433-488, October, 1953. It is used by permission of the photographer, Mr. "Tex" Helm, of Carlsbad, New Mexico. The black and white copy work was done by Mr. Jack Moten, Jr., of Micrographics, Inc., Newhall, California. Mr. Robert Harris is to be commended for "discovering" this photographic evidence and authoring a review which appears on page 144 of this issue.

EDITORIAL COMMENTS

Evolutionists sometimes assert that evidence from fossil horses alone is enough to convince any thinking person that evolution or "change of kind" has taken place. Mr. Frank Cousins has undertaken to review the late Dr. Heribert Nilsson's classic arguments against the validity of this supposed horse series. Mr. Cousins' article is a portion of a currently published book, the third volume of *A Symposium on Creation* (Edited by Mr. Donald Patten, Baker Book House, Grand Rapids, Michigan).

Through use of Nilsson's data and evidence of his own, Mr. Cousins builds a strong case to suggest that the series of "horses", is no series at all but an artificial collection of several unrelated types. Thus C. R. S. readers will have documentary evidence to suggest the fossil horse data fit best with the special creation of several distinct groups!

Both an article and a letter in this issue deal with the philosophical character of evolutionism. In "The Scientific Character of The Evolution Doctrine," Dr. William Ouweneel concludes that evolutionism is not scientific and not a theory! He asserts rather that it is a materialistic doctrine and this is an extremely valid point. By the same token, in his instructive letter Rev. T. Robert Ingram maintains that creationists should not refer to evolutionism as a "faith," because it is actually unbelief or "unfaith" as he puts it. We will do well not to suggest that evolutionism is in any real sense a religious alternative to Christianity.

We are pleased to present in this issue an article by Dr. Emmett Williams, Jr., that is bound to become a classic in the fields of origins and thermodynamics. It is sometimes stated or loosely implied that activity of living systems is somehow not limited by the second law of thermodynamics (which involves the concept, of course, that all systems tend to a condition of greatest entropy, randomness, or disorder).

While Dr. Williams admits that his paper is a pioneering venture into a relatively uncharted area, he shows that life too is ultimately subject to decay and destruction. Probably only our most mathematically gifted readers will be able to follow each step in Dr. Williams' equations; yet, we will all benefit from his discussion and conclusion that evolutionists cannot escape the second law of thermodynamics. He adds that the complexity of living systems remains as a tribute to God's power in creation.

Most creationists deal with the fitness of life for its environment which includes the so-called "natural laws" of physics and chemistry. Professor Harold Armstrong "turns the tables" in his article "On the Fitness of The Laws of Nature"

by asking just how such uniform laws might have arisen!

In his interesting article about the origin of woman, Dr. Robert Koontz does not attempt to supply exact creation mechanisms. Instead, he reviews the subject in light of several biological principles. While the creation of Eve was obviously miraculous, Dr. Koontz concludes that it is by no means out of keeping with the factual fabric of biology.

The book, *Without Form and Void*, published by Dr. Arthur C. Custance, has received considerable attention because it deals with the question of interpreting Genesis 1:1-2. Although it is highly theological and philological, this book will have an interest to origins students because it comes as a definitive 20th century defense of what has come to be called "the gap theory." In the book, Dr. Custance questioned some materials previously published by Creation Research Society, authored by Dr. John C. Whitcomb, Jr., editorial staff member (See C. R. S. *Quarterly* 4(2):69-74, and also an article by Dr. Robert Reymond, 4(2):75-80).

Dr. John C. Whitcomb, Jr., and Dr. Charles R. Smith have co-authored a review of Dr. Custance's book. If *Without Form and Void* is a definitive defense of the gap theory in our day, as Whitcomb and Smith indicate, then surely the review by these men is a definitive answer to the best arguments that can be raised in defense of that theory.

In his interesting "Comments . . ." column, Professor Harold Armstrong reviews literature pointing to the amazing fact that competition between two species of vinegar flies simply did not exist! His reading on the oceans and on the radio-galaxies brings important evidence favoring a youthful universe.

In our study of the Flood catastrophe, we sometimes forget the many unique features of Noah's Ark. In his short article, "The Ark of Noah," Dr. Morris deals with the properties of this craft, the plans of which were given to Noah by God Himself. This article should go a long way toward dispelling the false but common notion that somehow Noah's ark was unseaworthy.

Mr. Robert Harris' review of a *National Geographic Magazine* article, together with the cover photograph by Mr. "Tex" Helm, are interesting evidence that stalagmites may not take long ages to form (as some uniformitarians assert). Certainly thousands of years could not have elapsed while this bat was being covered in a calcareous matrix! Readers should consider this ministry of supplying possible cover photographs for the *Quarterly*. A photograph, together with a brief

article or description, may be sent to any one of the three editors for consideration and possible publication. Let's see if we can produce some more truly excellent cover photographs for issues ahead.

With a bit of good humor, Dr. William J. Tinkle describes the plight of a German visitor to this country trying to understand the monstrous irregularity of definitions in the English language. He uses this as a springboard to present Dr. Morris' fine answer to a Mr. William Hines, who had erroneously asserted in a news release that creation scientists were an "obscure group of men supported by a group of bemused laymen." Readers will appreciate the restrained, dignified, and accurate response that President Henry Morris gave to this irresponsible critic.

Actually, this issue contains a trilogy of short but valuable articles by Dr. Morris. The first, of course, is his article on the Ark. The second is the reply to Mr. Hines. The third is a set of proposals for science framework guidelines. In a day when many school boards and individual teachers are searching for a way to overcome the prevailing lop-sidedness and overriding evolutionary dogmatism in education, these guidelines should serve as a basis for action, and hopefully many boards and individuals will use these statements of Dr. Morris in revising their origins curriculum. How about copying this article and showing it to a teacher or principal that you know?

We are indeed grateful to Dr. John Klotz, Dr. Karl Linsenmann, and Dr. Duane Gish (members of the Constitutional Revision Committee) for their careful preparation of a By-Laws and a revised Constitution which were adopted by the Board of Directors at the annual meeting, April 17, 1971, at Ann Arbor, Michigan. Readers will soon find that these By-Laws will help in the effective management of C. R. S. business. Comparison of this revised Constitution with the original [C. R. S. *Quarterly*, 3(1):3] will demon-

strate that Board members have strengthened (not weakened) the stand of the Creation Research Society, as a group of scientists committed to the publication of information in support of special creationism.

We are also indebted to Dr. Tinkle for his report of the annual meeting which we present, as usual, in the September Quarterly. In addition, Dr. Larry Butler's report on decisions of the Research Committee will bring readers up to date on progress in the area of establishing basic research projects through Creation Research Society funding.

While the great Apostle John was under banishment at the Isle of Patmos, he was commissioned in the following manner: "Write the things which thou has seen, and the things which are, and the things which shall be hereafter . . ." (Rev. 1:19). We praise God that He is raising up men in the circle of Creation Research Society to write about "the things which are . . ." as a tribute to the Lord who created all these things.

A burning zeal can come in the heart of a man of science when he realizes that the very subject matter of his field was fashioned by the Triune God of scripture who "was, and is, and is to come." Fortunately, some of these same scientists feel constrained by the Holy Spirit to write about the Creator's role in nature and to make their testimony known in scientific terms that all their students and scientific colleagues may read.

We trust that more Christian men of science will catch this vision to make their faith known by careful, documented research. We are grateful for the obvious strength of Creation Research Society which is a direct evidence of God's blessing on this group of scientists who have said, "here we stand, God helping us, we can do no other."

GEORGE F. HOWE
Editor

COMMENTS FROM PRESIDENT MORRIS

Creationists, by definition, are vitally concerned with scientific cosmology, the "study of the cosmos". We are convinced that scientific facts can be understood better in a creationist cosmological framework than they can in terms of an evolutionary cosmology. However, in the last analysis, we can acquire definite knowledge of the events of creation only through faith in the written revelation of those events as given by the Creator.

And if revelation is necessary for full understanding of the creation of all things, it is even more so for the *consummation* of all things. Cosmology includes eschatology (the study of last things) as well as cosmogony (the study of first things). A creationist cosmogony leads naturally and fittingly to a creationist eschatology. A uniformitarian, evolutionary history would logically imply a uniformitarian, evolutionary future.

Isn't it interesting and significant, therefore, that our latter-day evolutionary philosophers are so concerned about an imminent cataclysmic termination of the evolutionary process? Scientists, who are convinced that genetic mutations have been the cause of evolution, have been trying, nevertheless, for two decades to "ban the bomb" (in this country, that is, not in China or Russia!) on the ground that genetic mutations from fall-out must be stopped, lest the human race die out as a result. The peace-at-any-price ("better red than dead") belligerents have for the most part issued their predictions of imminent nuclear destruction from the philosophical platform of an anti-catastrophic, evolutionary humanism.

More recently our "instant" environmentalists have been citing the statistics of population explosion and environmental pollution as evidence of the imminent death of mankind (unless, that is, we turn over to an intellectual elite full control of all future genetic and economic decisions!). Such grim prophecies of approaching doomsday somehow seem discordant in the context of the supposed historical and pre-historical evolutionary progress in which the great majority of concerned ecologists firmly believe.

It is true, of course, that the threat of nuclear holocaust, genetic contamination, and environmental disintegration are very real threats. But the point is that they conflict with evolutionary premises. They speak rather of sin, the curse, and final judgment. Catastrophism is the theme of much of modern secular forecasting, but catastrophism ought to imply divine displeasure, not humanistic optimism. Ultimately; catastrophism presupposes creationism.

People sense this truth even though their naturalistic prejudices react against it. In any

case, the climate of opinion today seems more amenable to a strong proclamation of Biblical creationism and catastrophism than it has for more than a hundred years.

I am not suggesting that we are about to see a great spiritual awakening of some kind. The forces of atheism are more powerful and blatant than they have ever been. But even while the world seems to be descending rapidly into a chaos of violence and wickedness unparalleled since the days of Noah, there are also great numbers of people, both young and old, who have become aware of the real nature of the titanic spiritual conflict raging behind the scenes, and are ready to turn back to the world's Creator as the only hope of the world's deliverance.

There are a number of Biblical intimations of such trends in the last days. Peter's prophecy (II Peter 3:3-13) notes the predominance of evolutionary uniformitarianism in the last days and urges man back to an acceptance of creation and the flood as the refutation of this system.

To the Laodicean church (Revelation 3:14-22), so characteristic of the spiritually tepid church of the last days, inundated in materialism and secularism, Jesus Christ begins His stinging rebuke of its worldly philosophy by identifying Himself to them as "the faithful and true witness, the beginning of the creation of God" (Revelation 3:14), thus seeking to call its followers back to faith in Himself as true Creator.

Similarly, throughout the sequence of eschatological narratives recorded in the book of the Revelation, references to creation are frequently inserted. For example, the elders around the throne sing, "Thou hast created all things and for thy pleasure they are and were created" (Revelation 4:11).

And again, the mighty angel, as He comes down to claim dominion over both earth and sea, does so in the name of Him "who created heaven, and the things that therein are, and the sea, and the things which are therein, that there should be no more delay" (Revelation 10:5,6).

The "everlasting gospel", preached by the angel flying through the heavens as he warns that the hour of judgment is about to come, exhorts men to "worship Him that made heaven and earth, and the sea, and the fountains of waters" (Revelation 14:8).

The witness of believers on earth to the truth of creation thus is multiplied and energized by the same witness in the heavenly places, especially as the consummation of all things draws near. That creationists can witness confidently and assuredly for creationism is brought out clearly in this issue of the C. R. S. *Quarterly*. From these

articles alone we are able to witness more objectively about the nature of evolutionary thought, in spite of so-called horse evidences, and especially because evolutionary thought violates the basic scientific laws of the First and Second Laws of Thermodynamics.

Of course, we must advocate creationism for many reasons:—in the name of true science as

opposed to pseudo-science, in the name of academic freedom, in the name of true order and morality among men and nations, in the name of human individuality and liberty instead of an atheistic totalitarianism. But first of all we must proclaim creation in the name of “the everlasting God, the Lord, the Creator of the ends of the earth” (Isaiah 40:28).

RESEARCH REPORT, 1970-71

In these days of research cutbacks it is heartening to report increased, rather than decreased, research activity for the Creation Research Society this past year. Both the number and the quality of research projects supported by the Society and administered by the Research Committee have increased significantly.

A new project initiated late in 1970 by Dr. George Mulfingher has already produced interesting results which strongly support the creationist position. This project involves growing stalactites under laboratory conditions, determining the precise rate of growth and the factors which determine it. Although it is generally claimed that 130 to 150 years are required for the formation of 1 cubic inch of stalactite material, there have been indications that several inches can be formed in one year if conditions are right.

Published results [*C. R. S. Quarterly*, 3(1):38] of the interesting and important project concerning the microflora in sedimentary rocks of the Grand Canyon are being confirmed and extended by Dr. Clifford Burdick and his collaborators.

Stuart E. Nevins is investigator on a recently-approved project concerning the “Capitan Reef” in Texas and New Mexico. The occurrence of fossil “reefs” is difficult to reconcile with Biblical chronology because of the slow rate of formation of modern reefs. There is some indication that such deposits are not true reefs. Mr. Nevins’ research on the “Capitan Reef,” the classical example of a fossil “barrier reef,” will cover the formation, ecology, and geometry of the deposit to determine if it was formed as such by growth of organisms, or if organisms were transported and deposited in a new place.

It is expected that on completion of these projects detailed reports will be published in the *C. R. S. Quarterly*.

Not surprisingly, there are many more potential research projects than investigators willing to carry them out. A representative list published a year ago (*C. R. S. Quarterly*, 1970, p. 88) stimulated subsequent suggestion of several projects. We would like to see a corresponding increase in projects undertaken, not just suggested.

Potential researchers are reminded that the Society maintains a modest Research Fund to support creation-oriented projects when no other source of funds is available. Research proposals involving such requests for support should be submitted to the Research Committee Chairman, and should include a proposed itemized budget accounting for expenditure of the requested funds. Only experimental research is considered; literature research is not funded.

As yet the increase in research activity has not been accompanied by a corresponding increase in donations to the Society to support this research. Successful continuance of the research program depends upon increased income for this purpose. Contributions, which will be tax deductible, should be sent to Professor Richard G. Korthals, Treasurer, 2678 Page Avenue, Ann Arbor, Michigan 48104. Mark your gift for the “Research Fund.”

LARRY G. BUTLER, Ph.D.
Chairman, Research Committee
315 N. Chauncey
West Lafayette, Indiana 47906

A NOTE ON THE UNSATISFACTORY NATURE OF THE HORSE SERIES OF FOSSILS AS EVIDENCE FOR EVOLUTION*

FRANK W. COUSINS**

Professor H. Nilsson assembled powerful arguments concerning the artificial character of the so-called "family tree" of horse evolution. Nilsson's statements have been translated, discussed, and illustrated in this article. On close analysis, the collection of "horse" remains is not a continuum of well-integrated fossils but an assemblage of separate groups varying widely in size and other criteria. **Hyracotherium** (**Eohippus**), for example, was very likely not a horse but an animal quite like the contemporary **Hyrax** or **Damans**. **Mesohippus** and **Parahippus** remains represent a separate group that is not related to **Hyracotherium** or to **Equus**, the modern horse. The "family tree" of the horse is artificial because it has been constructed of non-equivalent parts which are unrelated. Evidence since Nilsson's study is also reviewed. It is concluded that the horse family is unique and separate and that the evidence can, without any, weighting, be fitted to the case for special creation.

Introduction

Construction of family trees to show possible connecting links between various species and larger groups of the animal kingdom is widely used in the presentation of the case for evolution. It is a particularly subtle form of presentation, since it is often assumed by the reader that the drawing itself is evidence for the connecting links which the drawing forcefully suggests (See Figure 1).

Two recent cases† come readily to mind in which, with absolutely *no evidence* to support their case, bodies of learned men have spent prodigious labor simply to show that a paleobiological tree may be drawn for their chosen group of animals. This of itself is not objectionable, but the unwary are easily ensnared intellectually by the erudition of the case to believing that such was *in fact* the way the development of that group of animals proceeded *in nature*—indeed the case is inevitably concluded in that manner by the authors of the scheme.

If one now turns to, allegedly, the most power-

ful evidence in support of the case for evolution (i.e. transformation across the species), one will often be invited to consider the case for the alleged evolution of the horse. That this is indeed so, I quote from a recent paper by Professor F. H. T. Rhodes¹

at a lower taxonomic level, between genera, for example, we also have a substantial number of transitional sequences. One of the best of all is the sequence of horses linking the whippet-sized, primitive, Eocene form *Hyracotherium* with the living horse. This was one of the first fossil sequences ever described. It was first described by Kovalevsky in 1874, and it was later amplified by Marsh, and interpreted by Huxley. The beautiful gradational sequence which these fossils show is now so well described (e.g. Simpson*, 1951) that we need only summarise its major features. These involved the increase in body size, the increase in size and change in the shape of the skull, changes in the teeth, involving the premolarisation of the molars, and the deepening of the teeth from low crowned to high crowned, together with the infilling of the depressions in the upper surfaces with cement. With these were associated changes in the limbs, with the gradual reduction in the number of toes, and in the whole change in construction of the limbs associated with the change in posture from pad-footed to spring-footed. Now this series is incontestable. It provides clear evidence of the transition of one genus to another over a period of something like seventy million years.

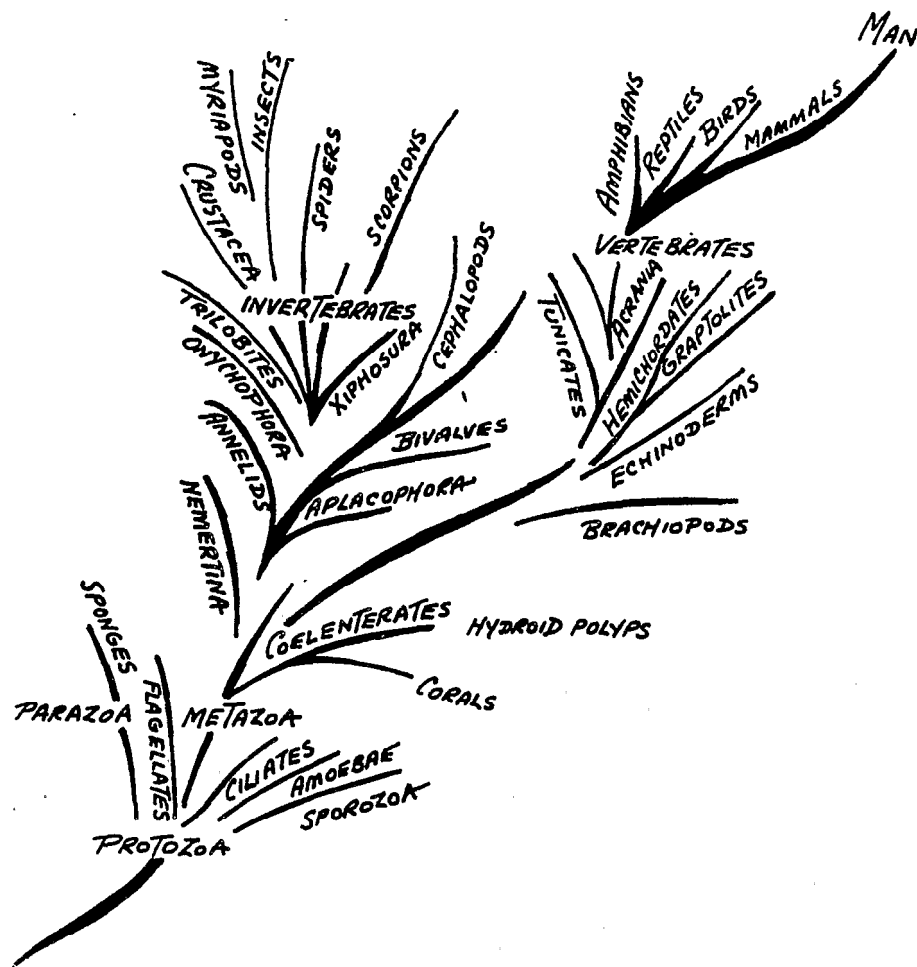
Secondly, at all taxonomic levels, there are now, in a limited number of cases, examples of continuity. Let us first of all take high taxonomic levels. Here we have, especially in the vertebrates, remarkable transitional

*Editor's Note: This article is based on a chapter in the forthcoming book entitled, *Symposium on Creation*, III, and is reprinted here by the kind permission of the editor, Mr. Donald W. Patten and the publisher, Baker Book House, Grand Rapids, Michigan. *Symposium on Creation*, III is scheduled to appear in August or September, 1971, as the third in a continuing series of such symposia dealing with selected creation topics. Volume III will contain the following essays: "Theories About Life and Its Origin" by J. Hewitt Tier; "The Alleged Evolution of the Horse," by Frank W. Cousins; "The Alleged Evolution of Birds (*Archaeopteryx*)," by Frank W. Cousins; "Stratigraphic Evidence of the Flood," by Stewart E. Nevins; "The Scopes Trial," by Bolton Davidheiser; "Fossil Man," by R. Daniel Shaw; and "The Cell," by David Tilney.

**Frank W. Cousins is a consulting engineer, a chartered electrical engineer, and a fellow of the Royal Astronomical Society.

†"Genesis of the Hymenoptera and the Phases of their Evolution," S. I. Malyshev London 1969 (63/-) "The Cnidaria and their Evolution." Symposia of the Zoological Society, London, No. 16. Edited by W. J. Rees. London, 1968. (1051/-).

*Simpson, G. G., (1951), *Horses*, Oxford University Press, New York.



ANIMAL PHYLOGENY,
after de Beer

Figure 1. From "Fossil Man, a Reappraisal of the Evidence," by F. W. Cousins, 1961, published by The Evolution Protest Movement, Havant, Hampshire, England.

This phylogenetic tree is typical of the way evolutionists present their case. It is redrawn by the author from deBeer's *Atlas of Evolution*, Nelson, 1964, p. 155. In presenting it deBeer says: "Animals evolved from Protophyta by loss of chlorophyll and acquisition of holozoic nutrition. From Protozoa, Parazoa produced sponges, and Metazoa gave rise to two main groups leading to the highest invertebrates and to vertebrates respectively." There is no evidence of such an evolutionary chain. There is no evidence at the outset of the chain that a single protozoan has changed into a single metazoan¹. The author found no difficulty in drawing this phylogenetic tree, but the lines, the slope of the lines, the thickness of the lines, the graceful upward curve of the lines should not be mistaken for evidence of actual genealogical links. (from Heywood, V. H., and McNeill, J. Phenetic and Phylogenetic Classification. *Nature*, Vol. 203, No. 4951, pp. 1220-1224, Sept. 19, 1964)

forms between various classes. Between the crossopterygian fish and the amphibia, we have the ichthyostegids, part fish, part amphibia, known from the Upper Devonian or Lower Mississippian of Greenland. The early Upper Devonian Elpistostege is intermediate between ichthyostegids and osteolepids (Westoll, 1938, 1943, 1958). Between birds and reptiles, we have the renowned Archaeopteryx.

and from Dr. G. A. Kerkut's book,²

It would not be fitting in discussing the implications of Evolution to leave the evolution of the horse out of the discussion. The evolution of the horse provides one of the keystones in the teaching of evolutionary doctrine, though the actual story depends to a large extent upon who is telling it and when the story is being told.

I will now proceed to show that the evolution-

ists' view concerning the horse as valid evidence for transformation is open to serious doubt. I hope to show further that the general presentation of their arguments cannot carry the conviction which is universally granted to it by those unskilled in biology, who, not unnaturally, accept that biologists view the evidence with dispassion, as far as that is even possible, in the presentation of the controversial case which they espouse.

I turn to the powerful arguments mounted by the late Professor H. Nilsson in his *Synthetische Artbildung*³. Unfortunately, this encyclopaedic work is expensive and rare; further, it is written in the German language and thereby not openly accessible to readers who are not German

scholars. I am much indebted therefore to my friend, Mr. C. H. Greenstreet, for having made, at my request, a translation of the relevant portion of *Synthetische Artbildung*, on the horse which it is my pleasure to present for the first time in English. I am also indebted to the kindness of the publishers of *Synthetische Artbildung*, Messrs. C. W. K. Gleerup of Öresundsvägen, Lund (Sweden), for permission to publish this translation and thereby give these important ideas to a wider audience. The pictures, footnotes, the introduction, conclusion, and the extensive bibliography presented here are my contribution to this study and they form no part of the original pieces by Professor Nilsson.

* * *

The Horse

How innumerable are the family trees that only hold together because "connecting lines on paper" form the intermediate bridges! Without these, the construction of a family tree would be almost impossible. For it is particularly the connecting corners that in reality are almost always lacking. One can easily satisfy oneself of this everywhere in the relevant literature.

Here someone interrupts: "But no! even if all the other family trees are demolished, *one* nevertheless remains, paleobiologically sound, continuously and consequentially constructed, established through the whole Cenozoic", the family tree of the horse."⁴

It is true that people have spoken of the evolutionary "parade horse," proudly calling attention on the one hand to the completeness of a long transformational series, while on the other hand contemptuously emphasizing the nature of the series as a rather detached piece of bravura.

The enthusiasts are many. One can still see in the latest reviews of evolution, which are no longer written by natural philosophers or pure morphologists, how the family tree of the horse is compared to a true *experimentum crucis*. It is set out thus in the book *The Cause of Evolution* by the geneticist and biostatistician J. B. S. Haldane⁴ (and in the recent *Atlas of Evolution* by the pre-eminent Darwinian, Sir Gavin deBeer⁵, see Figure 2).

We must at all events look somewhat more closely to see how deeply the credibility of their evolutionary series is anchored, despite the fact that the biostatistician readily accepts it. For it is

certainly clear that neither the number of the forms nor the possibility of arranging them in a series is proof on its own.

It is very instructive to remind oneself how the oldest, Eocene fossils of this series were first interpreted. Davies⁶ gives a good survey of this. He is so far from entertaining anti-evolutionary thoughts that he wrote his book rather as a polemic against the real English critic with respect to the theory of evolution, Dewar⁷.

Owens, the discoverer of the first eozioc* fossil in the London clay, explained the skull fragment as a new ungulate genus, which he named *Hyracotherium*. The name refers to the Genus *Hyrax*, the "Klippschliefer" or "Daman"^{**}, which is today native to the mountains of Africa and Western Asia. Owen did not want to assert that *Hyracotherium* resembles the "Klippschliefer" more than any other genus of pachyderm, only that the size of the animal appeared to come closest to that genus. Its binary name was *Hyracotherium leporinum*: by the specific name he wanted to call attention to certain features of the skull that seemed to him to resemble the rodents. When later he was able to describe an almost complete skull and parts of the limbs, he did not dare to identify the two forms, but named the new form *Pholophus vuliapeps*, that is to say a type with a fox's head but multiple back teeth as in the hoofed animals. This form has been included by the later paleontologists in the genus *Hyracotherium*.

As will be at once seen from this state of affairs, Owen found an indication of correspondence of

*Cenozoic—the age of the mammals, said to extend from about 60 million years to the present.

**The idea of evolution in the Horse began with Kowalewskii working with European and Asian forms; see Kowalewskii, V. D. (1842), "Sur l'Amchiterium aurielianeuse et sur l'histoire paleontologique des Chevaux," Mem. Acad. Imp. Sci. St. Pet. 7, Vol. 20.

*Eozoic—a term suggested for the Pre-Cambrian system, but little used. It means the "dawn of life."

**Daman—from the Arabic name *Daman isroil*, sheep or lamb of Israel (It has no resemblance to a sheep). The Syrian rock-badger or "cony" of Scripture (*Hyrax syriacus*) is the name also extended to the species found at the Cape, *Hyrax capensis*, (the Saphan of the Scriptures).



