

Creation Research Society Quarterly

Haec credimus:

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

VOLUME 15

SEPTEMBER, 1978

NUMBER 2



CREATION RESEARCH SOCIETY QUARTERLY

Copyright 1978 © by Creation Research Society

VOLUME 15

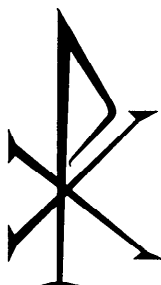
SEPTEMBER, 1978

NUMBER 2

EDITORIAL BOARD

Harold L. Armstrong, Editor
4 Couper Street
Kingston, Ontario, Canada

Walter E. Lammerts, Research Editor



Thomas G. Barnes	University of Texas at El Paso, Texas
Duane T. Gish	Institute for Creation Research, San Diego, Calif.
George F. Howe	Los Angeles Baptist College, Newhall, Calif.
John W. Klotz	Concordia Seminary, St. Louis, MO.
John N. Moore	Michigan State University East Lansing, Michigan
Henry M. Morris	Institute for Creation Research, San Diego, Calif.
William J. Tinkle	Anderson College (retired) North Manchester, Indiana
John C. Whitcomb	Grace Theological Seminary, Winona Lake, Ind.
Emmett Williams	Bob Jones University, Greenville, S. Car

Notices of change of address, and failure to receive this publication should be sent to Wilbert H. Rusch, Sr. 2717 Cranbrook Road, Ann Arbor, Michigan 48104.

Creation Research Society Quarterly is published by the Creation Research Society, 2717 Cranbrook Road, Ann Arbor, Michigan 48104. © by Creation Research Society.

Creation Research Society Quarterly is indexed in the *Christian Periodical Index*.

TABLE OF CONTENTS

	Page
Darwinism and Indoctrination G. H. Harper	83
The Cow that Jumped Over the Moon Donald L. Cyr	87
Solution and Deposition of Calcium Carbonate in a Laboratory Situation III Emmett L. Williams and Richard J. Herdtklotz	88
Was Ramapithecus the First Hominid? Chris C. Hummer	92
The Cephalopods in the Creation and the Universal Deluge John Woodmorappe	94
A Solution to Seeing Stars David M. Harris	112
Variation and Fixity Among Living Things. A New Biological Principle Frank L. Marsh	115
Thermodynamics, Energy, Matter, and Form H. L. Armstrong	119
Report of the 1978 Meeting of the Board of Directors	121
Panorama of Science	123
Book Reviews (1)	124
Letters to the Editor (2)	125

THE PERIOD AFTER THE FLOOD

The special Theme for the Annual issue of the *Quarterly* in June 1979 will be developments in the period after the Flood. Those few centuries or so were crucial to the Earth as we now know it. For a new regime had to be established, the old having been destroyed.

Possible topics might include: the spreading of humans, animals, and plants; the existence of land bridges which might have facilitated that spreading; and the re-establishment of the arts and sciences. There may be hints about these matters in the Scriptures; and some archaeological finds, properly interpreted, may throw light onto them.

Items for the next Annual should reach the editor by 1 February, 1979.

COVER ILLUSTRATION

The picture on the front cover is of the zodiacal light, taken by P. Hutchison at Mount Haleakala, Hawaii, January 1, 1967. It has been printed in *Space Science Reviews*, published by D. Reidel Publishing Co., Dordrecht, Holland, and is used here by permission.

There is more about the zodiacal light, and references for further reading, in the section Panorama of Science in this issue of the *Quarterly*. It may be noticed here, however, that this light can be evidence for a young Solar System. For were the System not young, the interplanetary dust, which causes the phenomenon by reflecting sunlight, would long since have been cleaned out.

DARWINISM AND INDOCTRINATION†

G. H. HARPER*

Introduction

Mention of indoctrination is normally met with thoughts of brainwashing and abhorrent political doctrines. We shall not be concerned with quite this sort of thing, though one element of the picture is accurate: throughout the article, we shall only be using "indoctrination" in its pejorative sense. If a teacher claims that he or she uses indoctrination to teach multiplication tables, and everyone applauds, then for the purposes of this article we shall not call that indoctrination. For the main purpose in identifying a case of indoctrination will be to criticize it.

For some time it has seemed to me that our current methods of teaching Darwinism are suspiciously similar to indoctrination. To try to establish whether there is indoctrination, I have used two approaches. The first involves a brief survey of the methods we use; the second is a more philosophical approach—namely to apply a criterion or means of identifying indoctrination to our teaching of Darwinism.

Three Theories

"Darwinism" as normally understood refers to a loose aggregate of theories. I hope it will be sufficient to separate these into only three groups.

1. Evolution theory can be considered quite independently of any mechanism for evolution if it is regarded as asserting only that species change into other species by gradual modification. Evidence is sought in the fossil record, the hierarchical structure of classifications, embryology, homology, and distribution.
2. "Natural selection research" will refer to those recent studies in which variation, heredity, and natural selection are measured, together with small-scale effects like changes in morph frequencies in polymorphisms, supposedly due to the natural selection. These effects are not considered to be examples of evolution, in the sense of 1. This is probably a legitimate field of scientific investigation, as witnessed by the efforts expended on *Cepaea*, *Biston* (and *Arion* slugs by myself).
3. "Darwin's theory" will refer only to the idea that natural selection causes evolution—i.e., it proposes

a connection between the phenomena studied in 2 and the evolution postulated in 1.

At places in the article it will not be necessary to differentiate between 1 and 3, and together they will be referred to as Darwinism.

Indoctrination Methods

A review of methods used to put across Darwinism to children gives cause for concern. The following will be considered: (i) we expose children at an early age to the theory we want them to learn; (ii) we do not present alternative theories, or if we do then inadequately; (iii) if alternatives are presented, this happens at a later age; (iv) we state that the theory or parts of it are proved; (v) we make statements and ask questions which implicitly assume the theory to be true; (vi) we suggest that the theory is validated by a method which is inapplicable; (vii) we cast aspersions on those who do not conform. All this adds up to a catalogue of the methods we would expect to be used in the case of well attested political or religious indoctrination. As a battery of methods, they are formidable. It forms, in my view, reasonable grounds for suspecting that we are indoctrinating. The seven techniques will be discussed in a little more detail.

Children may be exposed at an early age to the idea of evolution. For instance, at the age of about six, they can read in bold type 2½ mm high that "After millions of years, some fish grew legs and had lungs. They had become amphibians." And then, "Slowly some amphibians changed into reptiles".⁵

At this stage, alternatives to Darwinism are not usually mentioned, and even if they appear later during secondary education they are often presented so poorly and unconvincingly that many children cannot understand them, let alone imagine how they might originally have been firmly believed. Children learning biology through the Nuffield O-Level Biology course, for instance, spend a lot of time on natural selection and evolution. At least 20 pages of Text V (1st edition) are devoted to them, while all they read about alternative theories is the following: "... even now some refuse to accept the theory of evolution; others see in it a denial of the existence of God. We cannot pursue this issue further here but, on the basis of what you have learnt on this course you should think seriously about the subject." Most pupils reading this are coming to the end of their biology education, and if they have been trained to think *in vacuo*, they might have a very slight chance of arriving at some appreciation of alternatives to Darwinian evolution. If on the other hand they have to think on the basis of what they have learnt on the course, the chance is near zero.

The fourth method in the list is the assertion that evolution is proved or that the evidence is conclusive. This example, in a Ladybird Book aimed at children around ten years old, refers to Darwin: "What he said, and proved by thousands of examples, was that over millions of years animals and plants have changed. This he called evolution. It is a word which means that all

*Mr. G. H. Harper teaches at St. Albans School, St. Albans, England. His address is 7 Epsom Court, Berry Lane, Rickmansworth, Herts, England.

†This article appeared originally in *The School Science Review*, vol. 59, no. 207, pp. 258-268, December 1977, and is reprinted here by permission. The text is the same as in the original; there are a few small changes in layout. The original had two illustrations, which it was not convenient to reproduce here. The one was from Reference 5, a book intended for children. It showed pictures of an amphibian and a reptile, and had an unqualified statement that they evolved from something else. The other is a picture of a Negro, from Reference 10, and was accompanied by the statement quoted toward the end of the article.

The School Science Review is published by The Association for Science Education, College Lane, Hatfield, Herts, England. It has to do with the teaching of science, mostly at a level corresponding to High School and the beginning of University.

the birds and animals and plants which we know today, have developed from earlier forms. They were not created as different species millions and millions of years ago when the world began".⁷ A similar method makes use of a statement or question which does not assert that the theory is true, but simply assumes it—e.g., "What were the ancestors of the insects?" or "What form of natural selection caused the evolution of birds from reptiles?" This is even less likely to stimulate a child to query the question begged than the dogmatic assertion that the theory of evolution is proved.

At the secondary level some science courses¹ stress the method of scientific research (problem, hypothesis, testing) and then introduce Darwinism as a product of scientific research. Pupils can do little else but assume that Darwin's theory is assessed by the same method. I shall argue in the next section that the main part of Darwin's theory—theory 3—has not been, and cannot be, assessed by this hypothetico-deductive method, and that it is logically impossible for there to be any evidence against it. So, naturally enough, any pupils searching for evidence against are unable to find any. Who can blame them for concluding that the theory is scientifically well supported, and therefore probably true?

Finally, there is the method of casting aspersions. Sir Gavin de Beer was keen on battering those who do not conform, as when he wrote that the theory of evolution "is now universally accepted except by those who are too ignorant or too idle to acquaint themselves with the facts".³ We do the same sort of thing to children; for instance, the passage already quoted from *Nuffield Biology Text V* contains the phrase "even now some refuse to accept . . ." The example may look innocuous, but in indoctrination that may mean it is all the more effective because it is absorbed subconsciously.

I have discussed *Nuffield Biology Text V* with its author, and accept that the *intention* was to present the material in a non-indoctrinatory way, as one would expect in the Nuffield scheme. Nevertheless, examples of two methods in the above list found their way into print. I believe this indicates how deeply an indoctrinatory approach is engraved into our teaching of Darwinism. Succeeding in being non-indoctrinatory is difficult.

Evidence for Darwin's Theory

Establishing the use of method (vi) above depends on showing that theory 3 is not in fact susceptible to scientific investigation. This will then be used as the basis of a second approach to demonstrating indoctrination—the use of a criterion of indoctrination.

It is generally accepted that the normal kind of scientific theory refers to an infinite number of possible instances, and no amount of evidence can prove it, whereas a statement of a set of observations can contradict it, and hence be said to falsify it. So it is clear what evidence against the theory consists of. Evidence for the theory, on the other hand, would be a set of observations which could be predicted from the theory.

In pursuing this approach, it will be necessary to render Darwin's Theory into the form of a conditional statement. The following may be suggested:

- I "If (A) there is inherited variation, and
(B) there is mortality among individuals before they would otherwise finish reproducing, and
(C) there is, in this mortality, a selective advantage to one variant,
then (T) there will be evolution in the direction indicated by the natural selection."

Despite certain simplification, it is hoped the terms will be understood. I maintain that all four groups of observation are, in fact, observable; one can measure inheritance, mortality, natural selection, and—in principle at least—evolution.

To illustrate this, let us suppose that we observe variation in the color of the adult plumage in a population of pigeons, and that this variation is inherited. We also observe mortality among the pigeons through predation by falcons, and that there is a larger number of pale pigeons in those taken by the falcons than expected if the falcons selected prey at random. So we have an observation of natural selection. On the basis of Darwin's theory (version I) we predict that the frequency of the pale morph, or the general paleness of the whole population, will decrease.

On the face of it, there appears to be good reason to suppose that evidence relevant to the theory could be produced. For instance, evidence for the theory might consist of the observations (A), (B) and (C), together with the observation that the frequency of the pale morph or the general paleness of the population does decrease. Evidence against might be the same except that the plumage change does not occur, or occurs in the opposite direction.

The Darwinist might not, however, be prepared to accept such evidence as a falsification of the theory—indeed he would be crazy to do so. He could easily think up possible circumstances which would show that the supposed evidence against the theory was in fact compatible with it. For instance, there might be another kind of variation in the pigeons which is correlated with plumage; perhaps pale adults tend to have nestlings with more down on them than those of dark adults. Darwin quotes several examples of correlated characters in the *Origin of Species*.⁴ Pale adults may in fact leave more offspring to the next generation than dark adults (accounting for evolution actually occurring in the direction opposite to that originally expected) if the advantage of having downier chicks in cold weather more than offsets the disadvantage of having pale plumage as an adult.

It is clear that version I given above is not an adequate rendering of Darwin's theory, since it suggests the theory is falsifiable in a way which Darwinists would not accept. In fact, one cannot make a serious prediction about evolution without taking into account possible characters correlated with the one under principal consideration. On this basis, a prediction can only be made if one inserts into version I a condition stating that there is no correlated character with a greater but contrary selective advantage. So we arrive at a more satisfactory rendering of the theory as follows:

- II "If (A) there is inherited variation in a population, and

- (B) there is mortality among individuals before they would otherwise finish reproducing, and
 - (C) there is, in this mortality, a selective advantage to one variant, and
 - (D) there is no correlated character with a greater contrary selective advantage,
- then (T) there will be evolution in the direction indicated by the natural selection."

This version is presumably more acceptable to Darwinists, and would allow them to make serious predictions if (A), (B), (C) and (D) were known for a population. Unfortunately, however, (D) cannot be known—it cannot be observed. Any organism possesses an infinite number of characters, and it is in principle impossible to check them all for correlation or for selective advantage. The importance of this is that, to produce evidence against the theory, all of (A), (B), (C), (D) and "not (T)" must be observed; to produce evidence for the theory, all of (A), (B), (C), (D) and (T) must be observed; and neither is possible even in principle. So we *cannot* have observational evidence for or against Darwin's theory, and needless to say none has ever been produced. One might have suspected the latter on other grounds, anyway, since the kind of evolution Darwin was writing about is too slow to be detected in practice. He put it like this: "We see nothing of these slow changes in progress, until the hand of time has marked the long lapses of ages . . ."⁴

It might be objected that there is evidence for Darwin's theory—for instance demonstrations of natural selection, inheritance, and large mortality before reproduction, as in natural selection research. I have to agree that if these phenomena are not demonstrated, Darwinism would be less convincing, and to this extent these demonstrations support the theory. However they can hardly be considered to be very good evidence for the following reason.

The supposed evidence consists in demonstrations that conditions (A), (B) and (C) actually apply. It is rather like saying you have evidence for the theory "If Moses lived, then the earth was made in six days" simply in the demonstration that Moses lived. Consider now a perfectly plausible theory that someone might propose—"If (A), (B), (C) and (D), then there is no evolution". (This theory is not inconsistent, and is true for all people who deny evolution.) We now have the situation that evidence for (A), (B) or (C) can equally "support" Darwin's theory and another non-evolutionary theory. It does not discriminate between them, and I suggest therefore that this "support" is not serious evidence for Darwin's theory.

Criteria for Indoctrination

Leaving aside the methods we use in teaching Darwinism, we can try a different approach to the demonstration of indoctrination. If we had an accepted criterion—a description which fits all cases of indoctrination and which may or may not express its "essential" features—we could compare it with our teaching. If the teaching fits the criterion, then it is indoctrination.

One possible criterion depends on the nature of the beliefs or ideas being taught. One might propose, for in-

stance, that any teaching of "doctrine" or "ideology" must be indoctrination. However it is surely possible to teach the doctrines central to Marxism or Christianity, for instance, in such a way that the teacher could not be criticized for it. If alternative views or theories are presented as well as the doctrine in question, if there is open discussion, and if it is left to the pupil to decide which view he prefers, few people would criticize this approach, and it could hardly be called indoctrination pejoratively.

We can also reject a criterion based on the mental state of the person after being taught. Although we may regard the successfully indoctrinated person as holding firmly to the belief in question, and arguing dogmatically against any criticism of it, it is quite conceivable that the same state of mind might exist in a person who has obviously not been indoctrinated. Such a person might have casually picked up a smattering of the ideas of Christian doctrine, as well as ideas about alternative doctrines, and then become convinced of the truth of Christian doctrine through having some kind of dramatic experience which he interprets as Revelation and which is beyond the control of anyone else.