Figure 2. The evolution of the horse according to deBeer, *Atlas of Evolution*, 1964.

characteristics of *Hyracotherium* with several orders, including that of the ungulates. But he made no mention of a relationship with the equids.

When, toward the end of the nineteenth century, still further finds of *Hyracotherium* - like fossils had been made, it was found that these approached other forms, including the tapirs and rhinoceroses. The Eozoic hoofed animals of the perissodactyl* type were therefore collected into one family, Lophiodontidae.**

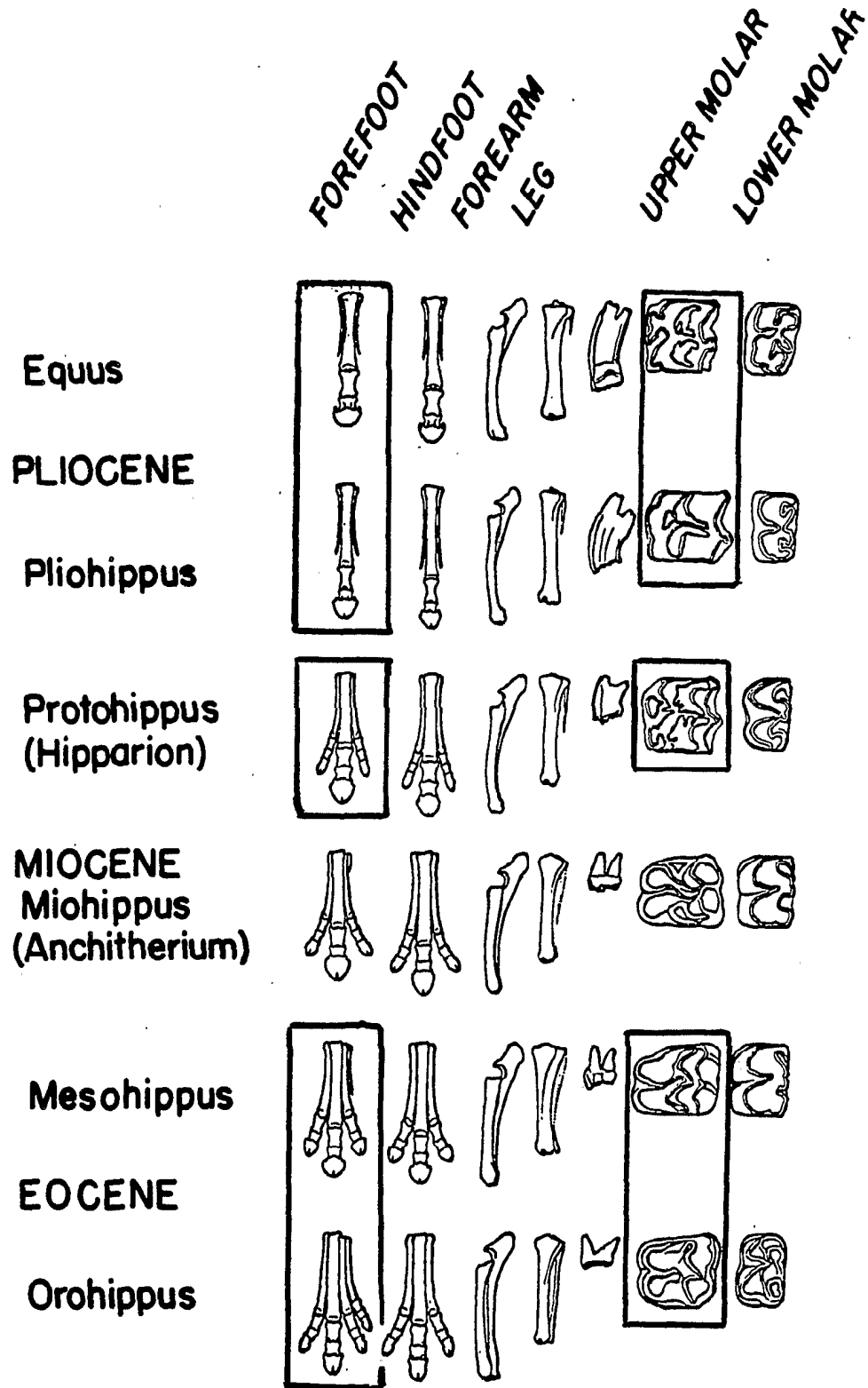
Very early on, however, already in the middle of the seventieth year of the previous century,

*Perissodactyla Odd-Toed Ungulates—an order of mammals containing Horses, tapirs, and rhinoceros.

**Lophiodon—a fossil mammal of the Eocene Period related to the tapirs.

the roots of a family tree of the present day horse were produced from this material. The finds of the American paleontologist Marsh and others were schematically exhibited for a lecture given by Thomas H. Huxley in New York, where there were seen in increasing order and in series the front and back feet, the forearms, the rear leg bone, the tooth types, and the surfaces of the back teeth. (The author has reproduced the picture in Figure 3.) From this work the ancestry of the horse was at once complete. It was published by Marsh in 1879 and then found quick entry into many publications and text books; indeed it is still seen today, in full or in part, almost unchanged.

Since the, more than 70 years have passed and a quantity of further finds have been made



ALLEGED GENEALOGY OF THE HORSE

Figure 3. Alleged genealogy of the horse (after Marsh, Polydactyl horses, *American Journal of Science*, 1879, p. 505).
The parts in the black boxes are the parts used by deBeer to make his case in 1964. See Figure 2.

The continuity of the series has in certain cases become more intimate. Osborn, the outstanding expert on fossil horses, which have so greatly increased in number, thus also gained so strong an impression of the gradual transitions that he regarded the whole process of "becoming horse" as a displacement of the proportions of characteristics, as a pure case of transformism in the Darwinian sense. After discussion of the horse series he summarized his opinion in the following characteristic statement (Osborn⁹, p. 268):

The above examples illustrate the general fact that *change of proportion* make up the larger part of mammalian evolution and adaptation. The gain and loss of parts, which is so conspicuous a phenomenon in heredity as studied from the Mendelian standpoint, is a comparatively rare phenomenon. The changes of proportion are brought about through the greater or less velocity of single characters and of groups of characters; for example, the transformation of the four-toed horse of the base of the lower Eocene into the three-toed embryo of the modern horse is brought about by the acceleration of the central digit and the retardation of the side digits. This process is so gradual that it required 1,000,000 years to accomplish the reduction of the fifth digit, which left the originally tetradactyl horse in the tridactyl stage; and it has required 2,000,000 years more to complete the retardation of the second and fourth digits, which are still retained in the chromatin and develop side by side with the third digit for many months during the early intra-uterine life of the horse.

According to Osborn the little toe also required 1,000,000 years to be continuously reduced away. He reckoned, however, with only 3,000,000 years for the whole Cenozoic Period. Now this period is estimated to be at least 30,000,000 years.* The reduction of a given toe thus required 10,000,000.** The thought is not a little ingenuous.†

*It has increased twofold from c. 1930. It is now 60,000,000 years not 30,000,000. The argument of Nilsson is thereby greatly reinforced.

**This figure would now be 20,000,000 years.

†Editor's Note: It is obvious to the reader that Nilsson placed some faith in the supposed vast ages of the uniformitarian geologic column, as did Douglas Dewar and certain other creationists of a previous generation. Creation Research Society stands unalterably opposed to the long-ages hypothesis and in favor of a relatively recent creation (although not necessarily 4004 B.C.). Yet it is of interest, as author Frank Cousins points out, that the evidence favoring the creation of horses is so clear that it cannot be denied whatever one holds about the so-called "science" of stratigraphy or the supposed vast epochs of geologic time. For numerous papers concerning evidence from many fields favoring a "relatively young earth," consult previous issues of C. R. S.

If one asks oneself: Is the continuity then really so marked as the series of *Hippi* (the names too are continuous) set up as long ago as 1879 indicate?

We ask the best European expert on fossil horses, Abel¹⁰, who is also familiar with the American finds. In his *Palaeobiology and Family History* which is thus 50 years more recent than Marsh's treatise, the horse problem is dealt with from the modern point of view, so that the work can be said to be representative of the present position of the relevant research.

In Figure 4 I have represented the family tree of the equids, after page 288 of Abel, in a comprehensive scheme, to which are added the geological stages and formations for both Europe and North America. As one sees, a hypothetical family tree is also made very prominent here. Many forms have been added, but they branch off from the main stem and disappear. Here too everything seems to proceed in unbroken and undisturbed temporal series. A parade horse in truth steps forward, perfect, out of the darkness.

However, when one carefully studies Abel's portrayal of the genesis of the horse, one is not a little surprised at several comments.

Attention is still drawn, as before, to the complete continuity of the family tree of *Equus*, so that one at once gets the impression that the development has proceeded quite undisturbed. In this case one does not expect discontinuities, either biological or geological. However, Abel speaks of "Old horses" and "New horses." The latter further form two clearly independent groups: that of small and more primitive new horses and that of the large equus-like. The last group begins with *Merychippus*. And the appearance of this genus is depicted as follows:

However, the horse series itself shows very clearly that the phylogenetic development of a tightly-closed stem took place in quiet, uniform, one can say always uniform forms, and that then, in the series mentioned here, which it is true does not include all genera of the North-American horse, an era of much faster transformation set in that appeared almost stormy. This era is characterized by the origin of the *Merychippus* type¹⁰.

And in another place he asserted that at the same time as in North America there occurred the formation from *Merychippus* of numerous new stems occurred in almost explosive form (Middle and upper miocene), there also took place in the case of the whales the origin of the two families of the phaseritides and the ziphuds¹⁰.

Quarterly — articles by Clifford Burdick, Henry Morris, Walter Lammerts, Thomas Barnes, Robert Whitelaw, Melvin Cook, R. H. Brown, and many others.

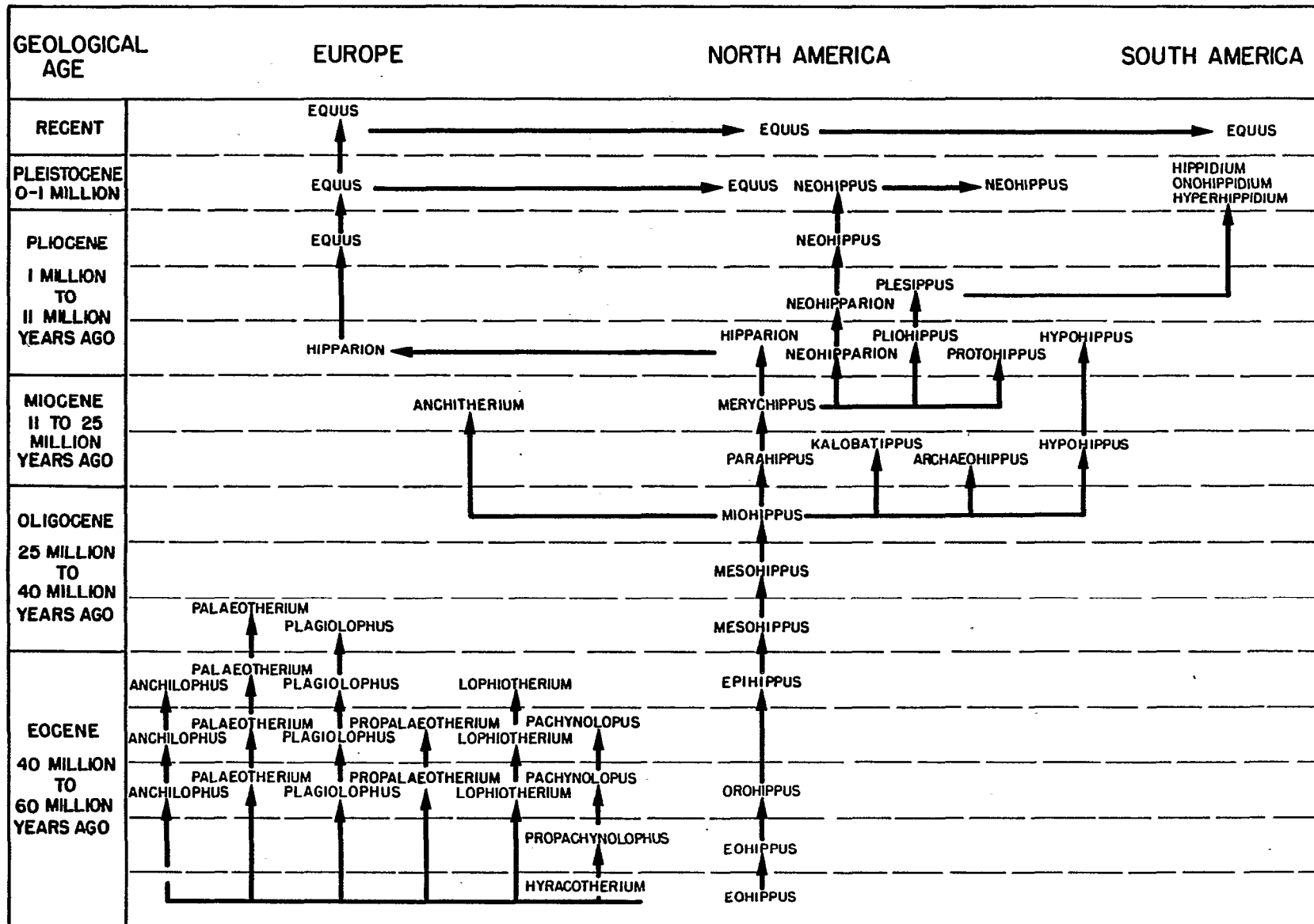


Figure 4. The family history of horses, after O. Abel. (Slightly simplified)

A "stormy," "explosive" transformation of the horse tree, we can thus also say an emicative process, thus took place during the latter half of the Miocene. This applies both with regard to the degree of change in character and the production of new forms. "I have the impression," Abel¹⁰ also said, "that the biggest jump shown by the horse, apart from the gap between *Mesohippus* and *Epihippus*, lies in the formation of the *Mercychippus*."

The last statement also refers to a new break in the skeleton of the tree. I have just mentioned that Abel distinguished between old and new horses. *Epihippus* is the last of the old horses, while *Mesohippus* is the first of the new horses. Between these we have a very considerable jump. For the first were small animals, only as big as foxes, with four-toed forefeet; only with the latter did the large, three-toed type first occur.

Abel's attempt to reconstruct the biology and environment of these obviously very peculiar and very little horse-like "old horses" is of very great interest. This brings us back to Owen's *Hyracotherium*. This European genus is named *Eohippus* in North America. For their being synonymous Davies put forward the following argument, which is certainly worth reading:

I here assume the generic identity of the *Hyracotherium* with *Eohippus*, as seems the inevitable conclusion from Forster Cooper's recent revision of the English fossils (1932). Technically, this means that the name *Eohippus* must be abandoned in favour of the prior name *Hyracotherium*; but in writing for the general reader I feel justified in using the highly appropriate name *Eohippus* (dawn horse), instead of the misleading *Hyracotherium*¹¹.

Davies is thus inclined to suspend the priority rule of nomenclature, at least for the layman so as not to shake their evolutionary convictions by a misleading name for the proposed starting forms of the family tree.

Perhaps, however, the basis of Davies' rejection of the name *Hyracotherium* is not only the avoidance of a false etymological meaning. Indeed the first supposed ancestors are, as mentioned above, very little horselike both morphologically and in habitat. This was just as little the case with regard to their manner of life and whole ecological situation, as Abel, with the support of several investigators, imagined these to be. He depicted *Hyracotherium* and its environment very vigorously in the following manner:

The oldest horses were not steppe-dwellers, but were small animals, which in looks and in their whole outward appearance must have presented the picture much more of a

Chilean (Puduhirsch) deer or a Javanese deer (*Kantschils tragulus*) than that of a dwarf recent horse. Matthew has drawn attention to the fact that these oldest horses were thicket-dwellers, which rescued themselves in the case of urgent danger not by speedy flight but by a jump into the protective thickets, and which mainly lived on soft leaves and succulent vegetables, and this view is thoroughly to be endorsed. Prolonged running on hard steppes and browsing on the hard grassy plants of the steppes would not have been possible for these little old horses¹².

Why have these eocene animals become true horses, since they remind one so little both morphologically and biologically of horses? Are there today no animals that both look and live like these? Yes. It seems to me quite odd that no one has thought of the genus of animals from which the current name of Owens, *Hyracotherium*, was formed, namely *Hyrax*. It already shows in its incomplete material hyracoid traits, but no equine ones. And the former have become progressively more striking as the type has been made more complete through new finds.

Hyrax is a quite remarkable animal in the present-day fauna, which fits into no order since it imitates many orders. Mostly it is placed in the genus of hoofed animals, but it has also been placed amongst the insectivores and the rats; indeed, people have also sought to find traits of the elephants, marsupials and edentates.* The truth is that we find here just as peculiar a recent combination form as the South American hoatzin was among the now living birds. Owen has already found *exactly the same* with regard to *Hyracotherium*.

Hyrax, like *Hyracotherium*, is a small animal, about the size of a rabbit or fox. Like these, *Hyrax* has four toes on the fore-limbs and three on the hind limbs, a quite striking similarity. The back teeth of the two genera exhibit many similarities and resemble those of the rhinoceri more than those of the horse. It must be added that *Hyrax* is a very shy animal that usually lives on mountain ledges and in thickets of the highlands, and when it chances to come out of the edges of the woodlands into grassy plains it takes fright extraordinarily easily and quickly disappears back into the thickets. Its way of life and name thus remind one as exactly as possible of those postulated for *Hyracotherium*.

Thus *Hyracotherium* does not resemble the present day horse in any respect, but on the other hand is quite *amazingly similar* to the present

*Edentata—An order of mammalia characterized by the absence of front teeth, (the ant eater, armadillo, sloth, etc.).

day damans. One can also express this state of affairs by saying that *Eocene "horses" are still living today*. Naturally these cannot be regarded as horses, for this would mean that evolution is standing quite still. Since the rest fit into none of the recent orders, one speaks of them, to save ridicule, as little as possible. They would in fact only fit into the Eocene order *Lophiodontidae*, but this would be too absurd.

Hyracotherium is an Eocene genus. Beside it several closely connected European genera are placed and, as is seen from Figure 4, the genera *Propachynolophus* and *Pachynolophus* follow in the middle and upper Eocene, while *Hyracotherium* disappears in the lower Eocene. Thus a beautiful transgressive development appears to take place here. A revision of the European old horses by Forster Cooper¹³ has, however, shown that those genera cannot be distinguished. Thus *Hyracotherium* lived during the whole Eocene and the development stood still. The names alone appear to have developed.

One still meets with the opinion that the horses became successively bigger. This is of course correct insofar as *Equus* is bigger than *Hyracotherium*, just as the horse of the present-day fauna is bigger than the daman, and between the two extremes there are in both cases several intermediate forms of ungulates. Now people were so firmly convinced of the increase in the size of horses in the geological strata that in some cases the ages of the strata have even been determined by the size-type of the horse-remains found therein.* As Cooper pointed out, there is no strong parallelism in this respect. *Eohippus* which appeared in the lowest Eocene, is the largest form of the Eocene horses. All middle and upper-Eocene forms are smaller. Only in the Oligocene did there come, with *Mesohippus*, a sudden significant increase in size. Here there appeared a type of horse that was also changed in many respects: a type of small new horse, which is about as big as a sheep.

With this there comes to light the first lacuna in the hypothetical family tree of our horse. In these animals of genera *Mesohippus* and *Parahippus*, both the front and hind feet are three-toed, and they differ from the old horses in many other characteristics, into which we cannot go here. Their way of life was also new. Thus Abel¹⁴ thought that they were steppe-animals which inhabited flood-plains formed during the Oligocene. A type both morphologically and biologically new occurred with the Oligocene and lived until the lower miocene. Then this too disappeared.

Thereafter the real horse, the new horse, first appeared. The breaking of a hypothetical evolu-

tion series can hardly be more definite than with the appearance of this type. One-toedness dominated, although quite clear rudiments of two side-toes may occur. But an important deviant type occurred with respect to the teeth and the nature of the dentition. The teeth of the horse are very high, prismatic, not rooted, (?enamel-folded) and richly covered in cement. In this respect they are structures unique in the whole fauna. Animals with teeth first occur in the upper Miocene. These "hypsodontal ungulates" appear all at once, without intermediate stages. They are even naturally variable, just like other groups, since they at once appeared in full bloom. With *Merychippus* and *Hipparion* there is a rich group of Equus-like forms which are all separated from the former "brachydontal" groups, by a gaping evolutionary gap. These former groups have died out, totally eliminated from the search. Here one cannot speak of evolution. The complete extinction of an ungulate fauna and the sudden appearance of another—and this at once richly differentiated, which I have described above as an emicative occurrence—is rather a creative fact.

The family tree of the horse is beautiful and continuous only in the textbooks. In the reality provided by the results of research it is put together from three parts, of which only the last can be described as including horses. The forms of the first part are just as much little horses as the present-day damans are horses. *The construction of the whole Cenozoic family tree of the horse is therefore a very artificial one, since it is put together from non-equivalent parts, and cannot therefore be a continuous transformation series.* Its evolutionary value is therefore made totally untenable through the new research.

* * * * *

Conclusion

Since Nilsson's work on the horse, reported here, there is no new evidence known to me which leads me to wish to change the conclusions he reached. His work was closed before 1954, but Dr. G. A. Kerkut of the Department of Physiology and Biochemistry at the University of Southampton, writing in 1960, and reprinting his researches in 1965 (See reference 2) appeals forcefully for biologists to put their house in order regarding the basic information on the horse and the fossils *per se*.

He points out that the basic information on the known fossils has not been given since 1926 and 1930 and that it is difficult to find out how many specimens of a given genus are available for study. There are, he thinks, probably 100 mounted skeletons of fossil horses in the world. There are no mounted skeletons of *Eohippus*,

*This is a good example of the circular reasoning of the "science" of stratigraphy.

Archaeohippus, *Megahippus*, *Stylohipparion*, *Nannippus*, *Calippus*, *Onohippidium* or *Parahippies* and none in the USA of *Anchitherium* or *Hipparion*.

He then draws attention to the genera of the horse family. Kowalewski in 1874 knew of three; Lull in 1917 described 15, Simpson listed 26 in 1945, and Kerkut wonders how valid these genera really are. The Eocene is now dated at 60 million years and no one yet knows how to place the alleged 26 genera in relation to themselves within this vast time period which is open to severe criticisms on the dating methods used.

We still have a few of the Przewalski horse extant. The Prague Zoo keep the records of this animal believed to be the horse pictured in the Lascaux Caves (15,000 years ago?). A herd of eight was sighted in Mongolia in 1966. Dr. R. M. Stecher in a paper in 1968 in *Acta Zoologica et Pathologica* gives results of vertebrate counts from the spines of 61 skeletons of the Przewalski horse and he compares these with similar counts from four other horses—the domestic horse, donkey (*E. asinus*), mule (*E. caballus* and *E. asinus*) and hemione (*E. hemionus*). He also attempts to relate these figures to the number of pairs of chromosomes in a cell of each horse.

Przewalski horses have the longest thoracic segment in the spine, the next to the longest lumbar segment, the shortest sacral segment, and the next to the smallest number of lateral joints in the lumbar spine. It has also the highest chromosome count—66 pairs against 64 of the domestic horse, 63 of the mule, 62 of the donkey, and 54 in the hemione.

Dr. Stecher then makes the *completely invalid* assumption that this suggests evolution within the horse since the horse spine has changed and these changes are correlated with the chromosome count. It suggests, to my mind, nothing

of the kind; it shows conclusively that the spines and chromosome counts are different in different animals and absolutely no evolutionary argument can legitimately be imported into his researches. He should know that we classify everything by constitutional differences and a study of the morphology of the horse cannot be used to decide on the reasons for the constitutional differences.

Horse evolution in 1969 is still a matter of conjecture and not based on clear and unassailable evidence. The horse family is unique and separate and the evidence can, without any weighting, be fitted to the case for special creation.

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THE SCIENTIFIC CHARACTER OF THE EVOLUTION DOCTRINE

WILLEM J. OUWENEEL*

It is becoming increasingly apparent that evolutionism is not even a good scientific theory. For example, evolutionists assert that life arose naturally from non-living matter and yet no evidence exists favoring "spontaneous generation." The creationist explanation at this point is simpler and also more adequate.

Evolutionism is shown to be neither a theory nor an hypothesis but a dogma or doctrine. It does not legitimately fall under the heading of "natural science" but fits within the domain of philosophy because it is a materialistic postulate.

On six accounts evolution theory is shown to fall short of what should be required in any truly "scientific" postulate or conception. Finally, although neither creationism nor evolutionism is strictly a "scientific" concept, creationism should be favored because it is more consistent with our knowledge and is at the same time rooted in the word of God.

Origins and Scientific Facts

In the former century when the views of Darwin conquered the scientific world, they unquestionably had some merit by giving rise to an extensive inquiry into the variability of living organisms, and into concrete evidence for variation.

It is to be regretted, however, that many biologists became so enthusiastic for the theory that they went much further than the concrete body of facts. They connected these facts with a materialistic philosophy, ranging far beyond the purely scientific horizon. In this way the evolutionistic views grew to become an all-encompassing doctrine.

But we would be greatly in error to call such a doctrine a scientific theory. Any "scientific" theory ought to be based on scientific facts, not on speculation. It is hardly believable that for instance Grassé¹ can write: "Les biologistes . . . sont profondément convaincus que l'évolution est un *fait* indiscutable" (The biologists are profoundly convinced that evolution is an indisputable *fact*).

Evolution in the broad sense (i.e., the descent of all living organisms from common ancestors, and these from the inorganic world) is not an established fact at all, not even a conception based on facts. It is a conception based on materialistic philosophic views, opposed to the older creationistic views, but per definition not more "scientific" than these.

Every textbook author that tries to prove the evolution doctrine supplies a large number of facts which all pertain to variation (i.e., change within the Biblical "kind"), but never prove the transformability of the "kind." These real facts of variation are heartily accepted by the creationist who reserves to himself, however, the right not to extrapolate these facts in an evolu-

tionistic way, but to interpret them in a Biblical way.

It is quite understandable that for many scientists the materialistic view of evolution may seem much more logical and acceptable. A particular scientist may shrink from introducing a "deus ex machina" in his scientific field, but this essentially has nothing to do with the question of which view is correct. "Truth" lies beyond the horizon of natural sciences, on the theological level, and is known by revelation only, not by investigation.

It is therefore incorrect to accuse those who believe in creation as explaining these scientific facts, of being "unscientific." With the same token one can argue that those are "unscientific" who accept scientific facts but also believe in evolution which is not a scientific fact. Evolutionism comprises both the explanation of certain phenomena (repeatable processes), and the description of historical processes (not repeatable but documented). Both of these elements can be accepted as "facts" only if the postulated "repeatable processes" have been observed or experimentally reproduced, and only if the supposedly historical events have been sufficiently documented. On both accounts the evolutionists have completely failed whereas the creationists find confirmation of their views in many scientific respects, as we will see.

Nevertheless most scientists firmly believe in macro-evolution if for no other reason than that they repudiate the creationistic alternative and overestimate the value of the natural-scientific method. One of the foundations of this method is the principal unity of all that varies. Accordingly, when fossils point to variability this must be understood as "consanguinity," otherwise the possibility of a natural-scientific explanation would have to be given up (Van Melsex²). I feel this is a gross over-estimation, because we are not interested ultimately in the most elegant method of thinking but in the truth. Thus it is just as possible that the unity of the organisms should be understood as due to a common creative de-

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sign and Designer. This is in itself an “elegant” mode of thought,

Therefore I first will compare, as objectively as possible, the creationistic and the evolutionistic approach as “scientific” methods from the theoretical point of view, and then try to show that even for the scientist who does not know the Word of God, and is not prejudiced by materialism either, it ought to be evident that the evolution doctrine, though being an interesting philosophy, does not fulfill any of the conditions which a scientific hypothesis reasonably should satisfy.