More than one writer has accepted a criterion which depends instead on the intentions of the teacher. White¹¹ holds that a teacher is an indoctrinator if it is his intention that the pupil should believe what is taught in such a way that nothing will shake that belief. Snook⁹ suggests something similar: "a person indoctrinates P (a proposition or set of propositions) if he teaches with the intention that the pupil or pupils believe P regardless of the evidence". Despite the vagueness of "regardless of the evidence" Snook's criterion strikes me as the most acceptable and practicable, and I shall use it in the rest of this article.

The meaning of "intention" is made clear by Snook as follows: a person indoctrinates if "(i) in his teaching he is actively desiring that the pupils believe what he is teaching regardless of the evidence, or (ii) he foresees that as a result of his teaching such an outcome is likely or inevitable". Either sense of "intention" is acceptable in the criterion.

Clarification is also needed for the phrase "regardless of the evidence". In this respect, the educator is characterized as the teacher who is primarily concerned with the evidence and methods of assessing it and drawing conclusions, and only secondarily with the conclusions or beliefs based on the evidence. The pupils, in other words, are fitted to handle evidence for themselves, and to draw their own conclusions. On the other hand, the indoctrinator is mainly concerned to hand on a particular set of beliefs, and the evidence is only used as a means to that end. This may involve improper use of evidence but it also allows acceptable use of it.

To illustrate this, Snook refers to Marxists' improper use of evidence. "In Marxist social theory, the proletariat (wage-earners) is seen as an oppressed class, growing poorer until it inevitably spear-heads revolution." However, "When it is established that the workers are getting richer not poorer, the Marxist answers that *relatively* they are getting poorer. When it is suggested that in some countries workers are not oppressed, the reply is that they are oppressed in more sub-

tle ways. Remark that the peasants, not the proletariat, have spear-headed revolution, and the 'proletariat' is redefined as 'the workers and peasants'." After further discussion Snook concludes: "The result is that evidence can never go against the claim; *any* evidence is compatible with the claim". Whether or not this example is a caricature, it is an important illustration which will be referred to again.

Applying Snook's Criterion

Snook's criterion is now applied to the teaching of Darwin's theory in the following way. In terms of the criterion it would be far-fetched to claim that teachers of Darwin's theory do not have the intention that pupils should believe in Darwin's theory. Perhaps only some actively desire that the pupils should believe, though this presumably includes all teachers of Darwin's theory who believe it themselves and want their pupils to believe in truths and not falsehoods: and among those teachers who do not fall into this category, many would fulfil the "intention" criterion simply because they realize that, as a result of their teaching, their pupils' belief in Darwinism is likely.

We get into a bit of difficulty when we try to apply "regardless of evidence". What does it mean when there is no evidence? Possibly it is undefined in this situation, in which case it is not very helpful, or it could mean "not taking account of evidence"—i.e. behaving as if there wasn't any, or ignoring difficulties posed by evidence, in which case it applies. I believe, however, that Snook intended it to apply to this kind of situation. There is a close similarity for instance, between the Darwinist and the Marxist in the example quoted earlier. Both can take any relevant information whatever, true or false, and reconcile it with their theory. The Darwinist can always make a plausible reconstruction of what took place during the supposed evolution of a species. Any difficulties in reconciling a given kind of natural selection with a particular phase in evolution can be removed by the judicious choice of a correlated character. Secondly, Snook characterized the "educator" as the teacher who is primarily concerned with evidence and the handling of it, while the indoctrinator is primarily concerned to put across a set of conclusions. Looked at in this way the teacher of Darwin's theory corresponds with the latter, since he undoubtedly is concerned to put across the conclusion that natural selection causes evolution, while he cannot be concerned to any great extent with real evidence because there isn't any.

If it is accepted that (i) proposition II is a fair rendering of Darwin's theory, (ii) Snook's criterion is acceptable, and (iii) it is applicable, then indoctrination is demonstrated.

What is Wrong with our Method

We ought to be concerned about the use of indoctrination and indoctrination methods: with regard to the methods, although their use may be acceptable for some teaching situations, with Darwinism there is *no need* to use them. The theories could easily be taught without any of the seven methods, and the theories need

not be taught at all. Secondly, simply because there is no real evidence for Darwin's theory, there is a correspondingly less excuse for using this approach to teaching. As Schleiden⁸ remarked in the last century: "Never is Man more, and indeed almost only then, intolerant, when a scientific proof or confutation is out of the question".

Christians of a fundamentalist bent could reasonably object that such teaching results in the perpetration of a falsehood, and this is not a point of view to be so lightly brushed aside, or completely ignored, as it usually is. We might sometimes question whether uniformitarianism embodies a true theory, or only a rule of the scientific game.

In the field of politics, people subscribing to left-wing views could well object that indoctrinating children with the idea that progress in nature depends on competition, together with the oft-quoted aim in education of showing that "Man is just as much a part of nature as any other species" (Ladybird Books Ltd. advertisement brochure) is in fact indoctrination in right-wing political notions.

Perhaps the most intangible but far-reaching influence of evolution theory is to keep alive the notion of the *scala naturae*. This was an important idea before 1860, and involved the ordering of plant and animal species along a scale from the lowest to the highest. It was given a new lease of life by Darwinism, since the scale could now be seen as the sequence of stages through which the higher, complex and advanced species might have evolved from the lower, simple and primitive species. There is unfortunately a close association between the ideas of "low/high", "simple/complex", "primitive/advanced" and "bad/good". We would not nowadays state in a school textbook that "the Caucasian race is the highest in intellect and energy, and occupies the most highly civilized part of the world . . . It is found in every part of the world, and is always the dominant or ruling race"; nor would we describe the "oriental negro" as "the lowest of all savages, living in trees, and more like an animal than a man . . .".¹⁰ But Western man still sees himself as having the highest form of civilization, while society in an underdeveloped country is usually seen as less advanced. If the *scala naturae* idea had been allowed to die quietly, and had not been "kept going" by the theory of evolution, we might now be able to judge the "progress" of other races and nations in terms which are morally neutral, and other than simply how closely they approximate to our own standards.

Postscript: Alternative Theories

Theories alternative to Darwinism and evolution form such a large topic that it would need a separate article to deal with it adequately. In outline, however, the following questions may be asked, and some answers are suggested.

- (a) Was there a "beginning", a time before which no organisms existed? Answers: yes, or no.
- (b) If there was a "beginning", how did the first species arise? Answers: by spontaneous generation, special creation, or arrival from elsewhere.

- (c) Did new species arise other than at the beginning? Answers: no, or yes. If yes—by spontaneous generation, special creation, non-evolutionary methods such as “saltation”, or arrival from elsewhere.
- (d) Whether or not new species arise, does new variation arise? Answers: yes, or no.
- (e) If new inherited variation arises, how does it? Answers: at random, or non-randomly. If non-randomly, then adaptively or non-adaptively.
- (f) What happens to new variation if it arises? Answers: it survives, or there is natural or artificial selection.
- (g) If there is natural selection of variation, what happens? Answers: nothing, minor modification of the population (such as alteration of morph frequency), or evolution.

It may be objected by some that there is no need to mention alternatives to Darwinism because none of the alternatives is widely believed. This argument might be acceptable if we were also prepared to accept the same argument from a Soviet indoctrinator—that he doesn't teach capitalism because so few people in the USSR believe in it.

Acknowledgements

The original draft of this article was written during a period of vacation residence at St. John's College, Ox-

ford, and I am most grateful to the College for providing facilities.

Ladybird Books Ltd. have kindly given permission for the reproduction of quotations and illustrations from *Dinosaurs* and *Charles Darwin*, and the illustration from *The Victoria Geography* is reproduced with acknowledgement to Frederick Warne & Co. Ltd.

Notes and References

- ¹Nuffield Biology Text I (Penguin, 1966). The method of scientific investigation is described on p. 32.
- ²Nuffield Biology Text V (Penguin, 1967), p. 202.
- ³de Beer, G., *Reflections of a Darwinian* (Nelson, 1962), p. 9.
- ⁴Darwin, C., *The Origin of Species* (John Murray, 1859). Correlated characters are discussed on p. 183 of the 1970 Penguin edition, and the speed of evolution is mentioned on p. 133.
- ⁵Douglas, C., *Dinosaurs* (in series 737 of Ladybird Books, Loughborough, 1974). References to evolution are found on pp. 11 and 14.
- ⁶Harper, G. H., 'Polymorphism in a Bardsey slug'. Bardsey Observatory Report. 1966.
- ⁷Peach, L. du G., *Charles Darwin* (in series 708 of Ladybird Books, 1973). The quotation is on p. 4.
- ⁸Schleiden, M. J. *The Plant, a Biography* (Hippolyte Bailliere 1848, English translation by A. Henfrey).
- ⁹Snook, I. A., *Indoctrination and Education* (Routledge & Kegan Paul, 1972). His criterion is given on p. 47; "intention" is discussed on p. 50; the Marxism example is on p. 56.
- ¹⁰Valentine, Mrs., *The Victoria Geography* (Frederick Warne & Co., c. 1872). The quotations are from pp. 24 and 27.
- ¹¹White, J. P., 'Indoctrination' in *The concept of education*, ed. R. S. Peters (Routledge & Kegan Paul, 1967). Quoted in Snook (1972).

THE COW THAT JUMPED OVER THE MOON†

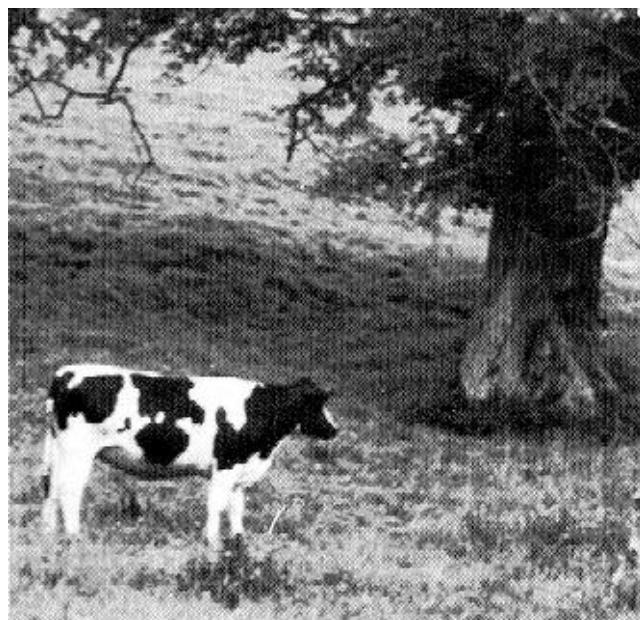
DONALD L. CYR*

To convince anyone that this is the cow that jumped over the moon would be impossible . . . but to show that there is evidence that *this* cow descended from a bovine astronaut is almost within the realm of possibility. Of course, we would have to see things from the cow's viewpoint.

In the story of Jack and the Beanstalk, you will recall that Jack traded his mother's cow for some magic beans that enabled him to ascend to a high level where Giants lived. Maybe this cow is a direct descendant of Jack's cow, but there is no evidence supporting such a conjecture.

Let us then consider the "evidence" that does exist. The cow pictured (in the illustration) is not an ordinary one, for, among other things, it grazes on the "nose" of

the "Dog of Langport", a great effigy believed by some to be stretched out in Somerset, England. The map also calls this mound "King Alfred's Ford" and the road



*Mr. Donald L. Cyr receives mail at P.O. Box 30887, Santa Barbara, California 93105.

†This item was published originally in the *Stonehenge Viewpoint*, volume 9 number 1, page 1 of the catalog section, Spring 1978. It is copyrighted (1978) by Donald L. Cyr, and is reprinted here by permission.

The *Stonehenge Viewpoint* is published at P.O. Box 30887, Santa Barbara, California 93105. It has to do with ancient men, and especially with the megalithic cultures. Certainly there is much to be learned along these lines; it is now becoming abundantly clear that until very recently the abilities and achievements of ancient men elsewhere than in the Near East and the Mediterranean regions were grossly underrated.

signs refer to it as "Burrow Mump". Whether it is a natural hill or an artificial one is not really known. But our cow "knows" more than she is willing to tell.

When her ancestor took the fabled trip over the moon, we may be certain that she looked back at the earth from her vantage point in space. In fact, we know this because the location of the continents was obviously impressed on her consciousness.

So impressed was the original "cow that jumped over the moon" that she left a record for all her descendants to appreciate. We can view the record even now impressed on the side of the cow that lives on Burrow Mump. You will note that this present day descendant has the MAP OF THE WORLD impressed in her side!

Note that North and South America are shown prominently for all to view. We can see Asia on the left, and Europe and Africa on the right. Everything seems to fit just the way that the cow-astronaut viewed the scene away back then . . .

The critic will note that there is a peninsula of land jutting out from Africa toward the Azores. No such peninsula of land exists . . . well at least not any more. But dare we believe that when the cow has made her famous jump, this is what Atlantis looked like?

Such a cow hide as this would have been worth its weight in gold to the early explorers. Just think how Columbus would have valued it. Perhaps, St. Brendan had just such a hide on his boat when he travelled to the New World. Perfect security! Who would have believed that it was really a map of the world.

Capt. Cook could have used it too to visit the Hawaiian Islands, although more likely what is shown in the Pacific is the residue of the lost island of Mu. Or as the cow reports it, "Mooooo"!

(Editor's note.) I presume that this item was intended as a joke. Yet, really, is the proposal not about as believable as some of the evolutionary notions about how things which happened to ancestors have affected the descendants?

SOLUTION AND DEPOSITION OF CALCIUM CARBONATE IN A LABORATORY SITUATION III

EMMETT L. WILLIAMS* AND RICHARD J. HERDKLOTZ**

Received February 20, 1978

Previous work on the conditions necessary for the rapid growth of speleothem-like structures in the laboratory has been reported.^{1,2} These results were discussed in relation to possible natural conditions. A tentative model for the formation of limestone caves and possible dripstone formation was proposed.² Certain phases of the continued experimental work are reported in this paper.

Amount of Water Available as a Factor in Limestone Cave Formation and Deposition of CaCO_3

It was suggested that the amount of water available during and after the Flood would be favorable to the rapid formation of caves in recently consolidated limestone.³ This view has been strengthened by comments found in various technical articles. Ford⁴ considers the volume of available groundwater as a factor in the development of limestone caves in the central Mendip region of England. Franke⁵ states that the volume of stalagmite formation is governed by the supply of water. Gardner⁶ claims that the rate at which dripstone forms is affected by the amount of seepage water.

In an excellent article on the formation of limestone caves, Thraikill⁷ states

It will be noted that many of the processes thought to be of importance in cave excavation will operate most effectively *during floods*. (emphasis ours)

*Emmett L. Williams, Ph.D., is Chairman of the Department of Physics, Bob Jones University, Greenville, South Carolina.

**Richard J. Herdklotz, Ph.D., is Chairman of the Department of Chemistry, Bob Jones University, Greenville, South Carolina.

†Pertaining to underground waters, especially those at or below the water table.

Acidity of Water in the Development of Limestone Caves

It was shown in earlier experiments how rapidly acidic solutions can dissolve limestone.⁸ It is possible that the remaining Flood waters particularly where the water level was not very far above the ground (shallow-phreatic conditions)[†] would have been highly acidic due to the decomposition of organic material. This could have contributed to rapid cave formation in limestone. The action of acids on cave formation has been noted previously.^{9,10} This may be why the shallow phreatic zone cave development theory is an important concept.^{11,12} Thraikill¹³ feels that the dissolving power of water in the shallow phreatic zone is greater than that of water in the deep phreatic zone because it contains more CO_2 .