Origins and Basic Assumptions

One objection against creationists is always that they *a priori* assume the existence of a Creator-God, whereas pure natural science is claimed to have no *a priori* assumptions and to be unprejudiced and objective (Van den Bergh³). But the same scientist admits⁴ that the invariability of natural phenomena is the foundation and *raison d'être* of natural science. But has this invariability been proven irrefutably? No, this is impossible for it is an *a priori* assumption or a premise. It is an axiom of great importance indeed, but still only an assumption.

Moreover, the invariability assumption is not so very self-evident as it seems, because this postulate would in fact exclude the supernatural miracles. Therefore the materialists *a priori* must exclude the existence of God, at least a god who intervenes in nature. This means that both creationism and materialism (c.q. evolutionism) are founded on *a priori* assumptions, viz. either that God exists or that He does not.

Some argue, however, that it is more reasonable to deny the existence of the non-observable than to recognize it. They assert further that, if this premise of the creationists that God exists and that his works are observable in nature, is to have any reason for existence, it should satisfy at least two reasonable demands: (1) a hypothesis must be verifiable, and (2) it should not be more complicated than is necessary for the explanation of the phenomena observed.

When these demands are applied to the premises of creationism it is argued that (a) the existence of God cannot be verified by scientific experiments and no facts can conclusively show that nature is the work of God's hand; (b) it is not necessary to postulate the existence and the activity of a Supreme Being, because all natural phenomena turn out to be explicable in a simple, natural way. Therefore the existence of God should be excluded from our natural-scientific thinking.

Logical as these propositions seem, they are not universally valid. Point (a) for example,

simply indicates the limitation of natural science, for who knows whether the observable reality is the only and complete reality? If this were asserted, it would create a third *a priori* assumption of natural science, not to mention a fourth necessary axiom, that our sense-organs and measuring-methods give a concordant picture of total reality.

Point (b) is indeed a very useful postulate in dealing with objects and processes which can be observed and measured at this point in time. It is different, however, when one must deal with natural phenomena which are *not* observable and which have an exceptional character. The best example of this is the origin of life on earth.

One might argue that this is a problem that does not strictly come into the framework of natural science. That would be then an honest recognition of the limitations of natural science, because the origin of life is indeed such an exceptional and unique phenomenon that it is entirely withdrawn from our observation, whereas observation is supposed to be the foundation of the natural-scientific method.

Conversely, one could argue that the origin of life is a natural phenomenon and that examination of it therefore falls under the heading of “natural science.” But this would place one on the horns of an inevitable dilemma: on the one side one must assume that life has originated from lifeless matter, and on the other one is convinced that “spontaneous generation” does not exist!

This dilemma cannot be solved. Even if a scientist were capable of creating life in the laboratory, he would have shown only how life *might have* originated, but from the natural-philosophic point of view we would not be an inch closer to the question how life originated *in reality*.

Simplicity of Explanation

When one considers the two demands which a hypothesis should satisfy, I would like to ask: (a) which explanation is “simpler” to assume that life has originated by a unique supernatural creative act, or to assume that life has originated by spontaneous generation—a process in which scientists for the most part do not believe?

And (b) how will we ever be able to verify whether life has originated by creation or by spontaneous generation? This problem by definition cannot be solved scientifically. At best one might show how life might have originated. But even so he could do no more than to imitate the environment in which this origination is supposed to have taken place and then to wait (perhaps for centuries) to see whether life would originate therein.

But in reality it is fairly well known that a great technical ability and a high level of intellect would be needed to produce life in a test-tube. If living protoplasm were ever to be synthesized, then natural scientists would simply have amassed more evidence to show that life could have originated only by the activity of a great Intellect.

This section may therefore be concluded by asserting that: (a) the simplest explanation may be the creationistic one, and because of the limitations of natural science a scientist does not have the right or reason to reject this explanation formally. And (b) an explanation of a natural phenomenon can be right although verification within the framework of natural science may be impossible. This shows that creationism covers a larger domain than evolutionism because it investigates beyond the natural into the supernatural—the latter not by imagination but by revelation.

Evolutionary Dogma

Strict attention will now be given to the scientific character of evolutionism. In the title of this paper, evolution is called a "doctrine," and perhaps this is the best way to describe it because it is a dogma which is taught with an appeal to credulity. Delfgaauw⁵ has discussed the problem whether evolutionism may be called a thesis, a hypothesis or a theory.

Evolution cannot be a thesis because a thesis must be proven, but the evolution doctrine is unproven and also unprovable. At best you can cite arguments of probability, but you cannot prove that a supposed historical process which is not documented really has taken place. The supposed consequences of evolution are documented but not the process of evolution itself.

Is the evolution doctrine a hypothesis? A hypothesis serves to correlate certain observed phenomena, and indeed this is also a function of the evolution doctrine. But there is a great difference. In science, hypotheses have only a temporal existence—they disappear as soon as more satisfying hypotheses are found. But the evolution doctrine has no alternative in natural science. Even when a great volume of data is found contradicting this doctrine it is not given up, because the materialists have nothing else. They flatly refuse to look further than their field of vision, and in some respect they are right because it would make them metaphysicists, natural-philosophers, or even theologians.

But when they refuse this, do they have the right then to, look for an explanation which by their own admission evidently cannot be given within the natural-scientific framework? And when they give an explanation, can it possibly be anything else than also a philosophy, albeit a

bad one? Delfgaauw recognizes this in some way. He shows that the evolution doctrine cannot be a hypothesis, because it cannot be replaced by another one. Therefore, it is not a theory either because a theory is a way of thinking (about some field of science) which also should be replaceable by another one, which for the materialist is impossible.

Therefore Delfgaauw concludes that the evolution doctrine is a "postulate," i.e., a demand made on thinking such that if man wants to think about a certain domain of reality, he ought to think according to this demand or ought not to think. This is an honest but all too characteristic view for a materialist; he simply refuses to think in another way than in that of materialism. But materialism is nothing else than a kind of philosophy, and why should one not have the right to accept another philosophy, viz. creationism?

When it is once recognized that evolutionism does not fall strictly under the heading of "natural science," one is apt to recognize many aspects in which evolutionism turns out to be actually unscientific. It has been noted that the evolution doctrine offers no alternative within natural science. Therefore, it is a materialistic postulate. But is it a "*scientific*" postulate? A truly scientific postulate must satisfy these six criteria:

- (1) It must be in accordance with the principal laws of mathematics and natural science.
- (2) It must not be more complicated than necessary for the explanation of the phenomena observed.
- (3) It must give rise to conclusions which can be controlled by further (experimental) observations.
- (4) No data may be known which are principally at variance with the conception.
- (5) It is acceptable only if alternative hypotheses have been shown to be either wrong or less satisfactory.
- (6) Its reliability is inversely proportional to the number of unproven postulates on which it is founded.

How far does the evolution doctrine satisfy these demands? Let us follow them point by point.

(1) *A scientific conception must be in accordance with the principal laws of mathematics and natural science.* Evolution shows a painful lack of coordination between the various fields of the exact sciences. It is a well-known phenomenon that every scientist senses the difficulties in the evolution doctrine on his own field, but he imagines that the doctrine is sufficiently supported by other disciplines. Therefore every biologist should know that the doctrine is at variance with main principles of mathematics, physics, and geology.

Mathematics: In 1966 a symposium of mathematicians and biologists was held⁶ to discuss the statistical incompatibility between the uniqueness and complexity of the gene and a theory of natural selection of random mutations. It seems that the mathematicians did not understand the biologists and *vice versa*. I agree with Salisbury⁷ that only Drs. M. Eden and M. P. Schützenberger really seemed to understand the problem. These two men agreed that the evolutionary origin and development of life was highly improbable!

Physics: The same discrepancy is felt between physics and biology. Physicists discovered as a principal law in the universe the second law of thermodynamics. They assert that in a closed system (i.e. a system in which no exchange of energy with the outer world is possible) the entropy (the inclination to convert kinetic energy into heat) tends to increase. It is known that this law has a universal validity in that it explains the inclination of the universe to a lower level of order and organization. This is evidenced by the "running-down" of the universe and in the break-down of complex stars and of radio-active metals.

This is in striking contrast with another principle (evolution) invented by biologists, which implies an inclination of the universe to a higher level of order and organization. Nobody has satisfactorily solved this discrepancy. It has indeed been objected that the law of entropy is only valid for a closed system while in an open system (as the earth) entropy may temporarily decrease. But first, there can be no reason not to consider the universe as a closed system. Secondly, such a decrease indeed is only temporary and cannot account for a principle of such a general (supposed) validity in the whole universe as evolution.

Bok⁸ tried to solve this problem for the origin of life by assuming that higher organisms have a higher degree of entropy (i.e. a lower energy level) than lower organisms and lifeless matter. In this way he tried to harmonize evolution and entropy by arguing that entropy leads to the origin of larger macromolecules because these have a lower energy level; therefore the origin of life would have been inevitable. But this equates the largest macromolecules with living organisms—a view which lacks all comprehension of the extreme high specificity of living cells.

Only entropy is a leading principle and it involves the disorganization of nature, not evolutionary advance. The uptake and storage of energy is always temporal, and often cyclical (e.g. the ontogeneses and decline of the human body), and ends always in break-down, decay and death. We also observe this in biology: the genetic pool is subject to mutations, but these are nearly always harmful for the organism and lead to a lower viability and fertility. In the

same way cultivated forms always fall back to their original natural state when they are left to themselves. The supposed evolutionary history of man is one great proof of degeneration, not of evolution; the *oldest* human remains known (found in Calaveras and Castenedolo) are entirely similar to present man.

Geology: A third area of discrepancy is known between geology and evolutionism. When Lyell's principle of uniformitarianism is understood only as the general validity of natural laws nothing is wrong. But when it is propagated as in complete contrast with a catastrophic theory (Cuvier), as was intended by Lyell, we should be careful.

It is admitted that all earth strata must have arisen by inundations, and that perhaps every fossil owes its origin to a catastrophe. Under normal conditions no fossils arise. What are the glacial ages other than a kind of cataclysm? Have the mass graves of the mammoths in Siberia, and of the fishes and molluscs in the Alps, arisen under "uniformitarian" conditions? And how can one explain the reversed sequence of earth strata over thousands of square miles (e.g. in Montana, Canada, and elsewhere)?

Uniformitarianism is the fundamental basis of all dating-methods; but is it a sound basis? It is known that the velocity of sedimentation is very different. And as to the radio-active methods, how can one know whether the lead in a rock formation is either all radiogenic or partly primordial? How can it be shown that the cosmic radiation was always uniform? This obviously cannot be true by the evolutionist's own admission because he argues that, for the origin of life, completely different atmospheric conditions were needed than are found at present. Indications of luxuriant polar vegetations in earlier ages point to different atmospheric conditions, while volcanic eruptions are also known to change these conditions considerably. All these changes influence the cosmic radiations and confuse our datings of the rocks.

(2) *A scientific conception must not be more complicated than necessary for the explanation of the phenomena observed.* This demand leads to the many auxiliary hypotheses which have been introduced into geology, taxonomy, genetics, paleontology, etc. to make the evolution doctrine more acceptable.

The geologist has for instance to deal with the following problems: (a) in Montana a reversed sequence of earth strata is found over thousands of square miles without any trace of a cataclysm; how is this explained? (b) Nowhere more than two or three geological "periods" are found above each other. It is claimed that the whole geological column comprises a depth of about 100 miles, whereas the geological strata seldom have a depth of more than half a mile. (c) There is not

a single independent proof that the Devonian, for example, at different places indeed elapsed at the same time. (d) No place on earth shows in strata the evolutionary origin of any animal or plant kind. (e) It has been publicly admitted that the notion of index fossils is based on a circular reasoning: they indicate the age of a rock in which they are found, whereas they themselves are dated by the rock to which they belong. Can all these problems be solved, or is there possibly something wrong with the geological column?

The taxonomist also knows his dilemma. His taxonomical system has become interesting because it would reflect the evolution of living organisms, but at the same time he has to realize that all the organisms in his system are still alive, and he must admit that they have not descended from each other but from supposed common ancestors. Therefore he has to introduce an auxiliary hypothesis to explain why many primitive forms remained more or less unchanged, whereas others underwent a rapid and drastic evolution.

The evolutionary geneticist must evade the following established facts: (a) species turn out to be not transformable; (b) nearly all mutations are harmful; (c) the production of specialized organs and organisms by natural selection of random mutations is statistically unacceptable. The evolutionist can surmount these obstacles for the evolution doctrine only by unproven and unprobable auxiliary hypotheses.

Such hypotheses are also needed by the paleontologist to evade his evolutionary problems, such as (a) why are no intermediate and transitional forms known? (b) why are no nascent organs known? (c) why are the fossils mutually as discontinuous as the present forms? (d) why is there hardly an (if any) fossil in the Precambrian? (although three-fourths of the supposed life history must have elapsed before the Cambrian!) (e) where do the enormous mass graves come from? (f) where do all those Invertebrate phyla in the Cambrian so suddenly come from? What was the origin of the Mammals in the Tertiary? Where did the Angiosperms suddenly come from? (g) How is it possible that species which, according to the theory, are separated by intervals of millions of years as to their period of existence, nevertheless are sometimes found together in one and the same rock (such as supposed impressions of *Homo* and *Dinosaur* in the Paluxy River (Texas), and the Wadjak skulls found by Dubois in the same stratum as *Pithecanthropus*, etc.)?

(3) *A scientific conception must give rise to conclusions which can be controlled by further (experimental) observations.* I now mention other aspects of the experimental approach in which the doctrine has failed. Ecological and crossing

experiments have shown that no variation transcends the borders of the kinds. Mutations may be advantageous in a very specific environment, but they are nearly always degenerative. Selected hybrids after free intrabreeding return to the parental types, cultivated forms to their original state.

A large problem for evolutionists is also that no macromutations with a high selective value have been found. Also mutation occurring in existing genes does not lead to the origination of new genes. Adaptation leads to variation not to transformation. Natural selection tends to eliminate mutations, not to favor them and natural selection with any evolutionary consequences has been observed only where man has drastically created new conditions with a heavy selection pressure.

Spontaneous mutations never can account for the origination of complicated organs or specialized organisms. Moreover, complicated organs are useful only if they are complete and the intermediate forms would be eliminated (nascent organs have never been found). The same mutations arise many times in the history of the species and disappear as often as they arise, making the species oscillate around the wild type. These points are some of the results of the experimental approach but they in no wise confirm the concept of macro-evolution.

(4) *No data may be known which are fundamentally at variance with the conception.* Of course many of the problems summed up in the former sections are contradictions to the evolution doctrine. Many others might be added: (a) The law of recapitulation (saying that the embryological development of an organism recapitulates its phylogeny), once a pillar of the evolution doctrine, has been shown to be nothing else than the deceit of Haeckel. (b) Of all the numerous so-called "vestigial organs" the functions gradually have become known, so that they lose their value as "proofs" for evolution; moreover, if they exist, they can be interpreted as evidence for retrogression (degeneration), not for evolution. (c) The life story of separate species exhibits degeneration, not evolution; Man is the best example, as the oldest forms are similar to present man, but afterwards many degenerative types arose such as the Neanderthaler.

(d) The origination of protozoans or insects before their predators is impossible. In a short time they would have covered every square inch of the earth with a thick layer of organisms. This problem of the natural equilibrium is too often neglected; e.g., the viruses (the simplest "living" forms) could not arise before the higher organisms on which they are parasitic. Consider the many plants and animals which are completely dependent on each other and think of the natural

food cycles and chemical cycles. Then ask, how came this all into being?

(e) Paleobotanics is in fact one great problem for the evolutionist: he sees complex forms often appear earlier than the so-called simpler ones; without a trace of ancestors. He often finds supposed "higher" and "lower" features in one plant. Furthermore, he knows many modern forms which are (nearly) identical with far removed fossil specimens (sometimes even large time gaps are found between so-called related groups). He now finds some of the anatomical features which characterized one particular group to be present also in so-called not-related groups. The whole phylogeny of the Angiosperms in fact is a great mystery⁹.

(f) The supposed evolution of man is contrary to the archeological and historical data. If mankind really is as old as we are told, why has it never before built up a proper civilization? How is it possible that such a civilization very suddenly originated in the Near East only 6000 years ago, and that this civilization since has never become more civilized in fact? The center of civilization has simply moved gradually to the west.

(5) *A scientific conception is only then sufficiently acceptable if alternative hypotheses have been shown to be either wrong or less acceptable.* We could suggest two alternatives for evolutionism, viz. theistic evolutionism ("God has created by means of the process of evolution") and strict creationism. Theistic evolutionism¹⁰ is a poor attempt to reconcile evolutionism with the Bible. Macro-evolution as it is defined is a closed system in which God is not needed.

Theistic evolutionists confuse creation with providence, and they make God the prisoner of the natural processes He created, because these processes elapse of themselves. A strict acceptance of evolutionism makes a belief in God, in sin, and in redemption unnecessary, as Huxley often triumphantly pointed out. Theistic evolutionists have surrendered to this doctrine, seemingly without calculating the consequences.

Only a fundamentalistic creationism can be a serious alternative of evolutionism. But only a few people know that creationists indeed can give equally, or even more, acceptable explanations for many natural phenomena than do evolutionists. In many disciplines so-called "proofs" for evolution have been given. These are generally based on circular reasoning. If one supposes evolution theory is true, certain phenomena become apprehensible and these phenomena are then fostered as arguments for evolution.

But in reality they are not arguments favoring evolution, because they also become apprehensible when one assumes creation. For example, the morphological correspondences between the

organisms can be understood by common descent, but also by a common design by a Creator. A common typological plan, e.g., can be very useful for a corresponding manner of life, and this could very well be a reason why God created many animals according to a similar plan. Moreover, the descent theory is not consistent, for it often supposes suspected "convergences," which are better understood by a common Creator than by evolution (e.g. Mammals vs. Marsupials; the Vertebrate eye vs. the Cephalopod eye).

The same is seen in taxonomy: the taxonomic system may point to common descent or to common design. As a scientist, I prefer the latter, because if evolution had taken place, I could not explain the very distinct separations between the species. In the case of evolution I would have expected a much less discontinuous transition between the species, and I also would wonder how the lower organisms could evolve from the older ancestors without any important alteration whereas the higher organisms evolved from the same ancestors, undergoing many changes. In fact the taxonomic system has nothing to do with a supposed pedigree.

The same is true for the so-called vestigial organs, if any really exist. They might point to descent or to a common creative design. Here again I prefer the latter because vestigial organs, if they are at all "vestigial," are easily thought of as degeneration not evolution. They would be classed as later deviations from the creative design.

The Noachian flood may also account for several of the so-called "proofs" for evolution. Paleontology and geology either teach us the history of life or an arrangement of sediments and organisms during the flood. It will suffice to refer to the work of Morris and Whitcomb¹¹ which shows that the arguments for the geological column are too weak to maintain it. But all these arguments, on the other hand, are easily understood by accepting creation and the flood. Also the geographical distribution of the organisms can be well explained as having taken place after the flood. It is not my point to summarize extensively all the evidence for creation. I am simply asking whether evolutionism as a doctrine is scientifically more acceptable than creationism. Here genetics has helped the creationists because it has shown nothing else than that species are variable but not transformable.

(6) *The reliability of a scientific conception is inversely proportional to the number of unproven postulates on which it is founded.* This is rather a feature of, than a demand for, a scientific conception. But the point is this: when the unproven foundations of a scientific conception are too numerous, one wonders if that conception actually deserves to be called "scientific."

To believe in evolution it is necessary to rely on a number of indications from various disciplines, which may be interpreted as supporting the evolutionistic view but which equally well, or even better, can be understood by the creationistic view.

But it is also necessary for the evolutionists to accept a number of premises which are very essential for his view, which are not proven, for which there is hardly any evidence, and which sometimes are completely improbable. In the former century this was not a problem because the defenders of evolutionism had the firm confidence that the necessary evidence for their presumptions would sooner or later certainly be obtained.

However, the pillars of evolutionism have not been supported at all during the last hundred years, but have been weakened consistently by the newer evidence. In that sense evolutionism is but an interesting anachronism. It fitted in a time when people believed in "generatio spontanea," whereas one now feels it a dilemma to believe in a spontaneous generation that cannot occur. It was also the time that the uniformitarianism of Lyell successfully could join issue with the catastrophe theories, whereas we now know that geologists do little else than study cataclysms.

Evolution arose in the time that three-fourths of the suggested life history was completely missing in the fossil record, because it took place before the Cambrian and the scholars trusted that the Precambrian would yield a huge amount of fossils illustrating this lacking part. But even today hardly a single undisputed Precambrian fossil exists. This means that, because all Invertebrate phyla are represented in the Cambrian, evolutionists have to accept on the basis of faith, without any evidence, that all viruses, bacteria, plants, and animals are really interrelated. Secondly, they must assert that the Metazoans have originated from the Protozoans (which on other grounds is hardly believable). Thirdly, they must trust that the Invertebrate phyla are interrelated, and that the Vertebrates descended from the Invertebrates.

Evolutionists base their views on faith, and thus do not have the right to reproach the creationists for their belief in a Creator. One need not espouse theistic evolutionism either, because we are not convinced at all that the earth strata represent vast geological periods. It is an established fact that every known rock (from Cambrian to Quaternary) has been found to lie somewhere directly on the Precambrian. Nowhere has a representative part of the supposed geological column been found, while on several places the strata are arranged in a reversed sequence without a trace of any secondary cataclysm.

In this way we could go on mentioning many unfounded evolutionary assertions which have not been supported in the last century. It should be no wonder therefore that young scientists in particular raise questions and feel doubts as to the validity of evolutionism. It would be unreal, however, to expect that finally evolutionism would be rejected. As long as most scientists refuse to accept that there is an alternative supplied by the Word of God, they will cling to their unacceptable and refuted doctrine which they hold as their faith—their own religion.

Conclusion

Two points have been stressed: First, that on merely logical and philosophical grounds it is wrong to say that evolutionism is more "scientific" than creationism. From the objective, unprejudiced point of view they are both equivalent alternatives. Secondly, however, on natural-scientific grounds evolutionism does not satisfy any of the demands that should be made of it. As to the facts known at the moment it must be clear that creationism should be favored as being more consistent with our knowledge of nature. Of course, Christian faith actually does not need scientific proofs for its consistency, but on the other hand it is important to recognize that creationism is not based on blind faith neglecting the irrevocable evidence. Actually, its foundations in scientific respect are better and firmer than those of materialism. To the individual that believes every word of Scripture to be the infallible Word of God, this will be no surprise.

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LETTER TO THE EDITOR

May I call attention to another subtlety in argument for Creation?

It is certainly necessary to establish the religious character of the question, but I fear the war may be lost in gaining a strong point when we speak of evolution as being grounded on faith.

By looking a little deeper we see that evolution is not a faith but unfaith. It only pretends to have an affirmation to be believed; but the pretended affirmation is in fact nothing more than a negation.

Evolution is properly categorized as systematic denial that God has Created us. The evolutionist cannot agree with anyone as to what he believes; but all are at one as to what they don't believe.

One heated discussion with a prominent geologist ended up with his exasperated statement: "The trouble with you fellows is that you believe the Bible is true."

In other words, any belief that does not fit in with propositional truth of Scripture is acceptable. What is wrong is faith—just good faith in that things are what they seem to be.

Few things could be more disastrous to a position grounded on truth than one which thoughtlessly makes faith in God an alternative to "faith" in evolution. This reduces Christianity to no more than one of the imagined "World's Great Religions."

Holding to evolution is unbelief, faith only in a negation.

Faithfully yours,
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NEW PUBLICATION

Science and Creation A Handbook for Teachers. 1971. Henry M. Morris, William W. Boardman, and Robert F. Koontz. Creation-Science Research Center, 2716 Madison Ave., San Diego, CA 92116. (\$3.50) 98 pages. Paperback.

This newest publication of the Creation-Science Research Center provides teachers and parents a handbook of information to present creation as a viable scientific alternative to evolution. Although entirely scientific in emphasis, this book is designed for laymen and is suitable for use in the public schools as well as for individual or group study. As stated in the Introduction:

Most teachers would be willing to make the creation alternative available to their students if they could. It is the purpose of this

handbook to provide the tools necessary for this purpose, explaining the scientific basis of special creation and also pointing out some of the important scientific deficiencies in the evolutionary system. The evolutionary framework is not discussed directly (except as in contrast to special creation) since it is already familiar to most teachers and is implicit in most scientific textbooks. This Handbook is thus intended primarily for use as a supplement to whatever textbooks are in use for each particular course, to enable the teacher to give both points of view wherever the question of origin arises. It may be used in all grades, since it is structured around general scientific disciplines and conceptual systems rather than around any particular textbook. (p. 7)

RESISTANCE OF LIVING ORGANISMS TO THE SECOND LAW OF THERMODYNAMICS: IRREVERSIBLE PROCESSES, OPEN SYSTEMS, CREATION, AND EVOLUTION

EMMETT L. WILLIAMS, JR.*

Resistance of living organisms to the degenerating effects called for by the second law of thermodynamics is considered. Discussion is approached from the avenues of classical and irreversible thermodynamics. Whether a living system is considered as open or as a steady state, eventually the effects of the second law will destroy it. The methodology of thermodynamics is not advanced enough as yet to be applied quantitatively to life. However, it is felt that the complexity of living systems is a result initially of creative acts by God and not a result of evolutionary processes.

I. Introduction

Inorganic systems are known to obey the second law of thermodynamics and hence tend to reach a state of maximum entropy. Living organisms also tend to reach a state of maximum entropy, but at a relatively slower rate.

The "life principle," whatever it may be, appears to sustain great order (low entropy) in the organism so much longer than one would expect in an inanimate system that it has led some scientists to claim that the second law of thermodynamics does not apply to living organisms.¹ This is a serious charge. If this basic law of science is violated in the living realm of nature, why can it not be violated under proper conditions in the inanimate realm of nature?

There is no valid experimental evidence of a violation of the second law of thermodynamics in either animate or inanimate material. This places the evolutionist in the position of passively or actively denying the observable (second law) to believe the unobservable (macroevolution).

The purpose of this paper is to examine the methodology of the thermodynamics of irreversible processes and its relation to living organisms, to see if creation or evolution, offers the best interpretative framework for what is known. From this paper it is hoped that the reader will see that living systems do not appear to violate the second law. Not enough is known to relate thermodynamic methods rigorously to living systems.

II. Classical Thermodynamics and Time

Living systems appear to be more successful in resisting degeneration than non-living systems. The obvious variable involved is time. The living system will eventually degenerate, but not as rapidly as non-living material.

In classical thermodynamics time is *not* a variable, and is never considered. Normally a system

is investigated in one state, allowed to change to another state and investigated again. Typical independent variables are temperature, pressure, volume, concentration, and entropy. They are specified at the state of interest.

After a change has occurred the total entropy change (dS) can be determined. Never is the rate of entropy change ($\frac{dS}{dt}$) considered. Systems are never investigated conceptually in a state of change, but between one definite state and another.

The concept of entropy has taken on many interpretations from the necessary wastage of heat² in heat engines to a measure of disorder from statistical considerations³. Entropy can be considered as a thermodynamic potential, the sign of which indicates the direction taken by a spontaneous process.

If $dS > 0$ the process occurs spontaneously, and if $dS < 0$ the process is not spontaneous, but is forced by some external source. For irreversible processes in isolated systems the sign of dS will always be positive (i.e. $dS > 0$)⁴. Isolated systems are considered conceptually simply because *only spontaneous* changes can occur in them⁵. The conclusion from this is that the entropy of any thermodynamic system will always increase during a spontaneous change.

Once the process is completed the entropy difference ($dS = S_2 - S_1$) between the initial state (1) and final state (2) is calculated. The rate of entropy change $\frac{dS}{dt}$ is never known.

If one wishes to calculate $\frac{dS}{dt}$ there must be a "wedding" between thermodynamics and kinetics (study of rate processes) so the rate of change can be introduced. The science of thermodynamics of irreversible processes has developed from these considerations. Although this relatively new science offers promise, the best efforts of researchers have simply verified the results obtainable from classical thermodynamic techniques⁶.

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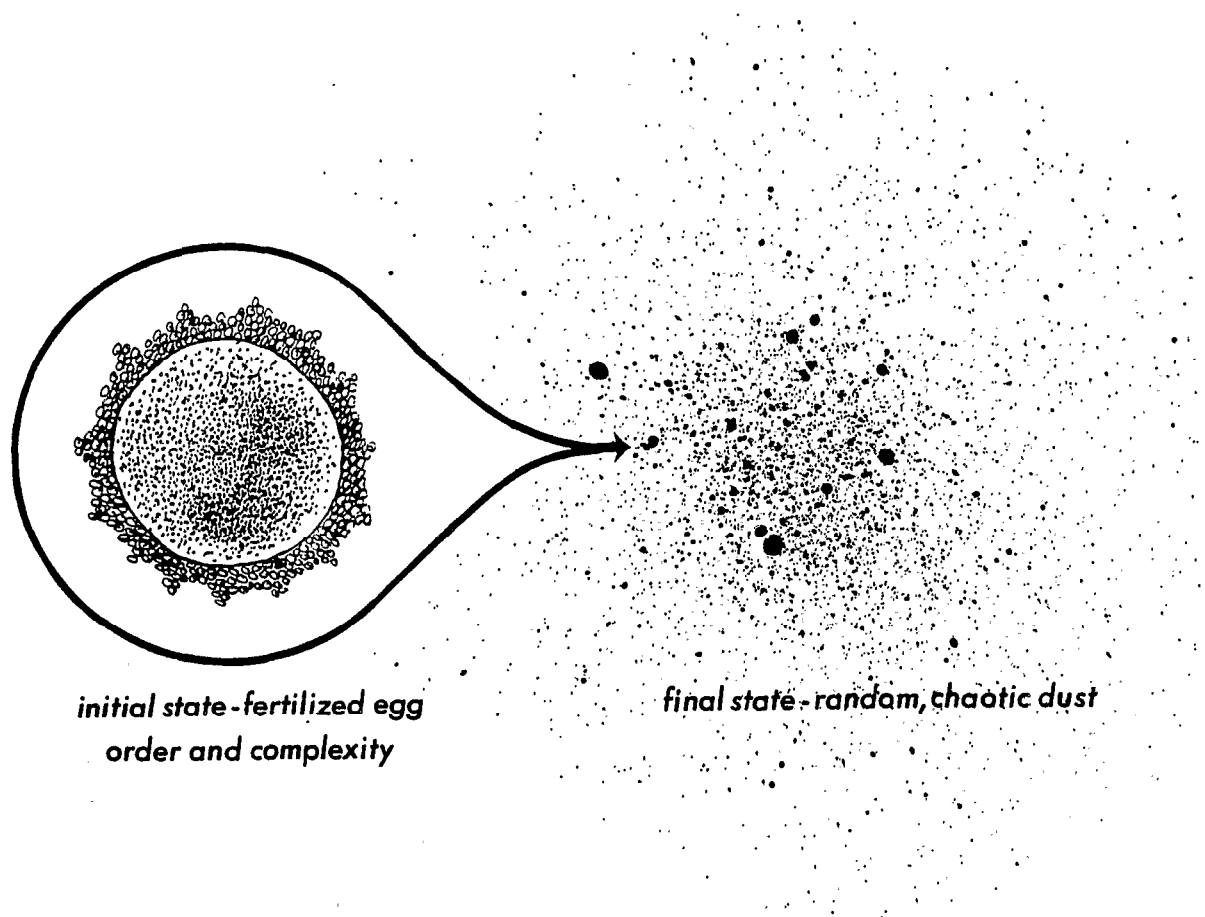


Figure 1. Qualitative representation of the initial and final state of a living organism.

III. Living Systems and Classical Thermodynamic Methodology

Living systems can be investigated qualitatively using classical thermodynamic methods. The necessary procedure is to choose an initial and final state and to determine *qualitatively* an order vs. disorder relationship between the two. If we use biological systems that require a male-female reproduction, immediately after conception we have a cell or cells with all of the genetic information available to grow into a mature adult if the proper energy is provided. Energy includes mass as well as its other forms. This initial state is highly ordered.

Consider the organism sometime after physical death (Ecc. 3:20). The organism has decayed into dust. This final state is an example of gross disorder. From the initial order to the final state of disorder the entropy of the organism has increased. (See Figure 1) Thus it can be seen that living systems are subject to the second law. In any living system, this analysis will be true.

Any living organism survives because it takes energy in from its surroundings. These energy

transfer operations are inefficient. This inefficiency could contribute to the organism "wearing out" and finally dying. If these processes were 100% efficient, the organism could maintain itself much more easily.

It is impossible to perform many realistic quantitative calculations on the thermodynamics of living systems because of the state of the art of biology and the present methodology of classical thermodynamics. One of the problems is that conceptually all systems in classical thermodynamics must be able to be completely reversible, i.e. be able to return to an initial state at the finish of a cyclic process.

Very little thought is necessary to realize that living systems are in no way reversible, but they may be *carefully* examined as systems in which irreversible processes occur. But one must be extremely cautious in doing this. Note this comment by Kestin⁷:

The need for the stipulation that the initial state 1 can *always* be restored from state 2 which had previously been reached by an irreversible process is fundamental to the

development of thermodynamics because only then is it possible to determine the properties of systems by measurements conducted prior to the performance of a process. Without the knowledge of properties, no process could be analyzed in quantitative terms. Not all systems encountered in nature possess this attribute. A notable exception is afforded by all living organisms. Superficially, living organisms perform an irreversible process during their life cycle, but in stating this we yield to the impulse of using the term "irreversible process" semantically, and not in its technical meaning appropriate in thermodynamics. For this reason, systems like biological ones cannot be analyzed in terms of the equations of thermodynamics because no earlier state of such a system can ever be restored from a later state. Loosely speaking, one can say that a thermodynamic system possesses no "memory" or "history." A given state of the system is always described by its properties as they are measured at that state, and not by the details of the process, which enabled the system to assume the state under consideration.

Bridgman⁸ makes this interesting remark:

One may anticipate that the extension of the entropy concept to more complicated phenomena, perhaps including ultimately the biological phenomena of life, is coextensive with the discovery of macroscopic parameters adequate for the exhaustive description of these phenomena.

Are these parameters available in the methodology of non-equilibrium thermodynamics?

IV. Methodology of Thermodynamics of Irreversible Processes

Irreversible thermodynamic methods are used to deal with the behavior of a system during the course of an irreversible process⁹. As mentioned earlier this is a combination of the sciences of thermodynamics and kinetics. However some new postulates must be introduced, and if the calculations made using these new postulates check with those made assuming reversible transformations and classical laws, the postulates are assumed to be correct¹⁰⁻¹².

In many cases the validity of the postulates are not known¹³. This requirement poses the restriction that any process investigated cannot at any time be too far from an equilibrium state since this is where classical laws apply. Much should be known about the irreversible process so that no mistakes are made in formulating the proper equations of state.

The central concept in both irreversible and classical thermodynamics is entropy^{14,15}. The

science has been developed on the premise that entropy increases in any irreversible adiabatic process¹⁶. In other words

$$dS \geq \frac{dQ_{rev}}{T} = dS_{rev} \quad (1)$$

where dS is the entropy change because of an irreversible change, dS_{rev} is the entropy change because of a reversible change, dQ_{rev} is the heat gained or lost in a reversible process, and T is the absolute temperature.

The expression is normally integrated between an initial and final state (the start and finish of the process). This definition of entropy¹⁷ is valid for closed systems (exchange of energy with surroundings), but biological systems are considered open systems (exchange of energy and mass with surroundings)¹⁸.

Since it is necessary to visualize the flow of mass into and out of an open system* the change in entropy (dS) is split into two parts,¹⁹ dS_e and dS_i where dS_e is the change in entropy because of interactions between system and surroundings (externally induced) and dS_i is the change in entropy occurring because of changes within the system (internally induced). Then,

$$dS = dS_e + dS_i \quad (2)$$

and $dS_i > 0$ for irreversible processes. (3)

Since it is desired to find the entropy change during a process, how can $\left(\frac{dS}{dt}\right)$, the entropy change with time, be visualized conceptually? Entropy is treated as a nonconserved fluid and the equation of continuity from fluid mechanics is used^{20,21}.

The key to a successful manipulation of the entropy property is the artifice of visualizing entropy as a substance capable of flowing like water from one part of space to another²².

Since entropy is an artificial construct, entropy flow cannot be measured directly (if such flow exists), whereas liquid flow (water, etc.) can be measured by a flowmeter. However there is no such device as an entropy flowmeter. This happens to be one of the weaknesses of the model. Using such a model a scientist can never be sure his calculations are correct unless he checks them against known results.

Normally the only way to check the calculated results is to compare them with known classical thermodynamic and kinetic evidences. If the calculations cannot be verified by direct observation, experimentation, or firmly established classical laws, then they are merely hypotheses.

*Obviously mass is a form of energy. Possibly in the future scientists will develop parameters so that energy in any form can be represented quite generally in thermodynamic equations of state.

There is certainly nothing wrong with this procedure. However no great weight should be placed on unverifiable equations.

Pushing this objection aside, the model will be further developed. The entropy flux density (J_s) is defined as the direction and magnitude of the entropy crossing a unit area perpendicular to the flow per unit time. (See Figure 2). Thus.

$$J_s = \frac{dS}{dt} \frac{\mathbf{n}}{dA} \quad (4)$$

where $\mathbf{n}$ is unit vector perpendicular to dA the unit area and $dA = dzdy$. Equation 4 can be better represented as a scalar quantity.

$$\frac{dS}{dt} = \int \mathbf{n} \cdot \mathbf{J}_s dA \quad (5)$$

$\frac{dS}{dt}$ is sometimes called the rate of entropy production, or the amount of entropy created per unit time in an irreversible process. The amount of entropy leaving a unit volume per unit time is the excess of entropy that leaves the unit volume minus the entropy that enters the volume and can be represented using the divergence of a vector field²³.

$$\text{div } \mathbf{J}_s = \nabla \cdot \mathbf{J}_s = \frac{\partial J_{sx}}{\partial x} + \frac{\partial J_{sy}}{\partial y} + \frac{\partial J_{sz}}{\partial z} \quad (6)$$

Using the divergence theorem²⁴ the rate of entropy production for a volume (V) becomes

$$\int_A \mathbf{n} \cdot \mathbf{J}_s dA = \int_V \text{div } \mathbf{J}_s dV \quad (7)$$

Then for any volume (dV) the rate of increase of entropy inside dV plus the outward flux of entropy from dV equals the entropy production inside dV (See Figure 3). Mathematically this is represented as

$$\frac{\partial(\rho s)}{\partial t} dV + (\text{div } \mathbf{J}_s) dV = \sigma dV \quad (8)$$

where ρ is the density of the matter in dV and s is the entropy per unit mass such that $S = \int_V \rho s dV$.

s is used to denote the rate of entropy production per unit volume $\left(\frac{dS}{dt dV}\right)$ Cancelling out dV ,

$$\frac{\partial(\rho s)}{\partial t} + \text{div } \mathbf{J}_s = \sigma. \quad (9)$$

This can be called the equation of continuity for entropy flow. For reversible processes²⁵

$$\sigma = 0 \quad (10)$$

For irreversible processes

$$\sigma > 0 \quad (11)$$

Actually the quantities J_s and s in equation (9) are undefined²⁶. Other postulates must be introduced so that a choice can be made for J_s and s . Remember that a scientist's presuppositions will primarily determine what choice will be made. As yet there is no clear-cut way to find out J_s or s , so that there is no direct verification for any chosen quantity unless it can be shown to agree with experimental results.

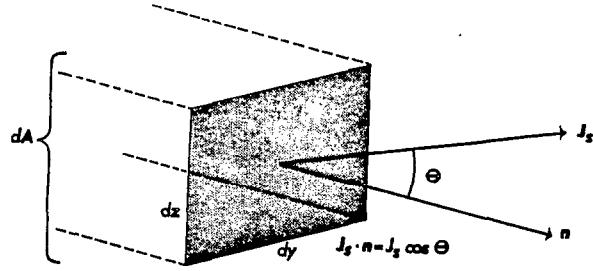


Figure 2. Representation of entropy flux (J_s) through a unit area ($dA = dydz$).

The mathematical sign (+ or -) of certain quantities is known from classical thermodynamics. Equations (3) and (11) are positive because entropy increases with irreversible changes that occur inside the system. Using these as guidelines some calculations yield verifiable results²⁶. This is done by introducing empirical flow equations that depend upon gradients, such as heat flow which develops because of a change in temperature with distance. Examples of some gradient equations are given below:²⁷

Heat Flow:

$$J_H = -K_T \text{ grad } T \text{ (Fourier's law)} \quad (12)$$

Electric Current:

$$J_E = -K \text{ grad } V \text{ (Ohm's law)} \quad (13)$$

Fluid Flow:

$$J_F = -C_F \text{ grad } P \text{ (Poiseuille's law)} \quad (14)$$

Diffusion:

$$J_D = -D \text{ grad } C \text{ (Fick's law)} \quad (15)$$

K_T is the thermal conductivity, K is the electrical conductivity, C_F is a frictional coefficient related to the viscosity, and D is the diffusion coefficient. T is temperature, V is electrical potential, P is pressure, and C is concentration. Yourgrau et al²⁸ state what has been accomplished utilizing this methodology:

We should emphasize that this step represents a marriage between a purely thermodynamic result and a set of equations not derivable from thermodynamic principles. Admittedly the adoption of the recommended procedure has so far led only to relatively trivial results. This is attributable to the fact that we have ignored the possibility of one process affecting or interfering with another when they happen simultaneously.

Generalized flow equations are introduced for each process occurring in the system to overcome the difficulty with competing processes. The form of these equations is

$$J = LX \quad (16)$$

where X is the gradient or affinity causing the flux (J) and L is a constant. X is sometimes referred to as the thermodynamic force or potential. This would make equation (16) a thermo-

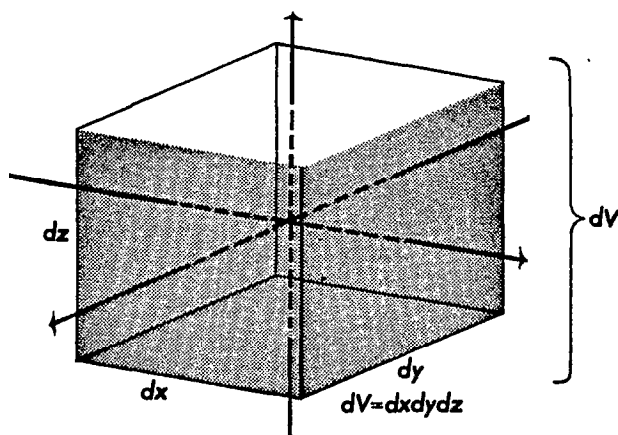


Figure 3. Unit volume (dV) from which entropy can flow.

dynamic equation of motion. For n competing processes the total flux J_i is

$$J_i = \sum_{j=1}^n L_{ij} X_j \quad (i = 1, 2, \dots, n) \quad (17)$$

$$L_{ij} = \left(\frac{\partial J_i}{\partial X_j} \right)_{X_k} \quad k \neq j \quad (18)$$

Higher order terms are ignored. From this the entropy production (s) is given as

$$\sigma = \sum_i J_i X_i \quad (19)$$

or for several competing processes at once,

$$\sigma = \sum_i \sum_j L_{ij} X_i X_j \quad (20)$$

The postulates for irreversible thermodynamics are as follows: I. The Gibbs equation for the first law is assumed to be true (even though the system is not at equilibrium).

$$dU = TdS - PdV + \sum_i \mu_i dw_i \quad (21)$$

where dU is the change in internal energy of a system, $TdS = dQ$, the heat gained or lost by system, PdV is mechanical work done on or by steam (P is pressure and dV is volume change), μ_i is the partial specific Gibbs function of substance (i) (chemical or thermodynamic potential), and dw_i is the mass fraction of substance (i).

II. The rate of entropy production (s) is the sum of the products of the forces and fluxes and is always greater than or equal to zero.

III. Each flux, to account for entropy production, is a linear combination of the forces (equations 16 and 17). These postulates cannot be considered to be as rigorous as the first and second laws of thermodynamics and are not new principles equal to these two²⁹.

Obtaining answers using the above equations is an arduous task (due to various system interactions). The Onsager reciprocity relations³⁰ are used to overcome many of the difficulties. The

general form of the relations is shown below. They deal with the relationship between the gradients.

$$L_{ij} = L_{ji} \quad (22)$$

The relations are developed from atomic models and statistical assumptions on the behavior of these models.

The procedure used in determining the forces and fluxes, if not done properly, will completely invalidate the results³¹. As the theory becomes more advanced and more experimental work is accomplished, possible selection of forces and fluxes may become more scientific, but the reciprocity relations can never be considered universally valid, as are the first and second laws³¹.

Caution should be observed when working with the phenomenological equations so that a result contrary to the first and second laws is not obtained. The "tail should not wag the dog." The first and second laws must be given pre-eminence over kinetic considerations. Many evolutionists in their zeal to do away with the second law may choose to ignore this warning and allow kinetic considerations to override the second law regardless of the unscientific results of such a procedure. Tykodi³² notes that

An obsessive concern with the explicit dependence of currents on affinities and other parameters of the system is rather uncharacteristic of thermodynamics: in the case of chemical equilibrium, for example, we do not need to know the exact kinetic mechanism (the precise forward and backward rate expressions) in order to find the thermodynamic conditions of equilibrium and the expression for the equilibrium constant. I feel that just as ordinary thermodynamics places its main emphasis on the conditions of equilibrium so the thermodynamics of steady states should place its main emphasis on the conditions of migrational equilibrium in given spatial fields rather than on problems of "matter and motion" (items that are more a part of general physics than of anything else). Furthermore, the fundamental experimental system is the container plus the contents plus the interaction of container and contents with the surroundings. The experimenter would prefer a global language that reflects the laboratory realities. Now the experimenter never *measures* directly what happens at a single point in space, and a language couched in terms of local properties and gradients makes his life that much more difficult and gives him little or no guidance in dealing with the effect on the container or the process being studied and in deciding on ways to minimize that effect.

V. Entropy Sinks Impossible

Many evolutionists try to justify their processes of development by making a claim that entropy could increase in one part of the universe while it is decreasing in this part of the universe as long as the total entropy content of the universe increases. This allows "evolution" to occur in a small part of the universe while the entropy of the total universe increases. Such a statement cannot be supported, and is an appeal to blind faith.

What the evolutionist is demanding is to have an entropy sink in a system. No part of any thermodynamic system, living or inanimate has ever been shown to act as an entropy sink. Essentially the claim is this:

$$dS_I \geq 0 \quad (23)$$

I—An entropy increase in most of the universe. However,

$$dS_{II} \leq 0 \quad (24)$$

II—An entropy decrease in the part of the universe where evolution has occurred. This would be justified as long as

$$dS_T = dS_I + dS_{II} \geq 0 \quad (25)$$

where dS_T is the total entropy change in the system and $dS_I > dS_{II}$. However since evolution is an irreversible process³³, and $dS > 0$ for irreversible process, then $dS_T = dS_I + dS_{II} \geq 0$, but

$$dS_I \geq 0 \text{ and } dS_{II} \geq 0 \quad (26)$$

since irreversible processes are occurring in both I and II and the first situation (equation 24) cannot be true³⁴.

Thus in one part of a system there can be no absorption of entropy (entropy sink) compensated by a sufficient production of entropy in another part of the system. Any irreversible process that occurs must cause an increase in entropy. In any living system there can be no entropy sink where entropy can be removed so that the organism can evolve. Eventually death will claim any living material and no rise in complexity and order can be expected from such a mechanism as this.

VI. Living Systems as Steady States

In recent years a great deal of emphasis has been placed on mature or adult systems as being steady states³⁵⁻³⁹. It is imagined that as the living system grows to maturity or adulthood it changes from a non-steady to a steady state. The steady state is defined as a state that is time independent. Once a steady state is achieved it does not tend to change with time.

Obviously, no living system can exist forever as a time independent system. The model *completely* fails. Living systems are not steady states, since they die. Any attempt to avoid this by restricting the investigation to growth processes completely distorts the true picture of living organism.

Living organisms, in particular the human body, can be looked upon as constituting fuel cells. In a living organism the food intake serves as the fuel and the blood stream plays the part of the electrolyte. The chemical reaction is enhanced by the catalytic action of enzymes, and as a result energy is produced by direct conversion from the chemical energy of the fuel-oxygen intake. A portion of this energy is electrical in nature. However, in contrast with man-made fuel cells, living organisms cannot operate in steady state over their life span, and cannot be regenerated; the irreversible changes which occur in them inevitably drive them to death⁴⁰.

Many times the wording of the thermodynamicist has been misunderstood by evolutionists. Consider this comment by Prigogine⁴¹.

Further, the fact that during growth living organisms actually show a decrease of entropy production during evolution up to the stationary state.

Prigogine claims that $\frac{dS}{dt}$ (rate of entropy production) decreases as an organism grows to maturity. It is not claimed that entropy decreases, only that the rate at which entropy increases is slower at maturity than during growth. The stationary or steady state is considered to be the state of minimum entropy production. This is very similar to equilibrium states in classical thermodynamics. The equilibrium state is the state of maximum entropy, and as the system approaches the equilibrium state its rate of increase of entropy becomes less and less until at equilibrium it reaches maximum disorder, and the entropy production rate is zero (no further increase in entropy possible), or the system approaches equilibrium asymptotically so that the rate of entropy increase is very slow as it nears equilibrium, as illustrated in Figure 4.

Evolution in this sense is simply limited change and not macroevolution from molecules to man. In other words as the living system grows (changes) to maturity (wrongly identified as the steady state) the rate of entropy production decreases. This is not a violation of the second law, and is similar to systems approaching the equilibrium state in classical thermodynamics.

Evolutionists err when they claim that the second law does not apply to living systems. In their zeal to claim an entropy decrease they fail to realize that it is the rate of entropy production that decreases, and not the entropy itself!

Many evolutionists erroneously conclude that during growth the organism is increasing in complexity and order. But growth should not be looked upon as a time of increase in order and complexity. Growth is definitely an increase in

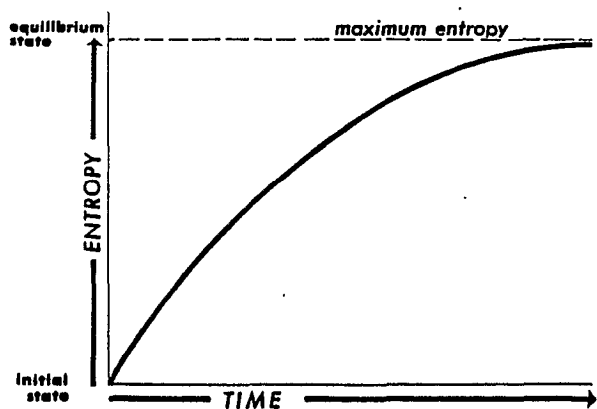


Figure 4. Asymptotic increase of entropy as system approaches equilibrium state.

size, but the complexity and the genetic information necessary for growth was initially in the starting cell of the organism. The cell in no way "evolves" or acquires this order from any outside source. The capacity to attain maturity is in this starting state. The starting cell must be more complex than any cell in the mature organism or at least equal in complexity.

Consider growth from a creationist standpoint. God created a fully-functioning universe and living organisms on earth. As far as can be determined from scripture the organisms were created fully grown. Using a classical thermodynamic qualitative approach the organisms simply fill the earth after its kind and replicate the original created order when adult produces adult, etc. (See Figure 5)

Adam had children which grew to maturity, they had children which grew to maturity, etc. From the initial to the final state there is no increase in order. Original order is at best being duplicated. When sin entered the world the disordering effects of the second law would have reduced the order in successive generations by mutations.

Thus growth cannot be considered as a violation of the second law or an increase in complexity of the organism. The original order (full grown adult) had to be created by God. It did not evolve to the ordered state. Once the order is present it can reproduce itself (reproduction and growth).

Another qualitative argument that can be brought to bear against evolution is from a statistical viewpoint. The statistical, mechanical approach to entropy⁴² is given by

$$S = k \ln w \quad (27)$$

where S is the entropy, w is the possible number of microstates of a system and k is Boltzmann's constant.

For the disordered state, w is very large and for the ordered state it is quite small⁴². It would

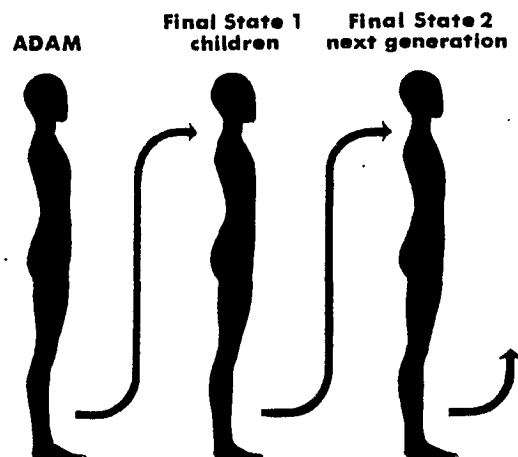


Figure 5. Schematic diagram of reproduction and growth of succeeding generations from initial created state.

appear that w would be very small for a living system since no more than a few microstates would be possible. Never at any time could these number of microstates decrease measurably since they would be low already. So there is no realistic way of discussing growth as a means of decreasing w which would then cause a decrease in the entropy content of the organism.

This difference is overlooked by many evolutionists when comparing living and non-living systems. For living systems the number of microstates available should be very small (if the system remains alive). Whereas non-living systems should have many available microstates. Thus the entropy of a living system will always be lower than that of a non-living system, but this order had to be created originally not evolved.

Again, with regard to growth, consider the starting cell, cells, or fertilized egg. It would appear that $w \approx 1$, or any gross rearrangement after fertilization would cause death or degeneration in the growing organism.

However when the organism is full-grown, more possible microstates would be possible such that $w \geq 1$. More microstates could be visualized from the sheer bulk of the system. Also more system contamination could be tolerated in a mature organism and the possible microstates could be increased as a result of this.

This increase in w (number of possible microstates) could be visualized as the different ways of arranging cells with various degrees of difference and various levels of contamination and still have the adult organism remain alive. Thus there will be a decrease in system order with growth, or *no more* than a maintenance of the same order. Certainly no increase in order or complexity

should be expected. No rigor is attached to the above argument, but is used simply to illustrate how growth cannot be considered as an ordering procedure.

Often evolutionists claim that decreases in entropy are easily attained⁴¹ and thus evolution from disorder to order is easily possible. The "proof" given for such assertions are examples of reversible processes. For instance the thermal transpiration of gases to develop a pressure gradient under a maintained temperature gradient is sometimes used⁴². The gas in this state has a lower entropy than the initial disordered state with no gradient present. However this steady state has to be maintained by a temperature gradient.