Carbon Dioxide Content of Water

The previous section leads to a discussion of the amount of CO_2 in water which can dissolve and later precipitate CaCO_3 . It was introduced in a previous report¹⁴ and is included here simply to reinforce the hypothesis. Decaying organic material in Flood waters could provide a good supply of CO_2 . Concentrations of CO_2 up to 100 times normal have been measured in humus.¹⁵ The solution of this gas in water is considered

to be quite rapid.¹⁶ The decay of organic material not only provides a supply of organic acids, but also CO_2 . Both can dissolve limestone, but it appears that water with organic acids is not effective as CO_2 -laden water alone in the precipitation of CaCO_3 in a cave.¹⁷

Cave Humidity and Precipitation of CaCO_3

It has been suggested that stalactite growth is possible only in ventilated caves.¹⁸ This means that speleothem growth is greatly retarded in areas of caves where the humidity is near 100%. Gardner¹⁹ claimed in 1935 that in Mammoth Cave the development of dripstone was confined to the higher and drier portions of the cavern whereas only excavation was in process in the lower and damper levels. Subwater deposition is not common in any caves except so-called "crystal caves".²⁰

An experiment was run to check this concept. Distilled water charged with CO_2 was allowed to run over Beekmantown dolomite. The water then dripped down strings which were completely enclosed in an airtight plastic container. Water was allowed to stand in the bottom of the plastic container. The disassembled experimental rig is shown in Figure 1. The empty solution box (plastic cube) can be seen on the top. Strings suspended from this box hang down in the plastic buckets that are taped together. Slits covered with transparent plastic material allow for observation of the strings during the experiment run. No moisture



Figure 1. Apparatus used to ensure a wet environment around the precipitation area.

escapes from the apparatus as 100% humidity conditions are maintained. A heat lamp was directed through the large piece of plexiglass sheet at the bottom of the rig to encourage the precipitation of calcium carbonate.²¹

The test was run for 500 hours and 75 liters of water dripped down the strings. The strings were examined at the end of the test and found to be covered with a loose powdery, clay-like material. A total of 1.463 grams of deposit was found on 12 strings. There was no evidence of CaCO_3 precipitation. Thus it is felt that the precipitation of speleothems in very wet areas in unventilated caves is highly unlikely.

Presence of Ammonia and Precipitations of CaCO_3

Weeks²² cited evidence to show that the decomposition of nitrogen-bearing substances, such as proteins, release ammonia or amines, increasing the pH of water which would favor the deposition of CaCO_3 . It was decided to run an experiment to test this hypothesis. The same experimental rig shown in Figure 1 was used except that the heat lamp was removed.

Ammonia was admitted into the base of the apparatus. NH_3 was generated by dropping sodium hydroxide solution on ammonium fluoride powder. The rate of addition of the hydroxide was controlled to allow the slow release of ammonia into the string area of the experimental apparatus. A schematic diagram of the complete apparatus is shown in Figure 2.

Considerable experimental difficulty was experienced in this test. The strings were not securely attached to the solution box so that considerable water passed over the strings unnecessarily. Too much passage of water (similar to a continual fine stream) compared to the

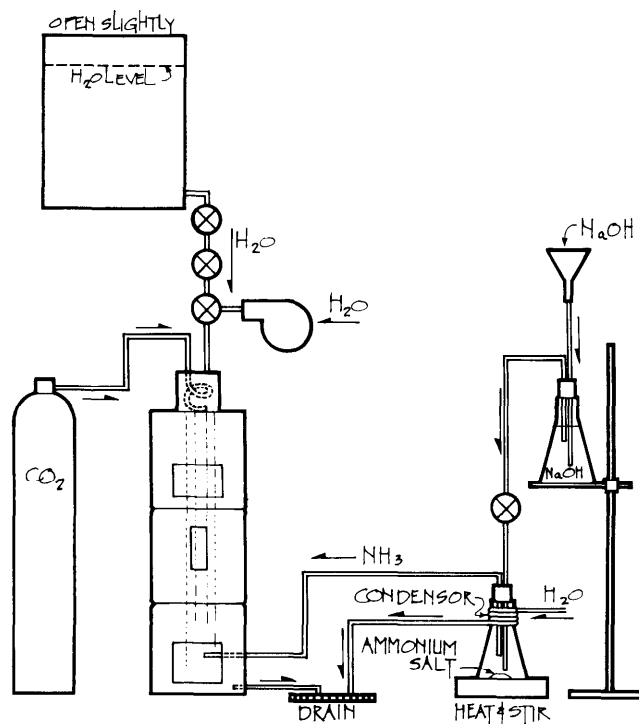


Figure 2. Schematic view of the apparatus used to provide the wet environment, and also the atmosphere of ammonia.

maintenance of a thin film of water on the depositing structure may have had an adverse effect on the growth of CaCO_3 .²³

1260 liters of water passed over the strings in 501.5 hours. Even under the excessively humid conditions some calcium carbonate did precipitate particularly on the upper part of some strings. The experimental results are tabulated in Table I. Thus it appears that even under very humid conditions, with ammonia present in the atmosphere, the precipitation and subsequent slow growth of dripstone may be possible.

Crystalline Form of Deposited CaCO_3

The crystal structure of the precipitated calcium carbonate from a previous experiment²⁴ was determined. The precipitation occurred from water at 45 °C to solid material at 50 °C. An x-ray diffraction analysis revealed that the deposit had the crystalline form of aragonite. It is known that the aragonite form of calcite does precipitate in warm water highly saturated with CaCO_3 .²⁵ However it has been found that when calcite is ground dry in a mechanical mortar at room temperature it changes to aragonite.²⁶ Also Wallis claims that mixtures of calcite and aragonite can be deposited at temperatures between 30 and 90 °C.²⁷ Based on these uncertainties further x-ray diffraction analysis will be done.

Precipitation by Chemical Action

The deposit mentioned in the previous section could have been formed either by evaporation of the water or through chemical action by the loss of CO_2 . If evaporation occurred, the deposit should contain both calcium and magnesium carbonate since the limestone in the solution box was dolomitic in nature. An EDTA titration analysis of the deposit revealed that all of the carbonate present (99.27%) was CaCO_3 . Also a qualitative magnesium determination using p-nitrobenzene-azoresorcinol yielded negative results. Therefore it is concluded that the deposit formed by means of chemical precipitation and not by evaporation.

Discussion of Results

In the work mentined in this report and in previous experiments^{28,29} it has been shown that under certain conditions in the laboratory rapid precipitation of CaCO_3 can be attained. If these conditions existed in the natural state, it is conceivable that speleothems could have developed rapidly in limestone caves.

It has been noted previously by scientists who are not creationists that present rates of stalactite and stalagmite growth in limestone cannot be used to assume ages for these structures. Franke³⁰ states

If an attempt is to be made to date stalagmites it is important that the results obtained should be reliable, and it is always necessary to estimate the magnitude of any simplifications made in formulating the theory. As has been shown in this paper an approximation to the rate of growth can be attempted in the case of simple candle-shaped stalagmites where near constant conditions of growth can be assumed. Indiscriminate application

Table I. Deposition of CaCO_3 from a solution of water and carbon dioxide at 25 °C. Test time 501.5 hours, 1260 liters of water passing through the apparatus.

String	Mass of Deposited CaCO_3 (grams)	Rate of Deposition (grams of CaCO_3 per year per liter of water)
1	0.0292	
2	0.3730	
3	0.2427	
4	0.3391	
5	0.0344	
Total deposition	1.0184	0.0141

of the growth theory, however, is likely to yield false results. In each individual case it is essential to assess whether growth did in fact occur under ideal conditions. Theories of stalagmite formation in their present form cannot therefore be adapted to routine measurements of age or growth rates.

Gardner³¹ writes

In some cases, stalactites and stalagmites in the top most levels of a cavern may approximate the age of the cavern itself, having been produced in a stage of its youth; others are younger. Their beginnings may spread over nearly all periods of the cavern's history. In many instances they are still growing, and new ones are being formed as the years advance. Hence they are not dependable in determining the age of a cavern. The rate at which dripstone forms is a variable factor, due to changing circumstances; it depends on the amount of seepage water, the quantity of carbonate in solution and the rate of its precipitation. It is a common practice to attempt to fix the age of dripstone by the rate at which it forms, but this is plainly a valueless calculation. It invariably results in fixing the age of a stalactite or stalagmite in proportion to its size; the largest will be the oldest and the smallest the youngest. For example, in Carlsbad Cavern at the present time, the management maintains a large sign on an immense stalagmite, stating that it is estimated to have an age of 60 million years. Guides give the information that the calculation is based on the rate of so many cubic inches per year at which such dripstone formed. The writer believes that such signs should be removed by the National Park Service as being misleading to the public.

Thus neither creationists nor uniformitarianists should use laboratory or field information on dripstone to claim an age for them. However as creationists we can point to various conditions under which these structures can grow rapidly.