Once the gradient is removed, or given enough time the system would fail, and the gas would return to the original state. If the temperature gradient was reapplied, the pressure gradient would develop. The process is reversible and cannot be compared with a system that has only irreversible processes taking place. It does not approximate a living system. For instance life cannot be reversibly removed and reinstated in a living system. It is impossible to return the living system to some prior state in past time. Again the evolutionary analogy fails.

The temperature gradient mentioned above or any other restraint maintained on the gas system or any other system is not a natural process depending upon random changes only. Such a situation is a controlled process and would not apply to basic evolutionary postulates (random variations). Intelligent beings can set up a system to effect many "ordering" operations, but such ordering cannot be accomplished by natural, "unintelligent" processes.

Sometimes the freezing of water, thawing, refreezing, etc. is used to illustrate how order can be easily obtained. Again this is a reversible process, $\text{ice} \rightleftharpoons \text{liquid}$. The solid is assumed to have more atomic order than the liquid, and everytime the water solidifies the system order increases. Of course defects in the solid state⁴³ are ignored in such an argument. However this reversible change can occur over and over again, and no evolution can be observed in the system other than $\text{ice} \rightleftharpoons \text{liquid}$. How can this be applied to living systems where irreversible changes occur? It is impossible.*

In approaching the problem of evolution using open systems and stationary states, life is already assumed to be present. This is an improper place to start any discussion about the possibility of

evolution for it has already been assumed that life spontaneously generated. This faith-postulate has been very neatly avoided. The arguments against evolution become more weighty when inanimate systems are considered, and there is no hope for chemical evolution⁴⁴ in face of the second law of thermodynamics.

The problem must always be faced, not avoided, of how did life get here. One cannot talk about evolution in living systems without assuming spontaneous generation and completely ignoring creation. No evolutionist should be allowed to start his argument at such a point and should continually be pushed back to beginnings rather than left alone to assume any starting conditions he wishes.

VII. Negentropy and Living Systems

A great deal of work and study has been done on the idea that the second law does not apply to living systems⁴⁵⁻⁴⁷, since they exist and feed on a substance called negentropy which allows them to resist the effects of the second law and maintain their high degree of complexity⁴⁸. The system takes in food which is a high-grade energy (low entropy content); it degrades this high energy form to refuse (high entropy) and supposedly lives off of this degradation of the food. This allows the feeder to stabilize and increase its own order. The refuse becomes an entropy sink where the living system can reject excess entropy.

The refuse cannot be an entropy sink and if it is, why can't the "feeder" organism maintain its state of low entropy indefinitely? Why does the organism eventually die? Again the time factor is overlooked in this approach. To consistently use this argument the organism should be able to maintain itself indefinitely. It is questioned that negentropy applies here. It has a definite place in information theory, but when considering this aspect of living systems there will be nothing that the system takes in that will have negentropy.

A simple example will illustrate this. Food coming into any organism has a definite positive entropy content since it is taken from a cursed creation. The digestive processes are irreversible processes and cause an entropy increase within the organism. While food is being degraded the system must work to digest the food. This work generates entropy. Thus there has been an irreversible increase in entropy. If the food was providing a quantity called negentropy, it would be possible for the organism to decrease its entropy content.

Let us follow this process of supposed entropy decrease. As the organism grows and takes in negentropy to grow, it decreases in entropy con-

*In the above "reversible" change the entropy change of the system plus the entropy change in the surroundings always is positive. The so-called entropy decrease is really artificial when the total analysis is made.

tent. Supposedly, the organism is becoming more and more ordered, attaining more complexity. It is getting better and better.

Yet all through the stages of conception, birth, and growth to a "stationary" state death is possible. Growing systems die. Indeed, if they are decreasing in entropy, why do they die? The entropy decrease should indicate the organism is being rendered more resistant to changes such as death.

Why, at adulthood, does the organism suddenly stop decreasing in entropy? Why can't this entropy rejection continue until there is a uniform low entropy in all living organisms? Such a process would enable them to maintain this low entropy instead of aging and eventually dying. As can be seen, the analysis may fit a small time in the cycle of a living system, but it is far from complete.

Food intake may allow a system to maintain its present entropy content, or the entropy increase may be very slow for awhile, but never can there be any justification for an entropy decrease. Continual ordering or betterment would render death less likely, whereas the probability of death increases with the passage of time for any organism.

Suggesting the introduction of system poisons to cause death does not solve the problem either. This is like "having your cake and eating it too." You want an entropy decrease and you conceptually provide for it. You then want an entropy increase and you provide conceptually for it. The reasoning is not consistent.

It appears that the most consistent approach to the problem is to allow at all stages of life for an increase in entropy. It certainly would not be as rapid as a closed or isolated system but nevertheless it would increase. Once death occurred, the entropy increase would become more rapid. It is felt that this approach would be more consistent with the second law of thermodynamics.

VIII. Conclusion

The life principle and order of a living system, etc. was placed in the original kinds at creation. God gave these systems the ability to reproduce this order (fill the earth, after its kind). When sin entered the world, this created order began to decrease; each successive generation containing slightly less order than the previous one. However one must be careful with this analysis for the possibility to replicate this order cannot be completely overcome by the effects of the second law of thermodynamics. This biological conservation is a strong principle, and the increasing disorder from generation to generation in our time appears to be slight.

A great deal has been done by biologists and thermodynamicists to apply thermodynamics to

living systems, but an immense amount of additional work needs to be accomplished. Also if evolutionary overtones are maintained as pre-suppositions, a great deal of the study will be invalidated from the start. Creationists must approach the problem from their standpoint. Always a creationist study must be guided and undergirded by Biblical considerations. Never can Biblical truth be rejected, disregarded or explained away.

So far irreversible thermodynamics has been applied mainly to growth of a living organism to adulthood. Weaknesses of this approach have been explored. This is a far cry from any evolutionary development of molecules to man. Creationist alternatives have been suggested. No one can show scientifically that living systems violate the second law of thermodynamics. Only evolutionary interpretation or wishful thinking can suggest this. There is simply not enough scientific information available to substantiate the claim that living systems violate the second law of thermodynamics. Creationist alternatives should be more appealing to Christians. Open systems offer no escape hatch for evolutionists to avoid the second law.

Actually it is not possible to speak of living organisms from a quantitative thermodynamic standpoint. Landsberg⁴⁹ states that

There is also no clear understanding yet of the best way of using thermodynamics to elucidate the key properties of living matter. It seems that thermodynamics should have a greater contribution to make than has so far been possible, but there are clearly several major conceptual difficulties to be overcome first.

The complexity of living organisms makes any analysis intractable. This may lead one to the conclusion that life is more than "a sack full of chemicals." The author believes that the complexity of living organisms is a result of creation by God. God's power is shown in His creation. To Him be the Honor and Glory!

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ON THE FITNESS OF THE LAWS OF NATURE

HAROLD ARMSTRONG*

In this paper there is an attempt to examine the origin of "natural laws." The special creationist and general evolutionist are both asked to explain the obvious "fitness" observed in these natural laws. It is concluded that the laws are difficult if not totally impossible to comprehend in terms of evolutionary origin because the laws point unerringly to a lawgiver.

Introduction

When I was a boy, at school, we used to have a subject which we called Nature Study. Nowadays it would be included under Science. One thing mentioned in Nature Study was "how animals are adapted to their environment."

It is undoubtedly true that animals are adapted to their environment: birds—light and with great strength in their wings; aquatic animals—well able to swim and dive; and animals of the plains, the jungle, the Arctic, etc.—each adapted to its respective home. That there is such adaptation nobody disputes.

Where people part company is on the question of priority. Is the adaption prior to the animals, or posterior? Was the animal designed to fit into

a certain environment; or was it thrown first into the environment, and left to become adapted, if it lasted long enough? The first answer, of course, is that of Creation; the second, that of evolution.

Much of whatever apparent success evolutionists may have had in explaining adaptation comes from concentrating on rather superficial adaptations, and not considering the more profound ones. For instance, at first thought Darwin's theory of how the giraffe got his long neck might carry a bit of apparent plausibility. (However let it be remarked that Darwin's stories of this kind are not nearly so interesting as Kipling's "Just So" stories. Nor, upon a little consideration, are they any more believable!)

Yet there are difficulties about the giraffe, for the alleged natural selection, according to en-

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vironment, would have to be for several features, not just a long neck. It is highly unlikely that any individual would, just at random, excel in each of several features. Besides, selection would be by characteristics, but inheritance would occur by genes.

More profound adaptations, such as the alleged adaption of some land animal to water until it became a whale, would require that a multitude of changes be made all at once. If only some of them were made, the resulting creature would be neither one thing nor the other. It would be neither a land nor a water animal.

Moreover, an argument which proves too much proves nothing. Surely the alleged ancestors of the whale could not have been any "fonder" of water than otters are; yet the otter remains with us, undoubtedly a land animal and looking much more like a land animal than like a fish. How can the evolutionist explain the history of the otter and the whale?

Everyone would grant, then, that animals are adapted to their environment. What is perhaps not so generally considered is the converse proposition: the environment is adapted to the animals. This is seen especially vividly if we consider as the environment the whole Earth, and ourselves as animals.

Environment Adapted to Organisms?

The fact that the earth was "made to be inhabited" was discussed in several papers in the 1970 *Quarterly*. The point, however, to be made here, is that the whole universe is adapted to us and to the other inhabitants of the world. This "adaption" is to be seen even where we might last think of looking: in what we commonly call the laws of nature.

That there are laws of nature, in some sense, everyone, creationist or evolutionist, would agree. The creationist sees in the laws, as in the things to which the laws apply, the work of the Lawgiver, Who is also the Creator.

What is the evolutionist to say? It will do him no good to maintain that all we can know about the laws comes from what we see happening. A visitor to Britain, for example, would soon conclude that the law there is to drive on the left side.

But the way in which we come to know about laws does not tell us anything about their origin. The law of keeping to the left was either promulgated at some time, or else it arose by common consent. But there is no real distinction here, especially for anyone who holds that authority comes from the people. The difference is then seen to be only one of the degree of formality or informality.

How is anyone who holds that everything evolved to account for the natural laws? If the

universe came into being at some time, did the laws come along with it? The laws are surely contingent in that they could have been otherwise. Nobody would hold that they are "necessary," in the sense that to deny them would lead one into a contradiction.

Did the laws evolve? Are we to suppose that we have had "survival of the fittest universe"? Have there been many different universes, each with different laws, arising at random and at different times? Has this present universe survived because it was the "fittest"? Surely any such propositions would be fantastic.

Again, if the laws evolved, what happened while they were evolving? In any such case the present would not be the key to the past! If it should be maintained that the laws arose, without any separate lawgiver, as the law of keeping to the left may have done; are we to suppose that the different parts of the universe at first interacted at random, but happened upon a certain way and fell into a particular pattern of action? Again, any such notion is fantastic.

We see the laws, rather, and from them we may deduce that there is a Lawgiver. To say otherwise is to deny the principles of sufficient reason. And if an evolutionist should deny that there must be a reason for every contingent thing, it is inconsistent of him to put so much effort into seeking the reasons for the diversity of living beings.

Laws of Nature Are Fitting

Let us consider, then, that God made the universe and everything in it—the laws and the things governed by the laws. The point which we set out to establish is that the laws are fitting—that they are adapted to a world made to be inhabited just as the environment is adapted to the animals.

In one way, it is difficult to investigate this matter, for we find it difficult to imagine the laws of nature anything other than what they in fact are. It may be possible, however, to suggest a few examples to illustrate the thesis,

It was apparently God's intention in creating the universe to have some part of it as a home for material beings. We learn about the creation of corporeal beings from revelation and about their existence from experience. There would be no point in being corporeal unless one could interact with other corporeal beings, of his own kind and of other kinds, living and lifeless. So corporeal beings are, to a certain extent, to be kept together. The Earth is to be kept in one piece, and we and other things on it. Of course, some heavenly bodies need to be fairly close to the Earth, as astronomical distances go, in order to fulfill their purposes; others need to be distant. So gravity serves to keep things together,

some on the Earth, others at various distances, as is appropriate for them.

(Notice, incidentally, that we find an inverse-square law in gravitation, in electrostatics, in magnetostatics, and elsewhere. Is anyone going to suggest that this shows that, e.g., electrostatic forces evolved from gravitational ones, magnetostatic from electrostatic, etc.? Presumably nobody would say anything so absurd. But if resemblance proves nothing about descent here in the matter of physical forces, are we not justified in doubting that it does so in regard to living beings?)

It was also God's purpose that there should be living creatures on His world. To have suitable bodies for these creatures required some complex materials. For such materials to be possible, the laws or organic chemistry (and along with them those of inorganic chemistry) needed to be established. Again, the formation of molecules, etc., is very much tied up with electrical attraction of the various parts of matter. So the laws of electrostatics are appropriate here. The corporeal beings which were created—some of them anyway—were intended to be able to move around, in order that they combine and recombine. To permit such activity, there needs to be freedom of motion, but not absolute freedom. Things would be altogether too unstable if unlimited motion were to result from any trivial cause. So the law of inertia, and also that of friction, are most appropriately given to us.

The various laws of conservation may have been established by God so that the very existence of things would be a witness to His creative work, just as the very existence of the stones mentioned in several places in the Old Testament

was to be a witness of some mighty act of Gods. We know that matter, energy, etc., do not come into existence spontaneously. Since we know that they do exist, we should look beyond them to the Cause of their existence.

The second law of thermodynamics may not have been introduced until after the fall, as some suggest. It might be though, that God introduced it from the beginning, at least as it applies to heat, as a witness to the fact that the universe could not have existed forever, but must have had a start; and if a start, then a Starter. Even the laws of nuclear structure could have been given for a purpose. The world is to be warmed and lighted by the Sun, which, we believe, is kept hot and glowing by a nuclear reaction. Suitable laws of nuclear structure and behavior provided for this application (as we might call it); and maybe for others which are important to us, but of which we are now unaware.

Conclusion

It is clear that many other examples could be given. This point has been made sufficiently: God made the world, and He designed not only its outward appearance but also its manner of working, which we call the laws of nature. In the same way, when He established His people, Israel, he gave them appropriate laws. And the same is true of His new people, the Church; although, for several reasons, the giving of laws was not so prominent a part of His dealing with His Church. In all these cases it is clear: we should mark the laws, we should ponder on them, we should govern our actions by them; but most of all we should look beyond the law to the Lawgiver.

THE CREATION OF EVE

ROBERT F. KOONTZ*

In this short article the creation of Eve is considered in relation to contemporary knowledge of tissue culture, cellular differentiation, and chromosomal configurations. While nothing definite can be said regarding the mechanism of creation, the record and order of events is profoundly credible in terms of biology and theology.

The Creation Record

We are told in Genesis 2:21 that "... the Lord God caused a deep sleep to fall upon Adam, and he slept; and he took one of his ribs, and closed up the flesh instead thereof. And the rib, which the Lord God had taken from man, made he a woman, and brought her unto the man." This Biblical report of Eve's creation is far more credible than some critics have realized.

Obviously no detailed information is given in this passage about the processes by which God produced Eve from a rib. Therefore any discussion of actual mechanisms must be avoided as it would partake of pure speculation. But the miraculous creation operation itself may be considered against the background of contemporary knowledge.

Tissue Culture

Man is presently able to manipulate living human cells outside the body by an amazing technique known as "tissue culture." While these human tissue studies may have no direct bearing

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on the creation of Eve, they certainly do establish that even human beings can grow tissue explants outside a donor's body! Certainly no thinking person would deny God at least that much leeway in the creation of Eve!

The choice of a rib as the source of material for the creation of woman is especially interesting to a biologist. Many of the body tissues do not have the original number of chromosomes and as such could not serve as the basis for the creation of a new individual unless they were extensively reworked. Glandular tissue, for example, contains cells which have several sets of chromosomes in their nuclei, as they have become polyploid through repeated chromosome reproduction. Likewise nerve and muscle fibers become too specialized to offer great potential for further change. Red blood cells actually lose their nuclei upon maturation, and thus have no chromosomes at all!

But bone marrow is one of the tissues which contains relatively undifferentiated cells close to the original condition. Furthermore, certain bone marrow cells divide at a consistent and rapid rate, while most other cells in the adult body divide only very slowly or not at all. One might also add that bone is an organ which is near the surface and could be readily removed without serious or lasting consequences.

The Unity of Man

God's plan to create woman from a part of man has definite theological significance for the unity of the human race under Adam, as John Whitcomb, Jr., has pointed out¹. It is also obvious that creation according to the Biblical record would set forth a firm taxonomic basis for mankind as a biologic species. Thus the theological unity fits best with this obvious biological unity; and, Genesis 2 is the only adequate explanation for them both.

If Adam had been a variant among pre-hominids, as some theistic evolutionists prefer to believe, then there would have been no need for the special and miraculous creation of Eve. If an "evolved Adam" was simply the result of mutations, he could have mated with an individual of the original ancestral group. Members of following generations could have been "line bred" and selected to fix the new "human" characteristics in the same manner that stock breeders improve their animals today. Of course, thorough-going evolutionists propose just such

a scheme through the action of "natural selection." They say that man developed to his present status from an animal ancestry over a long period of time. In any such event, making Adam's mate from his own flesh would have been meaningless unless Adam himself had been created completely new and separate from other living forms. Thus theistic evolutionism is incoherent and falters on the origin of Eve.

Chromosome Configurations

Chromosomal biology may also be considered in relation to the formation of Eve. The male sex, which was created first, contains both the X and the Y chromosomes in each cell. A female or XX chromosome configuration could be understood as a repetition of one element found in the male—the X chromosome.

While this realization may shed no light on the actual mechanism of woman's creation, the facts certainly fit with the general creation order of man first and then woman—no matter how the result was accomplished. On the other hand, if a female had been the human being first created, then any new individual produced by replication of her cells would have naturally been XX or female (unless a Y chromosome were somehow introduced after creation). The production of an XX female from XY male tissue is profoundly reasonable from the standpoint of cytology.

Conclusion

Knowledge of tissue culture, cellular biology, and chromosomal sex determination in no wise detracts from the simple but accurate record of Eve's creation. Adam's words in Genesis 2:23 and 24 may be interpreted as the first love song. Adam was obviously delighted with the result of God's activity for in his song he referred to her as "bone of my bones, and flesh of my flesh." Eve, his legitimate wife, was especially "meet for him." Matthew Henry has said that:

... the woman was made of a rib out of the side of Adam: not made out of his head to rule over him, nor out of his feet to be trampled upon by him, but out of his side to be equal with him, under his arm to be protected, and near his heart to be beloved².

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BOOK REVIEW

Without Form and Void: A Study of the Meaning of Genesis 1:2 by Arthur Custance. 1970. Doorway Papers, Box 291, Brockville, Ontario, Canada. 211 pages. \$6.00.

Reviewed by John C. Whitcomb, Jr.* and Charles R. Smith.**

In the history of the interpretation of Genesis 1, there have been very few books that could be called "definitive." Within the school of thought known as the Gap Theory, there have been the works of Thomas Chalmers in 1814 and of G. H. Pember in 1876. Concepts of these writers have been enormously popularized in the footnotes of various editions of the Scofield Reference Bible beginning in 1917. Now, in the year 1970, we have a privately published volume by Arthur C. Custance, M.A., Ph.D., F.R.A.I., a Canadian scientist, which may well come to be considered as the definitive twentieth century defense of the Gap Theory.

Dr. Custance is to be commended for his refreshing insistence upon the absolute authority of the text of Holy Scripture and for his willingness to trust the statements of God's Word (such as the literal days of Genesis 1—pp. 106, 178), even if they apparently conflict with the claims of historical geology (pp. 3, 4, 116). Surely this must be the primary concern of God's people in the midst of the bewildering flux of scientific opinion and theorizing. "It is easier for heaven and earth to pass away, than for one tittle of the law to fail." (Luke 16:17)

The Tacit Elimination of Some Traditional Gap Theory Arguments

Dr. Custance is also to be praised for his objectivity and honesty in admitting that several of the most popular arguments used in support of the Gap Theory are not worth perpetuating. Consequently, in the on-going debate between advocates of this theory and advocates of its alternatives, we may now place these arguments into their final resting place.

First, the verb translated "replenish" in Genesis 1:28 "does not really mean to re-fill, but only to fill" (p. 8).

Second, Isaiah 45:18 does not really imply that the earth became a ruin (*tohu*) after an originally perfect creation. "To my mind," writes Custance, "Isaiah 45:18 is a strong witness only to those

who already accept the alternative rendering of Gen. 1:2" (p. 115), especially because the word *tohu* appears again in the following verse (Isa. 45:19) and can hardly be translated "ruin" in that context.

Third, Custance gives a left-handed compliment to those who appeal to 2 Peter 3:6 ("the world that then was, being overflowed with water, perished") as a proof-text for a Genesis 1:2 cataclysm, by omitting all discussion of this verse except to say that a certain Bishop Gleig, who had presented rather vague arguments in support of a catastrophe before Genesis 1:2 "might have found positive warrant in 2 Peter 3:5,6 which some believe applies more appropriately to the event under discussion than it does to the Flood of Noah's day" (p. 33). Dr. Custance's hesitation here is probably due to the embarrassing consideration that the Apostle Peter had already referred to Noah's Flood twice before (1 Peter 3:20, 2 Peter 2:5) and would hardly be expected to refer to a different flood without explanation, especially since the only flood Jesus ever spoke of was Noah's Flood (cf. Matthew 24:39; Luke 17:27).

Poor Support for Other Gap Theory Arguments

Dr. Custance does concede that the recurrent New Testament phrase, "the foundation (*katabole*) of the world," which Gap Theory advocates prefer to translate "the disruption of the world" because of its verbal root (*kataballo*, "cast down"), is never used in this sense in classical Greek or inter-testament literature and thus does not "constitute an unequivocal proof" of the Gap theory (pp. 93, 175-77). He frankly admits that "the great majority of Greek scholars would undoubtedly object to any claim that the noun can ever mean, 'destruction' on the grounds that 'there is no evidence for it'" (p. 177).

Nevertheless, Custance believes that such objection on the part of the scholars involves circular reasoning, since Olshausen preferred this translation for Hebrews 6:1 and there is "no evidence" for this translation only if one does not accept it! This is weak indeed, and such an approach would invalidate all lexical study.

Far more serious is Custance's failure to produce convincing support for the idea that "created" and "made" in Genesis 1:1-2:4 are basically different in meaning. It is upon this supposed distinction that the Gap Theory literally stands or falls, for if the verb "made" (*asah*) in Genesis 1:1-2:4 is contextually colored by, and therefore basically synonymous with, the more technical verb "created" (*bara*), then there can be no gap between Genesis 1:1 and 1:2, for

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Exodus 20:11 clearly states that "in six days Jehovah *made* heaven and earth, the sea, and all that in them is." Only by showing that the universe was "made" in the sense of being *reconstructed* (rather than *created*) in six days can any gap theory survive.

How does Custance support the all-important distinction between "created" and "made" in Genesis 1? In the first place, he claims that it is unlikely that the sun and the moon were not created until the fourth day since green things would hardly be brought into being before the sun was created. The reference in Gen. 1:16 seems more likely to refer not to a creation but rather to the *appointment* of the sun and moon as rulers of the Day and Night . . . (p. 178)

But if vegetation was created the day before (and Custance agrees that the days were literal—p. 178) it would hardly have perished in one day! Furthermore if the sun was created in Genesis 1:1, how could the earth have been shrouded in total darkness in 1:2? No cloud canopy could have excluded the sun's light, for water vapors were not elevated above the firmament until the second day of creation.

The second argument used by Dr. Custance to support this distinction is even more remarkable. Appealing to the long-rejected theory of Origen (3rd cent. A.D.), he concludes that "while both image and likeness were *appointed* (*'asah*), only the image itself was *created* (*bara*) by God, the achievement of the likeness being left as something to be wrought out by experience" (p. 180). Thus, we were *not* created in the image *and* likeness of God!! If this be true, then God could hardly have made man in His likeness in the same day He created him (Genesis 5:1)! Also, we wonder how Adam could have begotten Seth "in his own likeness" as well as "after his image" (Genesis 5:3). Obviously, the theory collapses under its own weight.

Especially serious is Dr. Custance's failure to deal with the most obvious problem which is raised by emphasizing a distinction between "created" and "made." In Genesis 1:21 we read that "God *created* the great sea-monsters . . .," while in Genesis 1:25 we read that "God *made* the beasts of the earth. . . ." Surely we are not to think that sea creatures were directly *created* on the fifth day, but land animals were merely *appointed* on the sixth day!!

Custance and all who hold that *bara* and *'asah* cannot be used of the same kind of activity are faced with a serious difficulty here. The difficulty is so severe that the Scofield Reference Bible, in support of this distinction, suggests that the beasts which were *made* on the sixth day (v. 25) were actually already *created* on the fifth

day ("Old" Scofield, note 1, p. 5; New Scofield, note 2, p. 2)!

Such an interpretation is impossible since the beasts are clearly brought into existence for the first time on the sixth day ("let the earth *bring forth*," v. 24). This bringing into existence is described as a work wherein God "*made* the beast of the earth" (v. 25)! On this basis alone, it is obvious that whatever shade of meaning the rather flexible verb "made" (*'asah*) may bear in other contexts of the Old Testament, *in the context of Genesis 1 it stands as a synonym for "created" (bara)*. And this fact, in the light of Exodus 20:11, is utterly devastating to the Gap Theory.

Major Objections to the Gap Theory Which Are Ignored

Dr. Custance does not propose to deal with all problems connected with the Gap Theory, but it is disconcerting to find him ignoring some of the truly major objections. In the first place, most advocates of the Gap Theory place millions of years of animal (and sometimes even "human") existence between Genesis 1:1 and the catastrophe of 1:2 (caused by the fall of Satan), and thereby find an explanation for the fossils of extinct creatures such as dinosaurs. But this is very difficult to reconcile with the perfection of God's creation as stated in Genesis 1:31 ("God saw everything that he had made, and behold, it was very good").

Are we to suppose that many kinds of animals had already become extinct during the millions of years of "struggle for existence" that supposedly preceded Adam's creation and over which he would never exercise dominion? The Gap Theory assumes that carnivorous and other animals were living and dying not only millions of years before Adam but even before the fall of Satan!

Could death have prevailed in the animal kingdom in a sinless world? Does not the Bible indicate that the "groaning and travailing in pain" of the animal kingdom is a result of the Edenic curse, which came *after* Adam's fall (Romans 8:20-22)? It was not Nature, or Satan, but *man* who was created to be king of the earth (Psalm 8, Hebrews 2:5-8); and not until *man* deliberately rejected the known will of God did death make its first appearance on this planet (Romans 5:12) or did animals fall under the "bondage of corruption" (Romans 8:21). It is at this point that the Gap Theory has seriously compromised the Biblical doctrine of man's original dominion and the doctrine of the Edenic Curse.

Another serious objection to the Gap Theory that Dr. Custance does not mention is its tacit assumption that Noah's Flood (to which Moses devotes three entire chapters) was of compara-

tive insignificance since all the major fossil formations were laid down by the supposed Flood of Genesis 1:2. Obviously, the same fossils were not deposited by two universal floods separated by many centuries! Therefore, Dr. Custance is willing to reject the universality of Noah's Flood to give full emphasis to a catastrophe before Adam (cf. Whitcomb and Morris, *The Genesis Flood*, pp. 5-6). We have already noted previously that the Lord Jesus Christ and the Apostle Peter put exclusive emphasis upon Noah's Flood, which strongly implies that that was the only universal flood set forth in the Book of Genesis.

A third major problem with the Gap Theory is that it leaves us with no clear word from God as to the original world!! When was it created? What was it like and what about the nature and history of its inhabitants? Instead of having the entire first chapter of Genesis on this vitally important subject, we are left with only the first verse! Are Christian people to assume that before Genesis 1:2 we must look to the uniformitarians and evolutionists to fill in the blank?

Finally, because all the plants and animals of the "first world" (of Genesis 1:1) were supposedly destroyed or fossilized, they could have had no genetic relation to the plants and animals of our present world. However, the vast majority of them appear to be similar if not identical in form to modern types. Likewise, those who would place some of the human fossils into this "gap" are forced to the conclusion that such pre-Adamic "men" did not possess an eternal soul, since they lived and died in a sinless world! (cf. Gleason Archer, *A Survey of Old Testament Introduction*, Moody Press, p. 188).

"Was" or "Became" in Genesis 1:2?

If the Gap Theory cannot make a great distinction between "created" and "made" in Genesis 1, and cannot come to grips with the perfection of God's creation, nor the genetic continuity of fossil and living creatures, nor the dominion of Adam, nor the uniqueness of the Edenic Curse, nor the universal catastrophism of Noah's Flood, it must be rejected by Bible-believing Christians. But Dr. Custance feels that *the really crucial question* is whether or not Genesis 1:2 can be translated "but the earth had become a desolation . . ." (p. 41), thus implying a tremendous transition from perfection to judgment and destruction.

But if none of the above-listed problems can be dealt with satisfactorily by the Gap Theory, it is difficult to see how a different translation of the Hebrew verb *hayah* in Genesis 1:2 could alter the picture at all. Nevertheless, to the student with a limited acquaintance with the Hebrew language it may in fact appear that he has proven his case. That is why in any serious

review of Custance's book a rather technical discussion of the Hebrew wording of Genesis 1:2 seems inevitable.

In the process of defending his view, Custance has done a considerable amount of "spade-work" in correcting some inaccurate or misleading objections to his theory. It is true that scholars sometimes quote each other's writing without checking the accuracy of their statements concerning statistical matters, such as counts of words, phrases, etc. The reviewers (with most other writers on the interpretation of Genesis 1:2!) must acknowledge guilt in this area, and on this account Dr. Custance is to be thanked for the painstaking work involved in his statistical approach.

The statistical approach used by Dr. Custance, however, may have contributed to what we believe to be the major fallacy of his book, namely, that the use of *hayah* throughout Scripture is more important for the solution of this problem than the grammatical construction of Genesis 1:2 itself.

The book is primarily a study of the usage of *hayah*, and the three major conclusions are: (1) the concept most commonly expressed by this verb is the idea of "becoming"; (2) the verb is most often omitted entirely where the mere "copulative" sense ("was") is intended; and (3) the placing of the subject before the verb often favors a pluperfect rendering ("had become").

To these conclusions it must be responded that as general statements which may *quite often* be applied to the use of this verb we must agree, but as specific statements applied to the usage in Genesis 1:2 these statements *cannot* apply. Even upon his presuppositions, Custance argues only that his translation is *possible* or *probable* and "deserves more serious consideration as an alternative" (his conclusion, p. 116). He writes for those "who do not expect in such questions as these to achieve absolute certainty" (p. 6).

His conclusion to the chapter titled, "The Linguistic Evidence," is that the verb "is not normally employed to express the simple copula" (except when the tense is future, p. 59). In fact, he mentions that Brown, Driver, and Briggs (in their famous Hebrew lexicon) cite 45 examples of such usage, but he objects that at least 23 of these are doubtful. This leaves 22 examples in this one listing which even on Custance's presuppositions are difficult to eliminate. (Example: "Joseph was a goodly person," Genesis 39:6.)

The "Existential" Idea

In this regard, it should be noted that the usage of the terms "copulative" and "existential" to describe verbal forms is often quite confusing

and is depressingly subjective. Custance denies that *hayah* is used in a "copulative" sense (p. 44), but in order to do so he must classify many apparently copulative uses as "existential." Genesis 2:25, which states that "they both were naked," since it cannot be translated "became naked," must be interpreted "existentially"—they "lived" or "went about" naked (pp. 44-45)! Similarly, Job 1:1, "There was a man," and Job 16:12, "I was at ease," must be understood "existentially"—"There lived a man," and "I lived at ease" (pp. 142-44).

The possibility of interpreting Genesis 1:2 "existentially," namely, "the earth existed," is briefly rejected in an appendix (pp. 152-53). The rejection is on the basis that the existential use would require (for an unexplained reason) a prepositional clause such as "in the land of Uz" in Job 1:1 (p. 152). To the (implied) objection that no preposition is employed in Genesis 2:25, he replies that this is because "naked" is an adjective instead of a noun (p. 152).

Again, it is difficult to see what difference this distinction requires, especially since adjectives often function as nouns. He does state in one place that when *hayah* "is used of a state it is given the rather special meaning of a deliberate continuation in that state" (p. 150). He apparently understands that this meaning exists only when *hayah* is associated with another verb.

We would argue that deliberate *existence* in a state is just the point of Genesis 1:2 (without Custance's emphasis upon "continuation") and that it is very difficult to distinguish this from the "existential" meaning. Also, though there is an appendix listing cases where *hayah* is used in connection with other verbal forms (pp. 150-51), full consideration is not given to the fact that this common usage does not support the concept that *hayah* only expresses change, since all these cases can only be translated with forms of the verb "to be."

The Word Order

With regard to the contention that the word order (subject then verb) argues for the pluperfect translation, Custance seems to have missed the point that such a construction is most often employed to signal the addition of *circumstantial* information and the *absence* of sequential development (Chapter 3). He does quote Driver to the effect that "the subject of the circumstantial clause is *placed first*," for the purpose of *breaking* a sequence, but he does not recognize that this prevents Genesis 1:2 from adding a chronological development to verse 1.

The insistence that such word order require a pluperfect rendering of the verb "become" (rather than the verb "be") requires him to under-

stand that Genesis 3:1 ("now the serpent was more subtle") must mean that there had been some change in the serpent since God created it, which made it *become* more subtle than the other beasts (like the *change* in Genesis 1:2!—p. 110). He gives a list of illustrations of these pluperfect readings on pages 72 and 73, but should have noticed that none of these introduces or adds a development chronologically subsequent to the action of the preceding context. (Most of his illustrations are properly introduced by the word "now.")

In this line of thought, Custance argues that Jonah 3:3 should be translated, "Now Nineveh had become a great city." He fails to realize that even if the pluperfect reading is accepted, the "now" means, "now at the time when Jonah *went* to Nineveh . . ." (the purpose of the circumstantial *waw* is to show this). To apply such a sense to Genesis 1:1-2 would produce the following theological monstrosity: "Now at the time when God created, the earth had become (already, **prior to its creation!**) unformed and uninhabited."

The Septuagint Translation

It has been mentioned earlier that the greatest weakness of this book is that it primarily presents a statistical analysis of the verb *hayah* and not a detailed exegesis of Genesis 1:2. With regard to the Septuagint translation (LXX), for example, Dr. Custance states that "The Hebrew scholars in Alexandria had no hesitation in equating" *hayah* with some form of the verb *ginomai* (p. 174). (This verb expresses the idea of *becoming* rather than the idea of *being*.)

To this it should be responded that the LXX translators often properly translated *hayah* with *ginomai*, but did *not* so translate it in the case of Genesis 1:2. It should be presumed, as is the case, that there is a reason for the varying translation, but Custance chooses to charge the translators with a theological or philosophical bias which required a departure from their "usual" translation (pp. 76-78)!

The "statistical" approach is here evident: It is noted that the verb *hayah* occurs 27 times in Genesis 1. In 22 of these the LXX has employed some form of *ginomai*, and four are imperatives where a form of *eimi* (or *einai*) is used (as in verse 6, "let there *be*"). To Custance's thinking, this leaves only Genesis 1:2 as an instance where the translators, for apologetic reasons, chose to depart from their "normal" translation and incorrectly used a form of *eimi* (*en*, meaning "was," *not* "became")!

The basic mistake which Dr. Custance makes here is his failure to note the significance of the Hebrew *waw* which introduces Genesis 1:2. In his brief remarks on the *waw* he states that "the

Hebrew *waw* . . . has an almost unlimited number of meanings, so that one may adopt the meaning most suitable to the sense without doing any injustice to the Hebrew original" (p. 66), and "context alone can determine which is more appropriate" (p. 41).

A Circumstantial Clause

The facts are that the Hebrew *waw* has several distinctive uses which are distinguishable by the type of words with which it is compounded, and by vocalization. Therefore one is not limited to the "context alone" (meaning interpretation) to determine its meaning. Custance himself mentions the *conversive waw* which is attached to a verb (pp. 61-62). This type of *waw* is used in the continuation of a narrative to add chronologically or logically consecutive events to the narrative account. It might often well be translated "and then." This is the type of *waw* which introduces most of the verses in Genesis 1 (v. 3, "And then God said"; v. 4, "And then God saw," etc.), but is not the type of *waw* which begins verse 2.

Another important usage of the *waw* is the *circumstantial waw* (also variously called a conjunctive *waw* because it adds circumstantial details, or a disjunctive *waw* because it does not continue a narrative sequence). The *waw* which begins Genesis 1:2 is such a *waw*. It cannot be confused with a *conversive waw* because it does not occur on the verb but on the subject. (It is also vocalized differently in the Massoretic text.)

The translators of the LXX realized that this is not a *conversive waw*, employed for adding sequential development, but is a *circumstantial waw* employed to add non-sequential circumstances. Forms of *ginomai* are quite appropriate in translating forms of *hayah* which follow a *conversive waw*, but would be quite incorrect for forms following a *circumstantial waw*.

It should be noted that the LXX translators were extremely accurate in their translation of the Pentateuch. They translated the *waw* in Genesis 1:2 with *de*, "now," and all the other *waws* in Genesis 1 with *kai*, "and." The interested student could quickly determine that following Genesis 1:2 the next occurrence of a *circumstantial waw* is in 2:6. Verse 5 tells us that vegetation was able to thrive without rain and irrigation. Then verse 6 is added to explain the circumstance which made this possible: "Now there went up a mist. . . ."

The third usage of the *circumstantial waw* is in Genesis 2:10. Verse 9 describes the garden

with its pleasant vegetation, and then verse 10 gives the circumstance which made this possible: "Now a river went out of Eden to water the garden." The fourth usage is in Genesis 2:12. Verse 11 mentions the land of Havilah, where there is gold, and then verse 12 adds the circumstance: "Now the gold of that land is good."

The LXX translators consistently employed *kai* to translate all the preceding *waws* in Genesis, but in these four cases only, the only cases where *circumstantial waws* occur up to this point in the text, they employed *de*. It may be asserted with authority that the *circumstantial waw* introducing Genesis 1:2 is *not* introducing an event chronologically subsequent to the event named in Genesis 1:1. The LXX was correct in translating the *waw* by *de* and the form of *hayah* by *en* ("was," not "became").

Hebrew grammars could be cited in abundance to the effect that a nominal clause (with no verb or else with a form of *hayah*) as in Genesis 1:2, is the normal way to describe a *state of being* without any verbal activity or change of state. Zechariah 3:1-3 presents a construction very similar to that found in Genesis 1:1-2: "And then (consecutive *waw*) he showed me Joshua . . . Now (circumstantial *waw*) Joshua was clothed with filthy garments." Dr. Custance would undoubtedly translate, "Now Joshua *had become* clothed . . .," but even if this were allowed, such a change would have to be prior to his being *shown* to Joshua, and when applied to our Genesis passage would again require the earth becoming void **before** it was created!

Conclusion

Dr. Custance is to be commended for a thorough (though sometimes disorganized) presentation of what is undoubtedly the best possible defense of the Gap Theory. Honestly admitting that several of the traditional supporting arguments are weak, but strangely omitting any discussion of the major Biblical and theological objections to the Gap Theory, he "puts all his eggs into one basket," namely, the translation of *hayetha* in Genesis 1:2 as "had become" instead of "was." But even here, Dr. Custance has failed to prove his point!

It is doubtful that anyone will be able to add to his argument. The weaknesses of the book are not so much due to the weaknesses of his presentation but rather to the basic errors of the theory he supports. It seems fair to conclude that if this is the best that can be done for the Gap Theory of Genesis 1:2, it will some day be only a memento in the museum of exegetical foibles.

LETTER TO THE EDITOR: A REPLY TO BOOK REVIEW

Comments in this letter are in reply to the review of my book undertaken by Prof. John C. Whitcomb and Dr. Charles R. Smith in the C.R.S. *Quarterly* for September, 1971.

The summary nature of my reply has been dictated by my conviction that ultimately the best assessment of a thesis is in the reading of it, and I can only urge those who would like to know both sides to read the volume side by side with the C.R.S. *Quarterly* review and come to their own conclusions.

Paragraph 7*: I regret that somewhat more space in the review has been allocated to a rebuttal of what I considered some less important issues which I had put outside the basic thesis into Appendices. I did this, for example, with the question of the significance of the N.T. phrase "from the foundation of the world," which I suggest might with some justification be translated "from the *disruption* of the world." I do not think the matter is crucial to my thesis, though of some interest.

Paragraph 9: Although the reviewers find it a thorny question, my own feelings regarding Exodus 20:11 may be judged by the fact that I have made my treatment of it also an appendix and not part of the main thesis. Had Exodus 20:11 read "For in six days God created the heavens and the earth, etc.," there would be no equivocation. That the word *create* has not been used appears to me of significance, and I would not equate the two words (in the original) for *create* and *make*. I am by no means alone in this.

The argument of the reviewers against my view here seems to me to be presented in a rather unfortunate way—though no doubt unintentionally. If one allows that the word *make* in Hebrew has more of the idea of "appointment" rather than of origination, there are really no problems in understanding where it either parallels or replaces or accompanies the word *create* in certain passages. Many elements in the economy of God were first created, and then given their special appointment within this economy. I do not find in any of its occurrences the problems of interpretation which the reviewers find, least of all in Genesis 1. I do not believe and have never suggested that the Universe was reconstructed in six days. I am talking about the earth and its immediate atmosphere. One should not be criticized for views one does not hold!

*EDITOR'S NOTE: Numbers refer to paragraphs which have been numbered consecutively as they appear in the Whitcomb and Smith review of *Without Form and Void* published elsewhere in this issue.

Paragraph 11: I feel that some of the objections to it raised by the reviewers are somewhat artificial. The darkness over the face of the earth could be due to some sort of blanket shielding it from the sun's direct light. Darkness may be a sign of judgment, and can at times be supernatural. One does not need to attribute it to those water vapours which on the second day were set above the intervening atmosphere.

Paragraph 12: "The long-rejected theory of Origen" may well be, and is, a still-accepted theory for many people. Who determines officially when a "theory" has been long-rejected: and by what percentage of rejectors is it officially so? This paragraph of the critique strikes me as being entirely *non-sequitor*.

Paragraph 14: I do not agree entirely with Schofield's note regarding the reconstruction though my personal opinion is of little importance to anyone else: but there is surely no reason at all why something should not be created one day and then appointed to its appropriate position in the total economy thereafter when certain other measures had been taken. I would not suspect the Word of God of looseness in its terminology particularly in such an extraordinarily precise statement as we have in the Genesis account of Creation. The "serious difficulty" which the reviewers found, may not be and has not been felt by other equally careful students of Scripture.

To interpret the text so that *create* and *made* must mean the same thing in Genesis 1, then to convert this interpretation into a "fact," and finally to say that this *fact* is "utterly devastating to the Gap Theory" will not prove a convincing argument to many who have learned to distinguish between interpretation and fact.

Paragraph 16 is titled "*Major Objections*" and begins with a discussion of paleontology. I did not, for my purposes, consider that the findings of paleontology are of prime importance to a discussion of what is intended by the Author of Genesis 1:2. I have therefore rigidly excluded all such purely scientific considerations from the book. This part of the review does not therefore properly relate to the thesis presented in my work and I shall not attempt any reply.

If one wanted to be facetious one might ask, however, whether herbivorous animals ate anything during the days or hours of Adam's innocence: and if they did, whether they were careful not to eat any microbes (by accident of course) that happened to be on the leaves. Or did they not perhaps tread on some and kill them—ants

for instance-albeit unwittingly? Is it possible indeed for vegetable matter to be sought and eaten at all without the death of some life? Does not the digested leaf die? Surely life is found everywhere, and not just in the larger, more immediately visible creatures.

Personally, I do not see that death is in any sense a *punishment* in the animal (or plant) kingdom. It is for man; and since punishment became necessary when sin entered, death was introduced for man, only when he sinned (Romans 5:12). The passage in Romans 8:22 is not as clearly a reference to the whole animal creation as is often assumed since, in the Greek, “the whole creation” is a phrase which occurs elsewhere only of human society. It appears again in Mark 16:15 in the great commission—“to every creature.” It appears in Colossians 1:15 where the reference is equally clearly to the *human* race, and in Colossians 1:23 “to every creature” where the reference is clearly the same. It is not altogether just to take a phrase like this and use it to invalidate a thesis unless one tells the otherwise uninformed reader that an entirely different interpretation is not only possible but more likely

Paragraph 19: Peter’s reference (II Peter 3:4) may have nothing to do with Noah’s Flood. It is not unequivocally identified as such: and there is no reason at all why it may not refer to a prior catastrophe. We may feel convinced that this is a reference to Noah’s Flood, but it certainly is only one possible interpretation. What is reasonably certain to one person is clearly (by the reviewers’ reaction to my book!) not equally certain to others.

Paragraphs 20 and 21: I do not think the former creation needed to form any great part of revelation. I entirely agree with Dr. Henry Morris that in matters of this nature, God has taken care to give by revelation what we could not discover for ourselves by natural enquiry. The fact of the creation of the Universe by the God of the Old Testament, and in the beginning—this required revelation. It may well be all that we need to have revealed to us. The rest, in so far as it seems to us important to know it, may have been left to our own intelligent devices.

In my view, it is not an essential part of my thesis that geological ages prior to the re-constitution of the earth occupied billions of years or only a few hundreds. It is *not* the subject matter of my book. Nor do I believe that the catastrophe necessarily destroyed all life As to placing human fossils in the Gap, I have *never* suggested it in any of my writings or lectures so that it is hard to see why the reviewers introduced the issue.

In **Paragraphs 22 and 23** we come to the nub of the issue. And here apparently the reviewers feel that the issue hinges not so much on the Hebrew original but upon whether the “above-listed problems” can be dealt with. Such problems as the introduction of death into human experience, pre-Adamic men, whether II Peter 3:4 refers to the Flood of Noah’s time, whether the Hebrew word *made* is to be equated with the word *create*, whether the recurrent N.T. phrase “the foundations of the world” is correctly rendered, whether we have enough revealed data regarding the origin of the Universe, and so on.

I am disturbed to feel that these are the lines of evidence which are to determine how Scripture is to be read: geology, biology, astronomy, cosmology, and anthropology. This is the impression one gains from the review at first. Only after setting the reader’s mind in *this* direction do the reviewers really deal with the basic issue, the linguistic one. In my view the crucial issue is the meaning of the original Hebrew of Genesis 1:2.

In **Paragraph 25** the question is: which is more important, the meaning of *hayah* in Scripture as a whole or the grammatical construction of Genesis 1:2. I view them as equally important. A whole chapter is devoted to the latter question—enough, I felt, to cover the matter adequately for both the expert and the less than expert reader.

Paragraphs 27 and 28: It is strange to be chided for not being dogmatic!

Paragraph 29: What the reviewers have failed to do here is to acknowledge that those scholars who have made the most thorough study of the copulative use of the verb *hayah* have concluded that it is difficult to find cases of such a use in the whole of the O.T.; some authorities would even say *impossible*, not merely difficult. Such studies as these men have made can hardly be dismissed merely by not making any mention of them!

Paragraphs 30 thru 32: When an argument is closely woven and for many readers breaks new ground and is inherently difficult to present in any case, it is comparatively easy to make it look silly. Rather than attempt to answer these paragraphs, I prefer to trust that the serious student will read the book and form his own conclusions firsthand.

Paragraphs 33 thru 35: I share the reviewers’ belief that Genesis 1:2 does provide “circumstantial information.” It is the whole point of Chapter 3. I have not “missed the point”; I have devoted 15 pages to it.

Surely if the subtlety of the serpent has a sinister element to it (which seems to me rather

obvious in the context) one should not assume that this creature had this "nature" as it came from the hand of God! It had become so . . . This, to me, seems an entirely reasonable view. As to the reference to Jonah 3:3, I prefer to leave it to the reader to decide what is meant here. To me, the meaning is clear enough, "at the time Jonah visited Nineveh it had become a great city."

Similarly, in Genesis 1:2 at the time that the writer has in mind, as he sets out to describe the reconstitution of the earth, it had become a ruin. To attribute to me the suggested rendering of Genesis 1:1 and 2 is entirely unjustified. I do not accept it at all . . . And have not implied it in my book in any instance where Genesis 1:1 is quoted. Nor do I believe "unformed and uninhabited" is in any sense a *translation* of TOHU VA BOHU in the Hebrew!

Paragraphs 38 thru 38: The reviewers admit that "the LXX often properly translated *hayah* with *ginomai* (become) . . . but did not so translate it in the case of Genesis 1:2." In Genesis chapter 1 they rendered *hayah* by *ginomai* in 22 cases out of 27 and in 4 of these exceptions did not do so because the Hebrew was in the imperative and required some other word. There are at least 1500 cases where the LXX rendered *hayah* as *become*, *became*, etc., and they thus showed clearly that the equation was considered perfectly reasonable. It is not a rare or occasional practice. When they departed from it, there are sometimes manifest reasons, but the reasons are *not* always apparent. They were inconsistent at times, in one sentence using "became" and in the very next sentence using "was," in spite of identical Hebrew originals. Whether the tense was imperfect or perfect made no difference.

Paragraphs 39 and 40: The use of *waw* is sufficiently complicated in certain circumstances (*waw* conversive, *waw* consecutive, etc.) and is still being so argued back and forth among the experts that in a volume which has attempted to reach both the scholar and the ordinary reader, a full discussion would have been out of place. It is still essentially true that in an English translation the context is probably the best and only way to determine which is more *appropriate*.

Paragraphs 41 and 42: The point here is lost, for me, because I have nowhere said that the *waw* of Genesis 1:2 is a conversive *waw*, though a whole chapter in the book is devoted to the word order in this verse. So it is hard to see why the reader should be invited to imagine that I hold a view on this which I have set out deliberately to say I do not hold! The *waw* is disjunctive.

The final sentence in paragraph 42 is the nearest the reviewers came to repeating an old argument that LXX does not render *hayah* as "became" when it is in the perfect tense. They do. Many examples can be given, though unfortunately the issue never occurred to me when I wrote the book. But of the list on page 163, 38% of the cases illustrate how the LXX rendered the perfect of *hayah* as "became," and the list can be expanded easily. It is, in short, not true to say that "the forms of *ginomai* . . . are quite incorrect for forms following a circumstantial *waw*." It is possible that there is some subtle grammatical rule governing their use of *ginomai* in such a case, but I do not know of any grammar which has yet unraveled it.

Paragraphs 43 and 44: The LXX did *not* translate the *waw* of Genesis 1:2 as "now." They rendered it *de*, it is true. But "now" is not the usual English translation of *de*. Liddell & Scott give "but" as the prime meaning. "It is used to call attention to the fact that the word or clause with which it stands *is to be distinguished* (their emphasis) from something preceding." Thayer says that it is "a particle, adversative, distinctive, disjunctive . . . it is added to statements opposed to the preceding statement . . . it opposes things previously mentioned or thought of." This is exactly my point.

Whether, in view of this, the LXX can be considered as "extremely accurate" in their translation of Genesis 2:10 and 2:12, the reader must decide for himself.

Conclusion: I think one has to accept the fact that we are still dealing with a subject about which there are areas of uncertainty in the matter of *translation*. My object was to show that a great deal of what has been said about the alternative proposed in my book is really without adequate foundation. The view was held very anciently, as shown in Chapter 1, and was in no way "invented" to escape the challenge of modern geology. The Jewish people read the text in this way in some of their oldest commentaries and instruction manuals. Furthermore, many authorities have stressed that the verb *hayah* has a primary meaning which signifies *change*, and seldom if ever was employed in Hebrew in a purely copulative way. The issue is still an open one, and I suggest that this approach should not be dismissed too lightly. The Christian public has a right to know the whole picture.

Signed,
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COMMENTS ON SCIENTIFIC NEWS AND VIEWS

HAROLD ARMSTRONG*

Teilhard the Piltdown Hoaxer?

The affair of the Piltdown man continues to stimulate comment. A recent commentator tells that he met a Mr. Essex, one of the workers on the excavation. Essex agrees with Leaky and Thompson that Teilhard de Chardin, not Dawson, arranged the fraud.¹ It is reported that:

. . . Essex saw the various finds both at the site of the pit and in Dawson's office. . . . He was certain that certain of these had been switched en route, prior to Dawson's inspection. . . . Even at the time of the discoveries the treated orangutan jaw could have been distinguished . . . the staining of the jaw was only superficial . . . a careful examination . . . might have exploded the hoax very early . . . Sir Arthur Smith Woodward did not allow ready access to the jaw and thus the affair dragged on. . . .

How clear hindsight can be! We can see now how flimsy the evidence which was supposed to be almost Exhibit 1 for evolution really was. But may we be warned thereby? We have been told that there will be things which, if it were possible, would deceive the very elect. Is it possible that some of these things will, in some way, have to do with "science falsely so called"?

Whence. Neanderthal?

When the remains that came to be called Neanderthal man were found, Virchow suggested that they showed, not an early place in the evolutionary tree, but a bad case of rickets. Apparently all that Virchow got for his insight was abuse. It has been pointed out recently, though (as was mentioned in these columns), that Virchow was probably right.

Now another suggestion has been heard.² It is said, in fact, that the peculiarities of the remains could indicate syphilis. Such a suggestion seems to call for two comments.

In the first place, it would appear that any of several quite different causes could account for the peculiarities of the Neanderthal remains. But if any of the various possibilities could be the true cause, so could any of them be a false cause. In other words, it would seem that no very certain conclusions can be drawn.

In the second place, if the diagnosis of syphilis is the correct one, is it too wild a speculation to wonder whether the remains might date from before the Flood? Generally venereal disease is widespread in times of moral decline; is it likely that it was thus "in the days of Noah"?

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Tropical Animals Acclimatize Easily

In the last few years, a number of zoo keepers in the temperate regions have found that tropical animals can live out of doors in quite cold winter weather, with a little acclimatization.³ This matter is mentioned here for just one reason. Some of us may use this knowledge in thinking about the acclimatization and other changes that likely went on immediately after the Flood.

Uniformitarian Catastrophists

Some staunch uniformitarians see the need to bring in a catastrophe by the "back door" every now and then. A recent suggestion of this sort concerns the extinction of the dinosaurs.⁴

It is suggested that a supernova might have come close to the Solar System—as distances go between stars—and that the explosion may have served as the catastrophe (either directly by radiation or indirectly by its effect on the climate). Of course, there is no independent evidence whatsoever for such a thing.

The only direct evidence that can be alleged even for evolution comes from fossils, and the fossils of dinosaurs are perhaps about as complete a lot as we can find. Now if these fossils are the result of a catastrophe, is it not likely that others too may have originated thus? But how can a uniformitarian conclusion be drawn from a catastrophic record? It would be like trying to draw an affirmative conclusion from negative premises in logic. And if a catastrophe is to be admitted, the Scriptural one is at least as plausible as any other, and it has some independent evidence—which the others have not.

Among all kinds of animals, reptiles have suffered most from extinction. Is it possible that the serpent in Genesis can be considered more generally as a reptile (I believe that there is no separate Hebrew word meaning just "reptile"), and that the curse pronounced on it fell, to some extent, on the whole reptile kind? We can notice, in particular, that there are no mammals which crawl without legs, snake-fashion.