The growth of dripstone on portland cement structures must be handled with care.³² In an excellent creationist study³³ Helmick, Rohde, and Ross pointed out that the aging process in limestone will affects its solubility in water. This in turn will affect the deposition of CaCO_3 structures. What are the solution properties of "young" limestone? A creationist study on the formation of this material is desperately needed.

It should be noted that "aged" limestone has been used in this study. Under proper conditions the growth of laboratory dripstone from this material is quite rapid. Many instances can be noted for the quick growth of dripstone on portland cement objects^{34,35} which may have similar chemical properties as "young" limestone. Therefore it appears that predictions of fast-growing dripstone based on creationist model is a valid theory.

Future Work

Work will continue on conditions favorable to the rapid growth of laboratory dripstone. It is desirable to test the effect of changing pressure, but difficulties dealing with the experimental apparatus have been experienced. Hopefully these can be overcome, and some experimental information can be obtained. It is hoped that other variables can be tested as well.

Acknowledgments

The authors gratefully acknowledge the receipt of grants from the Creation Research Society for the last four years. These grants helped to finance part of the work.

Also, the authors appreciate the x-ray diffraction analysis work done by Mr. John Wolseiffer of the Chemistry Department at Bob Jones University. The following students at Bob Jones University made major contributions to this phase of the study: Michael Balon, Reinhold Friske, and Steven Berglind.

References

- ¹Williams, E. L. et. al. 1976. Deposition of calcium carbonate in a laboratory situation I, *Creation Research Society Quarterly* 12(4):211-212.
- ²Williams, Emmett L. and Richard J. Herdktlotz. 1977. Solution and deposition of calcium carbonate in a laboratory situation II, *Creation Research Society Quarterly* 13(4):192-199.
- ³*Ibid.*, p. 197-198.
- ⁴Ford, Derek C. 1965. The origin of limestone caverns: a model from the Central Mendip Hills, England. *The National Speleological Society Bulletin* 27(4):109.
- ⁵Franke, H. W. 1965. The theory behind stalagmite shapes. *Studies in Speleology* 1(Parts 2-3):92-93.
- ⁶Gardner, James H. 1935. Origin and development of limestone caverns, *Bulletin of the Geological Society of America* 46:1270.
- ⁷Thraikill, John. 1968. Chemical and hydrologic factors in the excavation of limestone caves. *Geological Society of America Bulletin* 79:43.
- ⁸Williams and Herdktlotz. *op. cit.*, pp. 193-194.
- ⁹Howard, Alan D. 1964. Processes of limestone cave development. *International Journal of Speleology* 1(1-2):47-60.
- ¹⁰White, William B. 1960. Terminations of passages in Appalachian caves as evidence for a shallow phreatic origin. *The National Speleological Society Bulletin* 22(Part 1):discussion p. 53.
- ¹¹Thraikill. *op. cit.*, pp. 19-46.
- ¹²White. *op. cit.*, pp. 43-52.
- ¹³Thraikill, John V. 1960. Origin and development of Fulford Cave, Colorado. *The National Speleological Society Bulletin* 22(Part 1):61.
- ¹⁴Williams and Herdktlotz. *op. cit.*, pp. 192-193.
- ¹⁵Franke. *op. cit.*, p. 92.
- ¹⁶Thraikill, John. 1972. Carbonate chemistry of aquifer and stream water in Kentucky. *Journal of Hydrology* 16:100.
- ¹⁷Williams and Herdktlotz. *op. cit.*, pp. 193-194.
- ¹⁸Went, F. W. 1975. Private Communication to E. L. Williams.
- ¹⁹Gardner. *op. cit.*, p. 1269.
- ²⁰Thraikill, John. 1968. *op. cit.*, p. 34.
- ²¹Williams and Herdktlotz. *op. cit.*, pp. 195-196.
- ²²Weeks, L. G. 1957. Origin of carbonate concretions in shales, Magdalena Valley, Columbia, *Bulletin of the Geological Society of America* 68:95-102.
- ²³Thraikill, John. 1976. Spelothems, Chapter 3.2 in *Stromatolites, Developments in Sedimentology Series no. 20* (M. R. Walter, editor), Elsevier Scientific Publishing Co., Amsterdam, p. 82.
- ²⁴Williams and Herdktlotz. *op. cit.*
- ²⁵Sweeting, Margorie M. 1973. *Karst Landforms*, Columbia University Press, New York, p. 10.
- ²⁶Bathurst, Robin G. C. 1975. Carbonate sediments and their diagenesis, *Developments in Sedimentary Series no. 12*, second edition, Elsevier Scientific Publishing Company, Amsterdam, p. 234.
- ²⁷Wallis, T. E. 1956. Calcium carbonate in the scale from water. *Journal of the Royal Microscopical Society* 76:4.
- ²⁸Williams and Herdktlotz. *op. cit.*, p. 192-199.
- ²⁹Williams, E. L. et. al., *op. cit.*
- ³⁰Franke. *op. cit.*, p. 95.
- ³¹Gardner. *op. cit.*, p. 95.
- ³²Moore, G. W. 1962. The growth of stalactites, *The National Speleological Society Bulletin* 21(Part 2):99.
- ³³Helmick, Larry S., Joseph Rohde, and Amy Ross. 1977. Rapid growth of dripstone observed. *Creation Research Society Quarterly* 14(1):13-17. See especially page 14.
- ³⁴Helmick, Rhode, and Ross. *Ibid.*, pp. 13-17.
- ³⁵Fisher, Lloyd W. 1934. Growth of stalactites. *American Mineralogist* 19:429-431. (Fisher has collected many observations and compiled them in this brief paper.)

NOTICES OF BOOKS

Foundations of Electricity and Magnetism, by Thomas C. Barnes, Third Edition, 1977. Published by the author at 2115 N. Kansas, El Paso, Texas 79902. xi + 413 pages. While we have not often reviewed textbooks on Physics, this one is mentioned because of its special features. They are: Dr. Barnes' work on the Earth's decreasing magnetic field; and the work by him

and Pemper on electrodynamics, elementary particles, and an alternative to the theory of relativity. These things have been discussed in articles in the *Quarterly*.

For the rest, the book gives an adequate treatment of electricity and magnetism, and would be quite suitable as a text.

WAS RAMAPITHECUS THE FIRST HOMINID?

CHRIS C. HUMMER*

Received April 18, 1978

Ramapithecus is frequently put forth by evolutionists as the first hominid or first member of the family of man. The evidence for this position is extremely fragmentary and the scenario is fraught with problems. This paper argues that the evidence does not warrant the taxonomic status of "hominid" for *Ramapithecus*. Man appears in the fossil record suddenly and without ancestral form.

The fossil ape *Ramapithecus* is the only candidate for being the first member of the family of man. Yale's David Pilbeam said of him, "I think *Ramapithecus* species of Africa and India are hominids."¹ There are at least six problems, however, for the hominid status of *Ramapithecus*.

(1) There is a huge gap in the fossil record between the latest ramapithecine and the earliest australopithecine. Current evidence places the australopithecines between 1 and 5 million years ago.[†] The most recent date for ramapithecine finds is 8 million years.² Richard Leakey recently wrote,

Ramapithecus (was) tentatively exploring the forest fringes some nine to twelve million years ago. There then opens up an enormous fossil void until round about four million years ago . . . This yawning void is particularly frustrating because on one side of it there is just one creature, *Ramapithecus*, while milling about on the other side is a menagerie of hominids . . .³

Elwyn J. Simons admits that this "large gap in time" is "the only evolutionary room available in the fossil record for such a postulated form" that would demonstrate the resemblance of *Ramapithecus* to "hominid stock ancestral both to primitive *Homo* and to *Australopithecus*."⁴ Filling in the 4 to 5 million year gap is a major project now under way by paleoanthropologists.

(2) The fossil record contains a possible biological surprise. If *Ramapithecus* begat *Australopithecus* it is surprising that such a cosmopolitan ape (see the list below) as *Ramapithecus* gave rise to *Australopithecus* only in Africa. So far *Australopithecus* fossils have been found exclusively in Africa.

(3) All of the major ramapithecine finds consist only of a collection of teeth and fragments of jaws that would scarcely fill a cigar box. Perhaps thirty individuals are represented. There are no postcranial bones. The major finds are listed here.