Barrenness of Evolutionism

It is surprising, yet encouraging, to see in a journal like the *New Scientist* outright criticism of the theory of evolution. A recent letter says, in part:

. . . the Theory of Evolution is no longer with us, because neo-Darwinism is now acknowledged as being unable to explain anything more than trivial change, and in default of some other theory we have none . . . despite the hostility of the witness provided by the fossil record, despite the innumerable

difficulties, and despite the lack of even a credible theory, evolution survives . . . can there be any other area of science, for instance, in which a concept as intellectually barren as embryonic recapitulation could be used as evidence for a theory?⁵

It is admitted that the reason why many are attracted to the theory is that they dislike admitting that God has taken an active part in the happenings in the-world.

One is reminded by all this of the story of "The Emperor's New Clothes" (see article on that topic by Dr. John N. Moore, June C. R. S. *Quarterly*, Annual Issue, 1971.) Have we reached the stage at which, the child having pointed out the obvious, the whole crowd of bystanders is beginning to murmur: "But the Emperor is wearing nothing."

Competition or Stable Coexistence?

Darwinian evolutionists have always wished to make much of "competition." For their "survival of the fittest" has to suppose that some do not survive, and competition is supposed to account for that. It has always seemed, to an unprejudiced observer, that the competition might not be all that drastic. Now some evidence has been reported to show that kinds, presumably in competition, can live together indefinitely.⁶

Experiments were carried out, in which numbers of vinegar flies of the two species *Drosophila willistoni* and *D. pseudoobscura* were kept in enclosures, where they were presumably in competition. It never happened, though, that one kind would be eliminated; they would come to equilibrium, the two kinds being in a more or less fixed ratio. It was considered that the kind that ended up with greater numbers was "fitter"; but the notion of fitness here would seem to be entirely *a posteriori*. Anyway, the conclusion is that: ". . . stable coexistence of the two species in spite of their competition for limited resources . . ." is what happens.

The notion of "frequency dependence" is used. It seems to mean that the losses which a kind undergoes are proportional to (or at least depend on) their "frequency," i.e., their relative numbers. Certainly if both kinds were caught more or less indiscriminately by predators, that would be true. It does not seem to be so clear that it would happen also when resources are limited; but this study seems to show that at any rate the result is the same.

Although the current brand of Darwinism seems to play down the emphasis on competition, it is hard to see how it can get along without something of the sort. For if mutations are appealed to, they will still be quite rare; and if the individual bearing the mutation has no advan-

tage over his unmutated fellows, the mutation will surely be lost in the shuffle. Everyone can think of variations which occur now and then, but which show no tendency to become anything but rarities.

As a matter of fact, a little thought might long ago have cast doubt on Darwin's notions about competition, especially his example of the giraffe. For, if we look around, we see that the most plentiful animals are not those which seem to be almost invulnerable. Nay, more, many such, e.g. the sabre-tooth tiger, have long since become extinct.

The plentiful animals are of such sorts as rabbits. While rabbits are well adapted to their way of life, they have really only one great advantage—their rapidity of multiplication. This is not the kind of thing which Darwin envisioned (maybe he dared not, since it would have been at cross-purposes to his Malthusian ideas).

In fact, one could argue that the rapidity of multiplication would have been a disadvantage, in the hard times during which the giraffes are alleged to have stretched their necks. (It could be argued, e.g.: "better a few strong offspring than many weak ones, etc., etc., etc.") But we see that rapid multiplication seems to cause a kind to prosper, as a kind.

Is this not what one might expect, based on Scripture? For God commanded the animals to multiply and fill the Earth. Is it not likely that those that best obey that commandment (which is the only commandment that was given to them of which we are told), would prosper best? Where this leaves the attitude, of which so much is heard today, that seems to look upon every birth as a calamity, may be left to the reader's consideration.

In any event, it is plain that the studies of kinds living together provide no support for Darwinian theories.

Symbiosis—A Stumbling Block to Evolutionists

When Donne said: "No man is an island . . .", he could have extended it to: "No organism is an island." For we see that some kind of symbiosis (to use the word in its literal meaning), some kind of living together with others, is universal. The creatures, both animals and plants, which do live and interact with others, have many peculiarities which are of use in their way of life, and one of these is the production of chemicals which play some part in their way of life.

The article cited is too long to be condensed here. Since *Science* magazine is readily available it will suffice to call the work to readers' attention. An enormous number of references, some of which might be useful, is given. I was inter-

ested to read that certain plants put out chemicals into the surrounding soil, to reduce the competition from other plants. For some symbiosis can be cooperative; some competitive; some, doubtless (like the "symbiosis" of businesses), a bit of both.

It seemed to be found necessary to have the word "evolution" here and there in the article. But evidence was not adduced to show that any of the cases of symbiosis ever evolved, nor was any explanation proposed of how they might have done so.

Clearly symbiosis sets up a "*pons asinorum*" for evolution. For by the evolutionist's own doctrine, the partners once did not exist. Thus the special features, which fit them to live together, must have come into being at some time. But how? Not in the (alleged) way in which the giraffe's neck is supposed to have done so; there are many cases in which the symbiosis seems hardly advantageous, and certainly not essential.

Mutations? but several matched mutations would have had to come about in two different creatures at the same time. Surely such a thing is beyond all belief. No, God has chosen the foolish things of the world to confound the wise; and plants and ants, by their way of life, can confound the theory that seems, sometimes, to be set up as the pinnacle of wisdom.

Unexpected Atmospheric Activity

It has been reported that the atmosphere, above about 200 kilometers, rotates more quickly than the Earth itself by 25% or so; the result being that, at those altitudes, there is, on the average, a wind from west to east, at something like 100 meters per second.⁸ The evidence for such a state of affairs comes mainly from the orbits of artificial satellites. The reason seems to be still unknown, although it is suggested that it may be from an electro-magnetic effect, the Earth's magnetic field influencing the motion of ions.

This matter would be of little interest to us except for one thing. Here is a phenomenon in which a part of the atmosphere, at a considerable altitude, acts in a very unexpected way. Now many of us hold that there was once another part of the upper atmosphere which may have been somewhat unexpected in its behavior; viz.: the canopy. It may be that the evidence from this unexpected motion of the upper atmosphere can give us some notions about how the canopy worked, in the times when there was a canopy.

Radiogalaxies and Oceans Shorten the Time Scale

It has been noticed in this publication, from time to time, that there is much evidence from

astronomy to show that the universe cannot be as old as the uniformitarian theorists would have it.

More of such evidence has appeared.⁹ Studies of the radiogalaxies, it is reported, show that:

... the evidence for cosmological evolution of radiogalaxies is now stronger, and the shortness of the time scale of this evolution (10^9 years) compared with the typical ages of galaxies poses a serious problem for the conventional view of galactic history . . . this . . . conflicts either with long established views about galactic history or with the most widely supported cosmological models.

The evidence offered is a rather long story, and cannot very well be condensed here. Anyone who can get this article would be interested also to see the comments on page 368 of the same issue.

Of course, we believe that 10^9 years is far too long. But we may be able to find something of use to us, in work of this sort. For the differences in times show up as so many contradictions, or at least difficulties, in the evolutionary theory. And, as Aristotle mentioned long ago, difficulties in one theory can serve as evidence in favor of a rival theory. (Not that we consider Creationism a theory, in the sense of an unproven suggestion. But if a theory is something for *theoros*—a spectator—a spectator's aid, so to speak; in fact, a viewpoint, in that sense Creationism can be a theory, and a valuable one.)

* * * * *

Recently, there was a remark, in the editorial part of *Nature*, that: "... oceans . . . now appear as young features with comparatively simple geology and with histories far less complex than that represented by the contortions of the continents. . . ."¹⁰

Only in the last few years have the bottoms of the oceans been studied extensively. It was not, of course, the intention of the author of the work referred to, to support the Creationist position in these matters; yet this evidence does fit in with the belief, which many of us hold, that the oceans, to a great extent, may be only as old as the Flood.

Investigation of the bottom of the ocean is going on very extensively now. It will be worth our while to watch to see what more evidence may turn up.

Cell Water in Polarized Multilayers

It is a commonplace that water is a very important constituent of living beings, at least of all those known. Some studies have suggested that the behavior of this water is, though, peculiar in some respects.¹¹ It is suggested that:

the entire water in the living cell exists in polarized multilayers"; or, at least, that the water in biological systems is different somehow from water in the natural environment.

It is not surprising that something of this sort should turn up. For everything that we find out about living beings, and about the cells that go to form them, shows us how complex they are. But may we not draw at least two conclusions from this information?

Does this not show us another obstacle to the alleged spontaneous generation of living things from lifeless matter? For presumably this odd disposition of the water is necessary to the cell, or at least advantageous. But it apparently needs a cell to bring about such a state of affairs. Surely no "proto-cell" in a primitive ocean ever found the water neatly arranged in multilayers for it.

Does this information not also make it seem even less likely that there might be, elsewhere in the Universe, "living" beings which would not depend on water? There is no evidence that ammonia, or whatever else might be supposed to replace the water, would be capable of any such favorable arrangement into multilayers. Living things were designed, they did not come about by chance; and they were designed for the Earth.

Irregularities of Venus

The planet Venus has been a source of continuing embarrassment for astronomers. At first it was believed that Venus always had the same side toward the Sun. Only within the last few years has it been shown fairly conclusively that Venus has days and nights, albeit long ones. Once Venus used to be spoken of as "Earth's twin sister," but it now seems clear that conditions on the two planets are vastly different.

Now another difficulty which Venus presents for the uniformitarian viewpoint has been pointed out.¹² It is assumed that Venus started out

with a direct spin, not retrograde as it is now; and that, like most planets, rotated once in ten to twenty-four hours. What, then, brought about the present state of affairs? Tidal friction is easily seen to be vastly inadequate.

The suggestion is offered that maybe the rotation was altered by a collision with a satellite, or some such object but there is no independent evidence whatsoever for such an event. (Incidentally, Mars, which has many craters that could have been caused by collisions, has about the same rate of rotation as the Earth.)

All this provides another example to show that the strictly uniformitarian theory simply is not sound. It has to be propped up with catastrophes here and there. But there is no difficulty in believing that when God created the planets He set them moving as seemed good to Him.¹³

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THE ARK OF NOAH

HENRY M. MORRIS*

Physical features of the ark described in Genesis 6 are considered in this paper. Such factors as buoyancy, water displacement, weight, and metacentric height are expanded with appropriate calculations. It is concluded that this craft was eminently suitable for preserving man and animal during the year of the great Flood.

Purpose of the Ark

The Biblical record of the great Flood is quite explicit in describing it as a world-wide cataclysm. Its purpose and effect were, in God's own words, to:

destroy man whom I have created from the face of the earth; both man, and beast, and the creeping thing, and the fowls of the air. (Genesis 6:7)

The destruction was universal, so far as land animals were concerned. "All in whose nostrils was the breath of life, of all that was in the dry land, died." (Genesis 7:22)

rather than for movement through the waters. Assuming the cubit to be 1.5 ft., which is the most likely value, the dimensions of the Ark were 45 ft. x 75 ft. x 450 ft., as sketched in Figure 1, to a scale of 1" = 100'.

The Ark was obviously a very large structure, taller than a normal three-story building and half again as long as a football field. The total volumetric capacity was $450 \times 45 \times 75 = 1,518,750$ cubic feet, or 56,361 cubic yards. Since the standard railroad stock car contains 2,670 cubic feet effective capacity, the Ark had a volumetric capacity equal to that of 569 standard stock cars.

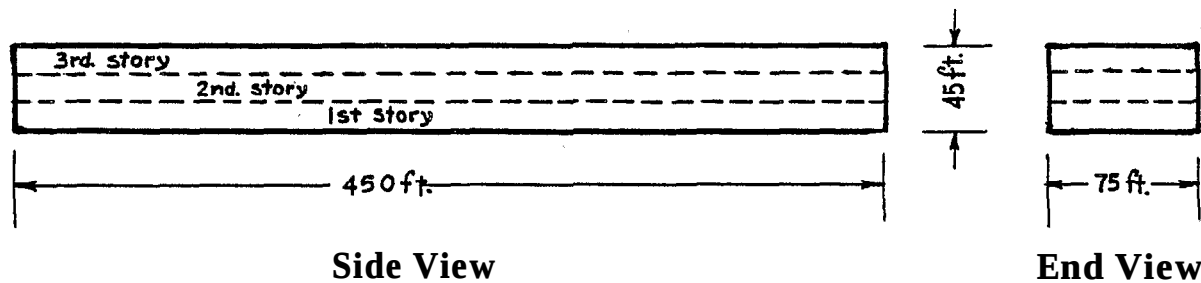


Figure 1. Dimensions of Noah's Ark.

However, in order to preserve two of each kind of animal, with which to re-populate the earth after the Flood, as well as Noah and his family, God gave directions for the building of the Ark.

"Make thee an Ark of gopher wood," He said, "rooms shalt thou make in the Ark, and shalt pitch it within and without with pitch. And this is the fashion which thou shalt make it of: The length of the Ark shall be three hundred cubits, the breadth of it fifty cubits, and the height of it thirty cubits. A window shalt thou make to the Ark, and in a cubit shalt thou finish it above; and the door of the Ark shalt thou set in the side thereof; with lower, second and third stories shalt thou make it." (Genesis 6:14-16)

Size of the Ark

The Ark was thus to be essentially a huge box (the Hebrew word itself implies this), designed essentially for stability in the waters of the Flood

It obviously could have carried a tremendous number of animals, and was clearly designed to hold representatives from all kinds of animals throughout the entire world.

Stability of the Ark

In the complex of hydrodynamic and aerodynamic forces unleashed in the Flood, it was necessary that the Ark remain afloat for a whole year. The gopher wood of which it was constructed was no doubt extremely strong and durable.

Timbers forming the sides and bottom, as well as the floors of the intermediate decks, were probably cut and shaped from great trees that had been growing since the world began, over 1600 years earlier. The "pitch" (Hebrew *kaphar*, meaning simply "covering") was evidently an excellent waterproofing material, though we do not now know what it was.

In addition to floating it must not capsize under the impact of the great waves and winds which might beat against it. The Scripture says the floodwaters rose at least 15 cubits above the highest mountains (Genesis 7:20), evidently to

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point out that the Ark was floating freely wherever the waters might propel it. The height of the Ark was 30 cubits, so it seems probable that the 15 cubit figure represents the draft of the Ark when loaded.

When the Ark was floating at this depth, Archimedes' principle tells us that its weight must have equalled the force of buoyancy, which in turn equals the weight of the equivalent amount of water displaced. The weight of the Ark therefore was

$$W = 450(75) \left(\frac{45}{2} \right) (w)$$

where w is the weight of each cubic foot of water.

Fresh water weighs 62.4 lbs. and sea water 64 lbs. per cubic foot. Because of the minerals and sediments in the water, its density may well have been at least that of sea water, in which case the weight of the Ark would be calculated at 48,600,000 pounds; this is close enough for practical purposes.

The average unit weight of the Ark must then be half that of the water, or 32 lbs. per cubic foot. The center of gravity of the ark and its contents presumably would be close to its geometric center, with the framework, the animals, and other contents more or less uniformly and symmetrically dispersed throughout the structure.

Two Tests of Stability

The Ark as designed would have been an exceptionally stable structure. Its cross-section of 30 cubits height by 50 cubits breadth, with a draft of 15 cubits, made it almost impossible to capsize, even in the midst of heavy waves and violent winds.

To illustrate this, assume the Ark tipped through an angle such that the roof was actually touching the water's edge, as sketched in Figure 2. This is an angle of approximately 31° , that is the angle whose tangent is 30/50. Since the weight of the Ark continues unchanged, it must still displace an amount of water equal to half its cross-section. Thus the water surface coincides with the diagonal. The buoyant force B continues to equal W , the weight of the Ark.

However, the two forces are not now acting in the same line. The weight W acts vertically downward through the center of the Ark's cross-section. The force B acts vertically upward through the centroid of the triangle LQN , since this is the location of the center of gravity of the volume of water that has been displaced by the Ark. The two forces W and B , equal in magnitude but opposite in direction, form a *couple*, of intensity equal to the product of either force times the distance between them.

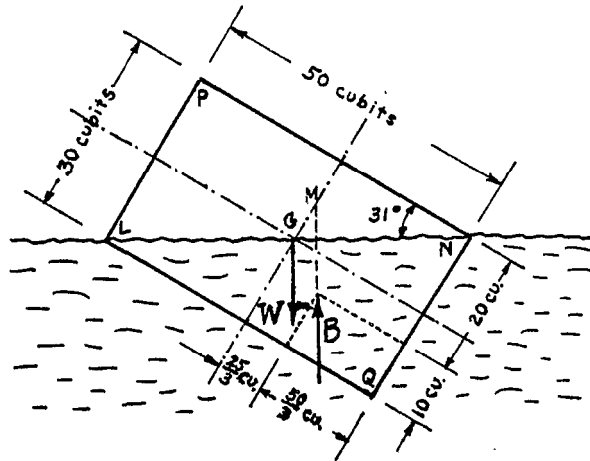


Figure 2. Stability of Ark at 31° angle of tilt.

As long as the line of action of B is outside that of W , in the direction toward the submerged side of the Ark, the couple is a "righting couple" and would act to restore the vessel to its upright position. The magnitude of the couple is of no particular interest, but the location of M , the *metacenter*, is significant. As long as M is above G (the centroid of the entire vessel cross-section) on the axis of symmetry of the vessel, then the ship is stable.

For the condition shown, M can be calculated to be 8.9 cubits above G on the axis of symmetry (calculated, from dimensions shown on the sketch, as $\frac{25/3}{\tan 31^\circ} - 5 = \frac{125}{9} - 5 = \frac{80}{9}$ cu.). This is almost 13.5 ft. above the centroid and indicates the Ark was extremely stable, even under such a strong angle of listing. The righting couple is then equal to $8.9 (\sin 31^\circ) (W) = \left[\frac{80}{9 \sqrt{34}} \right] (48,600,000) = 222,000,000$ ft.-lbs.

As a matter of fact, the *metacentric height*, as the distance GM is known, is positive for this cross-section even for much higher angles. Suppose the boat, for example, were tilted through a 60° angle, as shown in Figure 3. The centroid of the immersed area is obviously to the right of the line of action of G , and thus there is a righting couple and the metacentric height GM is positive.

As a matter of fact, the Ark would have to be turned completely vertical before M would coincide with G . Thus, for any angle up to 90° , the Ark would right itself.

Furthermore its relatively great length (six times its width) would tend to keep it from being subjected to wave forces of equal magnitude through its whole length, since wave fields tend to occur in broken and varying patterns, rather

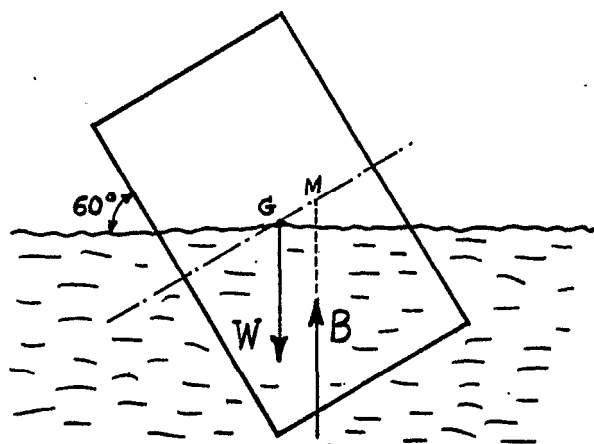


Figure 3. Stability of Ark at 60° angle of tilt.

than in a series of long uniform crest-trough sequences, and this would be particularly true in the chaotic hydrodynamic phenomena of the Flood. Any vortex action to which it might occasionally be subjected would also tend to be resisted and broken up by its large length-width ratio.

The Ark would, in fact, tend to be lined up by the spectrum of hydrodynamic forces and currents in such a direction that its long axis would be parallel to the predominant direction of wave and current movement. Thus it would act as a semi-streamlined body, and the net drag forces would usually be minimal.

In every way, therefore, the Ark as designed was highly stable, admirably suited for its purpose of riding out the storms of the year of the great Flood.

ARTICLE REVIEW

"Carlsbad Caverns in Color," by Mason Sutherland (in) *National Geographic Magazine*, CIV: 4:433-468. October, 1953.

Reviewed by Robert Harris.*

. . . The Rock of Ages is the most celebrated formation in the caverns.

Because of its huge bulk this stalagmite was popularly supposed to be one of the oldest decorations. Actually there is no good way of determining its exact age; no one can tell when it grew or how fast (p. 463).

Little seems to be known about the growth rates of dripstone; most authorities are content to indicate vaguely that the process is a slow one. Attempts to determine deposition rates through uniformitarian methods (the present is the key to the past) have been unsuccessful.

Comparing the growth of stalactites under concrete bridges with the Carlsbad formations has failed because of the highly variable conditions of deposition. Mineral concentration, speed and volume of water flow, and atmospheric conditions must be taken into account. *Encyclopedia Britannica* states:

Conditions which favour dripstone deposition of calcium carbonates are (1) a source rock above the cavity; (2) downward percolation of water supplied from rain; (3) tight but continuous passageways for this water which determine a very slow drip; (4) adequate air space in the void to allow either (a) evaporation or (b) escape of carbon dioxide from the water which thus loses some of its solvent ability.¹

Applying uniformitarian suppositions to the cavern formations themselves is also unreliable because not only is 95 percent of the caverns dry and inactive at the present, but also the most active formation, Crystal Spring Dome, is not growing at a constant rate. (In spite of the present dry New Mexico desert above, one day's measurement put the rate at 2.5 cubic inches per year in 1953 [p. 455].)

Although the author muses about the possibility of a guano deposit being "perhaps a million years old" (p. 452), he does admit that even by uniformitarian dating, "Few of these . . . [dripstone] formations can exceed 100,000 years, for many rest on silt and fossils believed to be of that age," (p. 446).

The most interesting and revealing picture in the article, which may give a clue to growth rates, is on page 442, showing the clear outline of a bat cemented upside down in a stalagmite! Due to bacterial decay and scavenger attack, it seems unlikely that a bat's body would last several thousand years before entombment in calcium carbonate. Rather it would appear that very rapid growth would be required—perhaps even catastrophic growth.

Much study into cave phenomena is needed. The power of crystallization is strong enough to defy gravity, allowing helictites to grow in any direction; perhaps further research will disclose that possible growth rates are likewise amazing by virtue of rapidity.

Reference

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¹*Encyclopedia Britannica*, 1970 Edition, Vol. 21, page 104.

DIE ENGLISH LANGUAGE IST FUNNY

WILLIAM J. TINKLE*

An educated German planned to visit America. He said, "I have studied English so mooch, fen der Americans talk to me I can say, "Ich fershtay; but I must say it in English, I understand."

When the German got off the train at his destination the conductor called, "All aboard." "Pardon me," he asked of another passenger, "fot does dot mean?" "Oh, it means that it is time for the people waiting here to get on the train."

Starting from the train, a fellow-passenger said, "Walk on the board."

"Und does board now mean sometings else?"

"It means if you step on this plank you keep out of the mud."

"Danke. Fer can ve find one restaurant?"

"A block farther along is a good place. By the way, is board very expensive in your country?"

"Another board? Fot you mean?"

"Oh, I mean, not like the other boards, this is what one eats."

"Board—get on train; board—one plank of holz, ach, wood; board—what you eat. Die English language ist funny! Ich fershtay nicht. Ach, I do not understand." The companion tried to explain, but the German was bored.

This incident sets me to thinking about academic degrees. When Manchester College conferred the Bachelor of Arts degree there was some logic in it, for I was not married; but not an artist either.

The Master of Arts was inappropriate, for by that time I had learned enough to know I was not a master of anything. It is a person who knows just a little who gets a swell head.

When the Ohio State University called me a Doctor of Philosophy they were far off the beam; for I majored in zoology, not philosophy, and if I should doctor anybody he would be sure to die.

To cap the climax, last Sunday Indiana Christian University dubbed me Doctor of Laws. What in the world do I know about law? I will admit that when I think of my daughter, son, and three grandsons I appreciate the degree Pa. Furthermore, in summer, I wear BVD. Die English language ist funny.

Now for the serious side of this piece. A few weeks ago a letter of contempt by William Hines appeared in many newspapers, alleging that the Creation Research Society is but a group of 300 obscure scientists. We maintain, however, that we have our share of academic degrees, and also our share of biographies in *American Men of Science* and even in *World Who's Who in Sci-*

ence. The latter volume lists all the noted scientists who ever lived. Come on, you evolutionists, if you want to match cards with us we are ready!

Now, the following letter is the forceful and accurate answer of our president to this unfounded charge:

(Copy of a letter sent in reply to the newspaper article)

November 20, 1970

Mr. William Hines

Universal Science News, Inc.

516 Travis Street

Houston, Texas 77002

Dear Mr. Hines:

A friend has sent me a copy of your recent column on the Creation Research Society. In this column, you inadvertently made a number of incorrect or misleading statements about the Society which reflect unfavorably on your column. As President of the Creation Research Society, I hope you will, in fairness, publish these corrections in an early future column.

The erroneous statements are as follows:

(1) The Creation Research Society is not based in California, but in Michigan. Neither was the John Birch Society fostered in California, but in New England. (I am not a member of the latter and know little about it, but that much is common knowledge.)

(2) The Creation Research Society is strictly a research and publication society, holding no meetings and engaging in no lobbying or political activity whatever. We publish a quarterly journal of research articles on scientific creationism, all written by qualified scientists with the standard academic and scientific credentials. We have also recently published a high school biology textbook, written by a committee of qualified biologists and other specialists. A copy of the publisher's advertising is enclosed for your information as well as a brochure on the Creation Research Society.

(3) The Creation Research Society as such had nothing to do with the California textbook decision, nor with similar efforts by citizens' textbook groups in other states. Individual members of C. R. S. of course are free to participate in such activities if they wish, but they do so as individuals and not as representatives of the Society. In the California action, most of the concerned parents and others who were instrumental in obtaining the favorable decision were not C. R. S. scientists.

*William J. Tinkle, Ph.D., is a retired geneticist, and lives in Eaton, Indiana.

(4) The C. R. S. "sustaining members" do not "bankroll" any activities of the Society. Both the voting members (men with a graduate degree in a natural science) and non-voting members pay only the annual dues of \$7.00, which covers merely the subscription cost to the journal. There is also a research fund and a textbook fund, both of which are small and are financed by gifts designated by interested individuals for either research activity or textbook preparation. There is no fund for lobbying or any other activities, because we engage in no such activities.

(5) The scientists in our Society are no more "obscure" than those in any other scientific society. All have graduate degrees in science from recognized universities, many are teaching on university faculties (I myself served on the faculties at Rice, Minnesota, Virginia Polytechnic Institute and others; at V.P.I., I was Head of a large engineering department for 12 years), many have extensive lists of significant publications, etc. Our total scientific membership of around 350 compares favorably with that in many other scientific societies.

(6) It is not true that only a "few-hundred bemused laymen" are concerned about the teaching of evolution in the public schools. There are millions of fundamentalist Christians in scores of Christian denominations in this country who believe in the divine origin and accuracy of the Bible, including the Genesis account of creation, and they deeply resent the takeover of our public school system by the evolutionist "establishment."