- | | |
|------|---|
| 1932 | G. E. Lewis, Siwalik Hills, northern India: upper jaw fragment (<i>Ramapithecus punjabicus</i>) |
| 1961 | L. S. B. Leakey, Fort Ternan, Kenya: parts of both sides of the upper jaw (<i>Kenya-pithecus wickeri</i>) |

- | | |
|---------|---|
| 1969 | Miklos Kretzoi, Rudabanya Mountains, Hungary: upper and lower jaw fragments |
| 1972 | Bruno von Freyburg, Greece, during World War II; formal description 1972: tooth bearing part of lower jaw (<i>Graecopithecus freyburgi</i>) |
| 1973 | Ibrahim Tekkaya, Çandir, Turkey: lower jaw fragment |
| 1975-77 | D. R. Pilbeam, Pakistan: jaw fragments (the most recent date of 8 million years is associated with these finds) |

The scarcity of finds is further complicated by the fact that isolated tooth finds are often insufficient in providing information about adaptation or taxonomy.

Data obtained from these specimens have often led to a variety of conflicting interpretations. Morphological analysis of occlusal surfaces, especially when isolated teeth are evaluated, may not provide definitive answers regarding either adaptation or phylogeny.⁵

Quite recent micrographic studies of tooth enamel prism patterns in *Homo sapiens*, living apes and *Ramapithecus punjabicus* seem to indicate a greater similarity between *Ramapithecus* and *Homo sapiens* than between *Ramapithecus* and living apes.⁶ *Science News* reports David Gantt, one of the researchers, as saying that the study represents "the first quantified evidence" that *Ramapithecus* is a human ancestor.⁷ In the research report, however, Gantt, together with David Pilbeam and Gregory Steward, was more conservative:

Interpretation of these structural differences is at present conjectural . . . before drawing any conclusions about phylogeny (that is, whether *Ramapithecus* is ancestral to later hominids), it will be necessary both to examine a full range of extinct Neogene hominoids and to analyze the functional significance of prism packing and enamel thickness.⁸

Five months before this study was published David Pilbeam is reported as saying that it is impossible to point to either *Sivapithecus*, *Ramapithecus* or *Gigantopithecus* as being the human ancestor.⁹

(4) The dental fragment of the type specimen from India permits at least two reconstructions, one of which is clearly not that of a hominid (Fig. 1). The dental arcade of man is parabolic or perhaps semicircular in outline. Modern apes have a U-shaped jaw with parallel rows of molars. Apes have large canines, while in man and *Australopithecus* the canines are reduced.

The usual published reconstruction of *Ramapithecus* shows a man-like dental arcade. In his original descrip-

*Mr. Chris C. Hummer teaches Anthropology at the Plymouth-Whitemarsh Senior High School, Plymouth Meeting, Pennsylvania; and Prehistoric Archaeology at the Schuylkill Valley Nature Center, Philadelphia. His address is 1211 Rose Lane, Berwyn, Pennsylvania 19312.

†In reporting the great ages assigned to these fossils, I am not necessarily subscribing to them.

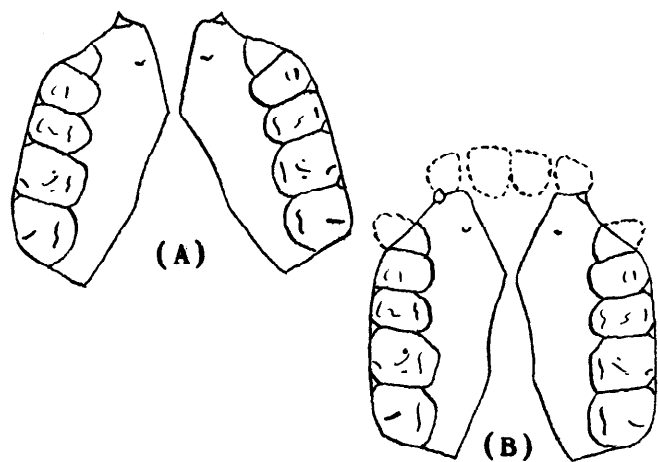


Figure 1. Reconstruction of the palatal arcade of *Ramapithecus*, showing (A) humanlike pattern, the usual published reconstruction; and (B) an apelike arrangement with parallel rows of molars and precanine diastemas.

tion in 1934 G. E. Lewis spoke of a parabolic shape for the jaw. More than one evolutionist has taken issue with Lewis', and, later, Simons' reconstruction. Christian Vogel is one:

In 1961, Simons, for the first time, published a reconstruction drawing of the dental arcade on the basis of the maxillary fragment YPM 13799, which showed a nearly parabolic form with the post-canine rows of teeth strongly diverging posteriorly. This reconstruction was accepted and reproduced unchanged by numerous authors as proof of the similarity of *Ramapithecus* to the hominids.

Finally, in 1969, Genet-Varcin, using the same outline drawing of YPM 13799 produced by Simons in his reconstruction, demonstrated that a completely different reconstruction indicating similarity with the typical U-shaped dental arcade of the pongids and other non-human primates was also possible.¹⁰

Vogel concludes that the dental fragments are not sufficient to warrant the inclusion of *Ramapithecus* in the Hominidae. Furthermore, it should not be overlooked that there are some features in the dentition of YPM 13799 which are far from being typically hominid . . .¹¹

Grover Krantz is another who questions the reconstruction and the scenario based upon it.

Ramapithecus fossils are limited to jaws and teeth. Compared with other Miocene "apes", they are short muzzled and their canine teeth do not project very far. Claims of a rounded, humanlike palate are based on a dubious reconstruction. Because no complete palate has been reported, one could just as easily orient the maxillary fragments with parallel molar rows. Such a reconstruction would also allow for larger, more apelike incisors.

A precanine diastema (canine gap) is evident in the photographs of two Indian specimens of *Ramapithecus* (Simons 1969:329), yet this is ignored in the published reconstructions.¹²

Simons has since admitted the existence of the diastema in the upper jaw of *Ramapithecus*, but says also that the

teeth of the lower jaw are closely packed with no apparent diastema. This is based, no doubt, on the Çandir mandible from Turkey.¹³ Krantz suggests in his article that *Ramapithecus* fossils are merely female specimens of certain dryopithecine apes.

It may also be pointed out that a living monkey, the gelada baboon of Ethiopia, has teeth quite similar to *Ramapithecus* and is believed to occupy a similar primate niche.¹⁴

(5) The fossil ape *Gigantopithecus* presents a paradox related to the *Ramapithecus* case. Anatomist Alan Walker says that "*Gigantopithecus* has been amply demonstrated to be a pongid (ape)", and hence has no place in the scheme of the hominid evolution.¹⁵ Yet this extinct gorilla-like Miocene ape reportedly had numerous dental characteristics that later reappeared in early hominids (australopithecines). How can the disappearance from and later reappearance in two different lines be explained?

Size seems to be the criterion by which the quite diminutive *Ramapithecus* is accorded the status denied to his much larger relative. In reality *Ramapithecus* is not necessarily any more an ancestor than was *Gigantopithecus*. Robert Eckhardt, geneticist and anthropologist, has expressed the view that *Ramapithecus*, too, was an ape:

Neither is there compelling evidence for the existence of any distinct hominid species during this interval (Miocene and early Pliocene times), unless the designation 'hominid' means simply any individual ape that happens to have small teeth and a correspondingly small face. Fossil hominoids such as *Ramapithecus* . . . seem to have been apes—morphologically, ecologically and behaviorally.¹⁶

(6) There is a problem in the scenario involving the timing of the generic splits or the separation of the apes and hominids from the ancestral stock. The usual accepted scenario based on fossils and radiometric dating suggests that the dryopithecines gave rise to apes and hominids, the former splitting off some 15 to 20 million years ago, the latter emerging about 12 million years ago. However, recent work by Allen Wilson and Vincent Sarich on comparisons of protein molecules in the blood of living primates suggests that the splits occurred much more recently: gorillas, chimpanzees and hominids all separated from ancestral stock only about 4 million years ago!¹⁷ The time difference in the appearance of the first hominid (presumably *Ramapithecus*) is therefore about 8 million years. Richard Leakey says "so gross a discrepancy in the apparent timing is more than a little disconcerting. The question still remains to be resolved."¹⁸