(7) The theory of evolution is neither more "scientific" nor less "religious" than the theory of creation. Both deal with the subject of origins and of non-reproducible events of the past. Neither creation nor evolution (in the sense of transformation from one basic kind into another) can be observed as taking place today, and therefore neither is "scientific" in the sense of studying observable and reproducible events. The basic processes of the present, in fact, are processes of

conservation and decay (in accord with the two universal laws of thermodynamics) rather than of origin and development, as the evolutionary hypothesis supposes. Evolution is based on faith, rather than scientific proof, and therefore is simply a religious philosophy. The fact that more scientists are evolutionists than are creationists is basically a matter of religious preference. It is significant that scientific creationists are always answered only by ridicule, as in your column, and never by considered scientific argument. The facts of science overwhelmingly point to creation, rather than evolution, but evolutionists refuse even to discuss the matter on its scientific merits, preferring instead to confuse the issue by referring emotionally to Galileo, the Scopes trial, and similar irrelevancies.

(8) The fundamental Christians in California and other states who are concerned about this matter are not trying to ban evolution from the schools or from textbooks, but are only asking that scientific creationism be included as an alternate theory. No mention need be made of the Genesis record of creation at all—only the legitimate scientific evidence that supports creationism, as well as the legitimate scientific evidence contradicting evolutionism (of which there is an abundance). It is unconstitutional, discriminatory, unscientific, and contrary to academic freedom to do otherwise.

If you are interested in further documentation of the above points, I would be happy to send you some of the wealth of material that is now available. I should also mention that the Creation Science Research Center, with which I am now connected, was organized only three months ago and has no connection with the Creation Research Society.

Thank you very much for reading this letter and for any clarification of this matter which you may be willing to print in your column.

Sincerely yours,
HENRY M. MORRIS

PROPOSALS FOR SCIENCE FRAMEWORK GUIDELINES

HENRY M. MORRIS*

General

In the restricted and proper sense, *science* consists of the collected and correlated data of observation and experimentation on presently observable phenomena. Science, as the name itself implies, means *knowledge*, and the essence of the scientific method is experimental reproducibility and verification. Thus, the science of chemistry deals with chemical processes, the science of biology with biological processes, and so on.

In this restricted sense it is evident that the subject of origins is entirely outside the scope of science proper. Unique historical events cannot be repeated for scientific measurement and description.

The origin of the universe, the origin of the earth, the origin of life, the origin of the major "kinds" of organisms (e.g., families, genera, and even most species), and the origin of man are phenomena which are not occurring in the present world, so far as scientists can see, and therefore are not amenable to the scientific method. It is misleading and false, therefore, to teach that "science" has proved anything whatever about origins or even about other events in the distant past antedating human records.

Nevertheless it is not really satisfactory to teach science without any reference to origins. In principle it would of course be possible to do this; that is, physics could be taught merely as a description of physical processes and how things work, geology could be taught merely as a description of the earth's crust and its present geological processes, and so forth. However, man by nature wants to know the "why" as well as the "how," the explanation as well as the description, and this desire inevitably and quite legitimately brings up the question of origins.

It is certainly desirable, therefore, to incorporate a discussion of origins into any science course—indeed into any subject whatever—since both the fundamental understanding and the practical application of the data in any field will surely be functions in some degree of one's basic philosophic commitments. Nevertheless, it should never be forgotten that, when origins are considered, the teacher or textbook must necessarily leave the realm of true science and enter the realm of philosophy and even of faith.

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Theories of Origins

Although each has many variants, there are really only two basic theories of origins. These are both equally "scientific," in that they attempt to explain the origin and nature of the data of science, and equally "religious," in that these ultimate answers they seek are necessarily beyond the reach of the observational and experimental techniques of the scientific method. It is therefore intolerable in a public institution in a free society for either one of these theories to be labelled "science" and the other "religion." If either is taught, then both should be taught, and the evidences for and against each should be fairly and impartially presented.

If a particular textbook author or teacher is so committed personally to either of the theories that he really cannot present the other in a fair manner, then a system of dual authors and dual teachers may be indicated. The latter would neither infringe on the academic freedom of the teacher on the one hand, nor on the civil and religious liberties of the children and their parents on the other hand. The cost of textbooks would not be affected and teachers could be scheduled to share various classes in such a way that teaching budgets need not be increased. In any case, it is obvious that the only course consistent both with the various federal and state constitutions and with relevant court decisions is to devote equal time for impartial presentation of both theories of origins in any course in which any discussion of origins at all is included.

The two basic theories of origins are of course the evolutionary and the creationist theories. In the first, the ultimate explanation for all entities in the universe is to be found in terms of the processes and relationships innate to the universe itself, developing itself by means of its own properties into its present structure.

The creationist theory of origins, on the other hand, maintains that the universe could not have originated and developed itself but, rather, that its fundamental cause must be transcendent to its present processes and structure. It does not in any sense deny the scientific validity of these phenomena, but merely says that they could not have originated themselves and that, therefore, they must be explained in terms of unique creative processes which functioned in the past but are no longer operative at present.

Although both of these theories are fundamentally philosophical, rather than scientific, certain scientific techniques may be used in analyzing and comparing them. Science works in terms

of "models," and each proposed model is evaluated in terms of its effectiveness in correlating the available data. A decision between alternative hypotheses will always be statistical, rather than absolute, and this is especially true for hypotheses of origins. These two theories are henceforth called, in this paper, the Evolution Model and the Creation Model.

It is recognized that some have attempted to formulate a mediating hypothesis of some kind, by which it is hoped that evolution and creation can *both* be accepted. That is, perhaps evolution was the *method* of creation. The tenability of this type of compromise can best be considered after the two basic models are first evaluated. In any case, it is certainly true that many evolutionist scientists and many creationist scientists alike reject this idea.

The consistent evolutionist insists that, if indeed innate evolutionary processes suffice to explain all the data, as he believes they do, then there is no need to invoke extraneous creative processes. The creationist says that, since there is a need to postulate extraneous creative acts and processes to explain the data, as he believes, the Evolution Model is by that very fact rendered impotent. These two theories cannot really be harmonized, except at a very superficial level, since they really represent diametrically opposite philosophies of origins.

The Evolution Model

The present processes of nature are, in the Evolution Model, adequate to explain the origin of the universe and its development into its present immense degree of variety and complexity. Despite occasional failures and even retrogressions, the over-all effect of these innate principles and processes has been that of the rise of diversity and complexity from primeval simplicity. The processes of the cosmos, therefore, are fundamentally processes of origination and integration.

Since, according to this model, all things are inter-related by common descent through slowly-operating innate processes, certain *basic predictions* can be made from the model as a test of its validity:

(1) innumerable structural and functional similarities should be observed among the entities of the present world, with in fact a more or less continuous array of inorganic species, semi-organic transitional species and organic species, and with no "gaps" of any consequence between adjacent kinds;

(2) the basic processes which have presumably given rise to all things should, when observed in the present world, turn out to be processes which tend to develop new entities in an ever-higher state of order and integration;

(3) if it is possible to decipher the actual history of the earth, it should be found that the variety and complexity of the world and its inhabitants tend to increase as time increases.

Support for Predictions Only Apparent

These three predictions are supported to some degree by the observed data. Many types of similarities are observed between different organisms, for example—similarities in anatomy, in embryonic development, in genetic biochemistry, in blood serology, etc.

However, the inference of a continuous array of such similarities, with no gaps of any consequence between adjacent kinds, is not supported by the data. Although certain hypotheses might be offered to explain the existence of the great gaps between all the basic kinds, these hypotheses are not accessible to experimental test and thus do not give any genuine scientific explanation for this obvious deficiency in the Evolution Model.

Secondly, study of earth's processes does bear out the evolutionary inference that many changes continually take place in the world. In the organic world, for example, new varieties and even new species are easily developed through the mechanisms of hybridization, induced mutation and selection, and these phenomena may occur either naturally or artificially. No two individuals are alike, even with the same parents, and there is obviously a great deal of variation and change taking place in the world.

Once again, however, this evidence in itself is not very compelling, since these processes of change are not innately processes tending toward increase of order as predicted. On the contrary, they seem always to fall into one of two categories:

(a) variation within relatively small limits leading merely to new varieties within a basic kind;

(b) mutations which represent random changes in the D.N.A. of the germ cells, resulting almost always in decreased order within the germ cells.

These two phenomena seem actually to support better the principles of conservation and decay, rather than origination and integration, as the evolutionary model would suggest. These observational fallacies in the theory have not to date been overcome by any measurable facts, although evolutionists feel justified in extrapolating these small variations into the general theory of evolution.

Again, Basic Facts Deny Prediction

The inference that the complexity of life should have increased with the passage of geologic time does seem at first to be substantiated by the fossil record, and indeed this evidence from paleontology is undoubtedly the strongest of the evidences for evolution. However, it is seriously weakened by the necessity of circular reasoning in its development. That is, the scale of geologic time must essentially be based on the assumption of evolution in the first place.

The relative dating of the geologic formations is always determined mainly by the "index fossils" which they contain, and their supposed absolute dating by radioactive minerals is always subject to correction by these paleontologic criteria. Furthermore there are many, many locations where fossils from different "ages" are found in the same beds, and even where entire formations containing "old" fossils are superimposed vertically above formations containing "young" fossils.

This argument is still further weakened by the obvious fact that most of the fossiliferous rocks, especially those containing fossils of large plants or animals, must have been deposited and lithified rapidly, even catastrophically, or else the fossils would not have been preserved at all. Thus the fossil record does not necessarily speak of slow, uniformitarian evolutionary development over vast ages, but rather provides a graphic record of violence and death on a worldwide scale.

Although some of the data could possibly be interpreted in an evolutionary framework, this interpretation is not at all compelling. The Evolution model contains numerous deficiencies and discrepancies. One may adhere to it as an act of faith, but it is fallacious and misleading to label it "science."

The Creation Model

The Creation Model postulates a period of special creation in the past, when the world was brought into existence out of nothing except the power of the Creator. All of the basic physical entities were perfected and all the basic biologic kinds established, each with its own specific form and function.

These basic units are now being "conserved" rather than "created." The present processes of nature are therefore not creative (or evolutionary) processes at all, but rather "conservative" processes, which serve to maintain the essential integrity and stability of the universe as created.

This does not mean of course that no change or variety is possible. To the contrary, the Creation Model postulates that a tremendous complex of inorganic and organic variants can be develop-

ed from the basic created entities. However, such variation will always be within the limits imposed by the initially created structure of each entity. In the biologic realm, for example, many new varieties (or even species or genera, depending on terminology) may quickly be developed in response to environmental constraints, but never a new basic 'kind.'

In addition, the Biblical version of the Creation Model notes the establishment of a universal principle of decay and death (though not annihilation) in all the world, at some time after the creation period. Finally it records a great worldwide cataclysmic Flood at a still later date, which radically changed the face of the earth, as well as the nature and rate of action of most earth processes.

Specific Predictions Are Confirmed

The above features are confirmed by most or all of the actual observed phenomena of nature, thus demonstrating the validity of the Creation Model as a well-founded scientific theory, even though no theory of origins can be fully verified by science.

The two most basic and firmly established scientific principles are the First and Second Laws of Thermodynamics. These apply without exception to all scientific disciplines and may properly be regarded as confirmed predictions of the Creation Model. That is, the First Law (Conservation of Mass-Energy) supports the prediction that nothing is being created or annihilated in the present order of things, since the creation was completed and perfected at some time in the past and is now merely being maintained.

Similarly the Second Law (Increasing Entropy) is essentially a confirmation of the universal law of decay and death postulated by the Biblical Model.

The permanence of basic "kinds" is supported without exception by all observed biologic data. Thus, a population of moths may change colors because of a change in the smoke content of the atmosphere, but they remain moths. A thousand successive generations of fruit-flies may be exposed to radiations and other mutagenic influences, with the production of a wide variety of mutants, but they still are fruit flies.

The great gaps between basic kinds are likewise to be expected, since each has its own created purpose and, therefore, a structure uniquely designed with that purpose in view. On the other hand, many similarities would likewise be expected, since it is reasonable that, when similar functions are to be performed in similar environments, even different "kinds"

would be designed with somewhat similar structures.

As far as the fossil record is concerned, it is well known that essentially the same gaps between basic "kinds" exist in both the fossil record and the present biologic world. There are, of course, many extinct kinds, as well as extinct varieties of present kinds, found in the fossils, but few if any of these can be considered as transitional forms between any of the established kinds.

Sedimentary Layers Relate to Cataclysmic Flood

Furthermore, the Biblical Model, with its cataclysmic Flood, predicts that such fossil deposits should be found in sedimentary beds all over the world. In fact, there seems no way of accounting for most of the great fossil beds of the world, especially of vertebrate fossils, except in terms of very rapid burial and lithification, such as posited by the Biblical Deluge, with its accompanying volcanic and tectonic activity and its inferred subsequent glaciological phenomena.

The order of succession of fossils is predicted by the Biblical Model to be from the simplest at the bottom to the most complex near the top, though with numerous statistical exceptions to this rule. That is, the hydrodynamic action of moving water is a highly efficient sorting agent and would tend to segregate its sedimentary contents into aggregations of similar sizes and shapes, normally depositing them in nicely stratified layers. Hydrodynamically the simplest (i.e., most nearly spherical) and densest would tend to settle out first and thus be buried deepest.

Further the simplest organisms tend to dwell at the lowest elevations and would therefore tend to be deposited at the lowest elevations. Finally, the more advanced organisms are the more mobile and would therefore survive flood waters

longer and consequently be trapped and buried at the higher levels if at all.

These would be statistical criteria only, of course, and many exceptions would be anticipated in the context of a universal aqueous cataclysm lasting an entire year (and, in lesser intensity, for centuries). Both the expected normal sequences and the occasional exceptions are found as predicted in the geologic column all over the world.

Summary and Conclusion

There are two possible models of origins, the Evolution Model and the Creation Model, though each may have several variants. Both are fundamentally religious in nature, since they deal with ultimate meanings and are both incapable of scientific proof. On the other hand, both are scientific in the sense that they provide frameworks of prediction for comparative evaluation of the present phenomena of nature.

On this basis, the Creation Model provides a basis of interpretation and correlation which is at least as satisfactory as the Evolution Model. The two Laws of Thermodynamics, the apparent stability of the basic "kinds," the existence of great gaps between the kinds, the deteriorative nature of mutations, and the catastrophic nature of the worldwide fossil-bearing formations all correlate far more easily with the Creation Model than with the Evolution Model.

Furthermore the data and principles of physics, chemistry and the other physical sciences are much more easily understood within the framework of the Creation Model than in the Evolution Model.

Nevertheless, many people prefer the latter as a matter of faith. Therefore it should be included along with the Creation Model as an alternative in any textbook or course dealing with origins, in the public schools.

CONSTITUTION AND BY-LAWS OF CREATION RESEARCH SOCIETY*

(ADOPTED APRIL 17, 1971)

Article I — Name and Purpose

Section 1. The name of this organization shall be the Creation Research Society.

Section 2. The chief purpose of this organization shall be to publish research evidence supporting the thesis that the material universe, including plants, animals, and man, are the result of direct creative acts by a personal God.

Section 3. The Society shall also publish reviews and interpretations of scientific literature bearing on the problem of the origin of the universe and of the living world. It shall also, within the limitations of its financial resources, support research on these problems.

Section 4. The corporation shall be organized exclusively for educational and scientific purposes; and no part of the earnings of the corporation shall inure to the benefit of or be distributed to its members, trustees, officers, or other private persons, except that the corporation shall be authorized and empowered to make payments and distributions in furtherance of its purpose. No substantial part of the activities of the corporation shall be for propaganda or otherwise attempting to influence legislation.

Article II — Statement of Belief

Section 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.

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

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

Section 4. We are an organization of Christian men of science who accept Jesus Christ as our Lord and Savior. 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 mankind. Therefore, salvation can come

only through accepting Jesus Christ as our Savior.

Article III — Membership

Section 1. All members of the Society shall subscribe to the statement of belief contained in Article II and may continue to hold membership only so long as they subscribe to the Statement of Belief and pay dues.

Section 2. Membership shall be divided into two classes. Voting membership is limited to scientists having at least an earned graduate degree in one of the natural or applied sciences. Sustaining members are those who do not meet the criteria for voting membership. Sustaining members shall have all rights and privileges except those of voting and holding office.

Article IV — Organization

Section 1. Members of the Board of Directors shall be voting members of the Society.

Section 2. The Board of Directors shall be elected by the voting members for a term of three years with one-third of the members of the Board of Directors elected annually. They shall serve without compensation.

Section 3. The officers of the Society shall be elected annually by secret ballot by the Board of Directors from their own membership and shall serve without compensation.

Section 4. The officers of the Society shall constitute the executive board and shall be empowered to act for the Society between annual meetings of the Board of Directors.

Section 5. All officers and directors shall serve until their successors are elected and qualified.

Section 6. Except as provided in the By-laws, the president shall appoint the necessary boards and committees. These shall serve without compensation.

Section 7. There shall be no executive secretary.

Article V — Meetings

Section 1. A meeting of the Board of Directors shall be held annually at a time and in a place designated by the Board of Directors.

Section 2. All meetings shall be conducted according to the rules and regulations set forth in Robert's "Rules of Order."

Section 3. Special meetings may be called by the president on the authority of a majority of the Board of Directors, provided that the time and the place of the meeting is announced to the Board of Directors at least a month in advance

*Editor's Note: Comparison of this revised Constitution with the original published in C. R. S. *Quarterly*, 3(1):3, will demonstrate that Board members have strengthened (not weakened) the stand of the Creation Research Society.

of the special meeting. The announcement shall also indicate the subject for discussion at the special meeting, and only this subject shall be discussed.

Section 4. A majority of the Board of Directors shall constitute a quorum at the annual meeting. Those present at a special meeting shall constitute a quorum.

Article VI — By-Laws

Section 1. The Board of Directors shall from time to time adopt By-laws as are necessary for the conduct of the affairs of the Society.

Article VII — Amendments

Section 1. Any article or section, of the Constitution, except for Article II, Statement of Belief, may be amended at a regular meeting of the Board of Directors, providing that the wording of the amendment is reported to the voting members at least three months in advance of the meeting. To be adopted the amendment must be favored by two-thirds of the members of the Board of Directors. Voting on the amendment shall be by secret ballot.

Section 2. Article II, Statement of Belief, shall not be amended or changed in any fashion.

Article VIII — Dissolution

Section 1. If it becomes necessary or desirable for the Society to dissolve, the then current Board of Directors shall designate some college or university which is interested in continuing research along creationist lines, as the recipient of any and all remaining assets and properties of the Society.

BY-LAWS

Article I — Officers

Section 1. The officers of the Society shall consist of a President, Vice President, Secretary, Membership Secretary, and Treasurer.

Section 2. The duties of these officers shall be those usually assigned to the office.

Article II — Board of Directors

Section 1. The Board of Directors shall consist of 18 members.

Section 2. The Board of Directors shall appoint the Editor of the Society's *Quarterly*. He shall serve for a period of three years and may be reappointed.

Article III — Election of Directors

Section 1. The date for the annual election of directors shall be set by the Secretary, but in no case shall it be later than March 1.

Section 2. The Board of Directors shall annually nominate at least one candidate for each vacancy on the Board of Directors, said candidate to have agreed to serve on the Board of Directors. The secretary shall report the names of those nominated by the Board of Directors together with the date of the election to all voting members not less than 120 days prior to the election.

Section 3. Any voting member may nominate one candidate for election to the Board of Directors by presenting a petition signed by not less than 25 voting members of the Society, said petition to list the name and address of the candidate, indicate the qualifications of the candidate in not more than fifty words, list the name of the individual nominating him, bear the certification of the nominator as to the authenticity of the signatures on the petition, and contain a statement by the nominator that the individual nominated is willing to serve on the Board of Directors. This petition must be mailed to the secretary and must be postmarked not less than 60 days prior to the election. On receipt of the petition, the secretary shall ascertain that at least 25 of the signers of the petition are voting members in good standing.

Section 4. The secretary shall mail a ballot to every qualified voting member of the Society at least 30 days in advance of the election. The ballot shall indicate which candidates have been nominated by the Board of Directors, which have been nominated by petition, and which candidates are incumbents. He shall list the qualifications of those nominated by petition and may at his discretion list the qualifications of all nominees.

Section 5. To be counted in the election ballots must be postmarked not later than the date of the election.

Article IV — The Society Quarterly

Section 1. The Society shall publish in its *Quarterly* only news items, items related to the business of the Society, and articles and papers which deal specifically with scientific aspects of creation and catastrophism in keeping with the Society's statement of belief.

Article V — Additions and Amendments

Section 1. Additions to the By-laws may be made and the By-laws may be amended by a two-thirds vote of the Board members present at a regular meeting of the Board of Directors, provided that notice of the proposed addition or amendment is sent each Board member at least one month in advance of the meeting.

REPORT OF BOARD OF DIRECTORS MEETING

The annual meeting of the Board of Directors this year was marked by a full agenda and long sessions. The meeting was called to order by President Henry Morris, at 6:40 P.M., April 23, 1971, at Concordia Lutheran College, Ann Arbor, Michigan. We engaged in silent prayer. Board members present were Henry Morris, Larry Butler, George Howe, William Tinkle, Richard Korthals, Wilbert Rusch, Sr., Wayne Frair, John Klotz, Walter Lammerts, Clifford Burdick, Karl Linsenmann, Harold Armstrong, Thomas Barnes, Duane Gish, John Grebe, Emmet Williams, and John Moore; absent, Harold Slusher.

Minutes of the 1970 Annual Meeting were read by William Tinkle and adopted without change. The treasurer's report by Richard Korthals showed that \$2100 more was received this year than in former years, although our finances always have been in the black.

The membership secretary, Wilbert Rusch, Sr., reported a gain of 300 members making a total of 1760. Of voting members there was a gain of 23. Voting members have advanced degrees in science; however, several sustaining members are well educated, having the Ph.D. degree, but in fields other than science. We have members in many counties even as far away as New Zealand.

Two visitors from Zondervan Publishing House of Grand Rapids were present. Robert DeVries reported that our textbook, *Biology: a Search for Order in Complexity* is one of the most outstanding books of their forty-year operation. Zondervan had ordered 10,000 copies in the first printing, and plans are made to publish 25,000 in June of this year. The price is \$7.95. A School Board member of Columbus, Ohio, has placed a copy of *Biology: a Search for Order in Complexity* in the library of each senior high school, and has given a copy to each biology teacher.

The U. S. Constitution guarantees the right to teach evolution and the *same right* to teach the alternative given in the Bible; both are religions. This statement was made and nobody disagreed.

Walter Lammerts, editor of *Why Not Creation?*, reported that the Craig Company published 4000 copies. The book consists of outstanding articles from Volumes 1 through 5 of the *Quarterly*, and since there were so many, Volume two will be published in August, 1971.

George Howe, Editor of the *Quarterly*, reported a broad base of 60 writers in different fields of science. Review and educational articles

are needed, as well as those reporting research. The emphasis of the 1972 Annual Issue of the *Quarterly* will be order or balance in nature as an evidence favoring creation science. Pictures on the front page of the *Quarterly* were authorized.

Several men reported on research projects completed, in progress, or in prospect. Clifford Burdick's discovery of pine pollen within rocks deep in the Grand Canyon of the Colorado River has been repeated by others, and pictures of this pollen were shown. George Mulfinger finds that the rate of formation of stalactites in the laboratory is faster than the estimates of natural formation. Coral reefs may have been formed where they stand or research may show that they have been washed into position. Larry Butler is chairman of the Research Committee.

At 9:15 A.M., April 17, the meeting again started with silent prayer. Henry Morris explained the work of the Creation Science Research Center at San Diego, California, where he now lives. Persons at this Center are writing textbooks. A Handbook for teachers will be published in June, 1971. A vote of thanks was given to the authors, co-editors, and Zondervan Publishing House, publisher of *Biology: a Search for Order in Complexity*. Our secretary was directed to write letters of thanks to Rita Ward and Elizabeth Barnes for their work on this book, and this has now been done. John Moore will report at next meeting on further textbook work. The research publication role of the Society was reaffirmed.

John Klotz presented changes in the constitution and a few were adopted but no one suggested changing the statement of belief. Concerning the Board of Directors, any voting member may make a nomination along with nominations by the Board itself, provided it is sent to the secretary not less than 60 days before the election and bears the endorsement of 25 voting members. The date of the next election of Board members will be February 24, 1972. All the members of the present Board were nominated for re-election, and the present officers were elected for another year.

The Board of Directors plans to meet at the Frontier Buffet, 2333 E. Stadium Blvd., Ann Arbor, Mich., 5 P.M., April 21, 1972.

WILLIAM J. TINKLE,
Secretary

LETTERS TO THE EDITOR

I would like to take issue with one statement made in the December, 1970 issue, on page 162: "the woman sinned before man." If one gives the slightest thought to the account in Genesis one sees that this is manifestly false:

(1) Sin entered the world through Adam, not Eve, and it is absurd to argue here that "Adam" or "one man" is being used generically to include Eve.

(2) The commandment disobeyed was given to Adam who in turn relayed it to Eve. The devil did not confront Adam but confronted Eve and induced Eve to doubt, not God, but Adam "Hath God said," or was it only Adam?

Eve doubted Adam, Adam doubted God. Adam was the first sinner, not Eve. Their eyes were not opened until after both had eaten, even though the account specifically says Eve ate before Adam. This, however, has no bearing on the Peter Principle.

The subtlety of the devil may be seen in that by confronting Adam with a living, breathing woman who had eaten the forbidden fruit, God's threat of immediate death to the eater must have seemed to Adam quite a bluff.

Sincerely,
JOHN W. ROBBINS
329 East University Parkway
Baltimore, Md. 21215

A Reply to John Robbins

The authors reassert that the statement "the woman sinned before the man" is true. In I Tim. 2:14 it is stated that Eve sinned. In Gen. 3:6 it is recorded that Eve sinned before Adam. If Eve had not sinned there would have been no judg-

ment of her as recorded in Gen. 3:16. This completes the proof that the woman sinned before the man. There is just no substitute for sound theology!

The sin of disobedience is called Adam's sin, not because Eve was innocent, but because Adam was made the head of Eve at Creation (cf. Rom. 5: 14). The sin is called Adam's transgression because Adam was the federal head of the family and the race, and was responsible for the action, even though done by his wife, I Cor. 15:22.

Eve's sin was a composite one. She doubted God in response to the serpent's inquiry, and questioned God's love. Eve finally ate fruit from the tree of the knowledge of good and evil. This whole process was sin. It is significant that the serpent did not say "Did Adam say" (as the critic suggests), but "Hath God said."

If God had fellowship only with Adam, Adam and Eve would not have walked in the garden in the cool of the day to fellowship with Him—Gen. 3:8. If Eve did not sin in eating the fruit she might have been living alone in the garden of Eden to this very day. If God had the fellowship with Adam and none with Eve, why isn't Heaven for men only? This is in contrast to Christ's earthly ministry when He had frequent fellowship with women.

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CREATION RESEARCH SOCIETY

Membership Voting membership is limited to scientists having at least an earned graduate degree in a natural or applied science. Dues are \$7.00 (Foreign, \$8.00 U. S.) per year and may be sent to Wilbert H. Rusch, Sr., Membership Secretary, 2717 Cranbrook Road, Ann Arbor, Michigan 48104. 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 \$7.00 (Foreign, \$8.00 U. S.) per year and includes subscription to the Annual Issue and Quarterlies. All others interested in receiving copies of these publications may do so at the rate of the subscription price for all issues for one year: (\$10.00 (Foreign, \$11.00 U.S.).

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

We propose to re-evaluate science from this viewpoint, and since 1964 have published a quarterly of research articles in this field. In 1970 the Society published a textbook, *Biology:*

A Search for Order in Complexity, through Zondervan Publishing House, Grand Rapids, Michigan 49506. All members of the Society subscribe to the following statement of belief.

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

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

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

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