Comments

At the present time only *Homo* and *Australopithecus* are indisputably recognized by evolutionists as true hominids.¹⁹ The claim for *Ramapithecus* as the first hominid is practically untenable with such meager and controversial evidence. Leakey says that "the case for *Ramapithecus* as a hominid is not substantial, and the fragmentary material leaves many questions open . . . the arguments for the hominid status of this genus are

severely limited.”²⁰ And F. Clark Howell’s admission is to the point:

We still do not know the source of the hominids, but it is possible that their origin may lie between 7 and 15 million years ago, and perhaps not only in Africa. This time range is still not well known. Anyone who feels that we already have the problem solved is surely deluding himself.²¹

The importance to the evolutionist of the hominid status of *Ramapithecus* cannot be overestimated. If *Ramapithecus* is not the first hominid then the already remarkable “sudden appearance” of *Homo* in the fossil record becomes overwhelming. It means that for more than 20 million years of supposed primate evolution there are no known ancestral forms for man. Elwyn Simons admits: “*Ramapithecus* is ideally structured to be an ancestor of hominids. If he isn’t, we don’t have anything else that is.”²²

References

- ¹In Edey, Maitland A., 1972. *The missing link*. Time-Life Books, New York, p. 146.
- ²1977. “Pakistan fossils: New origins for man,” *Science News* 111(16):244. (April 16)
- ³Leakey, Richard E. and Roger Lewin, 1977. *Origins*. E. P. Dutton, New York, p. 81.
- ⁴Simons, E. L., 1977. *Ramapithecus*, *Scientific American* 236(5):28-35. (May)
- ⁵Gantt, David G., David Pilbeam, Gregory P. Steward, 1977. Hominoid enamel prism patterns, *Science* 198(4322):1155-1157.
- ⁶*Ibid.*, p. 1156.
- ⁷1977. “Tooth patterns and the human-ape split,” *Science News* 112(25):405. (December 17)
- ⁸Gantt, David G., *et al.*, *op. cit.*, p. 1157.
- ⁹Kolata, Gina Bari, 1977. “Human evolution: hominoids of the Miocene,” *Science* 197(4300):244-245 & 294.
- ¹⁰Vogel, Christian, 1975. Remarks on the reconstruction of the dental arcade of *Ramapithecus*. *Paleoanthropology, morphology and paleoecology*. Edited by Russell H. Tuttle. Mouton Publishers, The Hague, p. 88.
- ¹¹*Ibid.*, p. 96.
- ¹²Krantz, Grover, 1975. The double descent of man. *Paleoanthropology, morphology and paleoecology*. Edited by Russell H. Tuttle. Mouton Publishers, The Hague, p. 147.
- ¹³Simons, E. L., *op. cit.*
- ¹⁴Leakey, Richard E. and Roger Lewin, *op. cit.*, pp. 69, 71.
- ¹⁵Walker, Alan, 1976. Remains attributable to *Australopithecus* in the East Rudolf succession, Earliest man and environments in the Lake Rudolf basin. Edited by Yves Coppens, F. Clark Howell, Glynn Ll. Isaac and Richard E. F. Leakey. University of Chicago Press, Chicago, p. 484.
- ¹⁶Eckhardt, Robert B., 1972. “Population genetics and human origins,” *Scientific American* 226(1):94-103. (January) See especially p. 101.
- ¹⁷Leakey, Richard E. and Roger Lewin, *op. cit.*, p. 56.
- ¹⁸*Ibid.*
- ¹⁹It should be made clear that *Australopithecus* cannot be called a hominid by creationists. “Hominid” in the evolutionary biological taxonomy is the family name for man. The name implies both morphological similarities and common evolutionary, and, therefore, biological origin. Both *Homo* and *Australopithecus* appear suddenly in the fossil record. Common biological origin has not been demonstrated. If we must use the term, then we believe that only members of genus *Homo* are “hominid”. Australopithecines are extinct apes who happened to have a few morphological features in common with man.
- ²⁰Leakey, Richard E., 1976. “Hominids in Africa,” *American Scientist* 64(2):174-178.
- ²¹In Edey, Maitland A., *op. cit.*
- ²²1977. “Puzzling Out Man’s Ascent,” *Time*, Nov. 7:67.

THE CEPHALOPODS IN THE CREATION AND THE UNIVERSAL DELUGE

JOHN WOODMORAPPE*

Received October 24, 1977

“Then God said, ‘Let the waters teem with swarms of living creatures’ (For He commanded and they were created: Psalm 148:5b . . . calls into being that which does not exist: Romans 4:17d) . . . with which

the waters swarmed after their kind: and God saw that it was good . . . And there was evening and there was morning, a fifth day.”

—Genesis 1:20-23 (NASB)

The study of claims of Cephalopod evolution reveals many fossil-gaps; but the outstanding result is the discrediting of the Biogenic Law and the discovery of the large degree of similarity in forms considered to be unrelated by evolution.

Much of the stratigraphic order (generic; specific) ascribed to ammonoids is actually due to time-stratigraphic concepts and to taxonomic manipulations. Indeed, “condensed” sequences demonstrate rather mixing with cataclysmic burial.

The known ecological positions of cephalopods independently fit together into a mutually contemporaneous ecologically zones coexistence. The actual stratigraphic order (ordinal; familial) owes its existence to the burial of these ecological zones in the Flood, while physical sorting during burial gave rise to interfamilial stratigraphic order.

Outline

Introduction

- I. Creation Versus Evolution of the Cephalopods
 - A. Origin of Phylum Mollusca and its class Cephalopoda
 - B. The Genesis of Orders and Lower Taxons
 - C. Fallacies of Recapitulation as Illustrated by Cephalopods
 - D. “Convergence” in Cephalopods as Evidence for Creation

II. Explaining Ammonoid Biochronological Horizons: a Challenge for Diluviology

- A. The Substantial Subjectivity of Fossil “Species” and “Genera”
- B. Procedures Which Eliminate Successional Discrepancies
- C. The Scattered—Not Worldwide—Distribution of Fossil Zones
- D. Biochronologic Ammonoid Zones as Taxonomic Concoctions
- E. “Condensed” Ammonitiferous Deposits Indicate Rapid Burial

*John Woodmorappe, B.A., has studied both Geology and Biology.

- III. The Stratigraphically-Ordered Flood Burial of Cephalopods
 A. Ecological Zonation and the Deluge: Preliminary Considerations
 B. The Antediluvian Ecologically-Zones Coexistence of Cephalopods
 C. The Sequential Flood-Burial of Cephalopods

Introduction

The Cephalopods, a Class of the Phylum Mollusca, are a group of predacious marine creatures which have had a long, illustrious fossil-record history but of which only few forms are extant. The Cephalopods deserve Creationists' scholarly attention because (1) They are the most complex, most advanced, and naturally the most studied of all the invertebrates; (2) Most evolutionary tenets lend themselves to clearer, more revealing examination through Cephalopods than through vertebrates; (3) Some Cephalopods (Ammonoids) play a major role in the intercontinental biostratigraphic "time"-correlation and geologic-"age" claims because of their unrivaled degree of stratigraphically-ordered succession; this group providing the stiffest challenge to Diluvology because of its successional order. Accordingly, this work evaluates claims of their evolution and impeccable successional order, and then provides a carefully-supported ecological explanation for their successional order in the (Flood deposited) Phanerozoic fossil record.

The extant *Nautilus* (Fig. 1) provides a useful reference for a brief synopsis of Cephalopod morphology. The internal organs reveal a high degree of tissue/organ/physiology specialization and efficiency uncommon among invertebrates. The extended tentacles catch food; the radula tears flesh; digestion follows. Reproduction is sexual, from eggs. Some cephalopods have no larval stage (unlike other molluscs). Swimming takes place by means of rocket propulsion when the Mantle Cavity is allowed to fill with water (simultaneously aerating the Gills) and this highly-muscular organ forcibly expels the water out the Funnel (Hyponome), propelling the animal. The conch partly encloses the body.

The conch is the most important part (from the present viewpoint) because only it survives as a fossil. The shell is not molted as in other molluscs, but progressively larger sections are grown (camarae, sealed off by septa). Unlike Gastropods, most cephalopods thus seal off most of their shells by septa during ontogeny. The shell serves as a versatile hydrostatic organ for swimming because (recently discovered) gas amounts in the sealed off camarae are actively regulated by the siphuncle (the only living part of the organism in the conch once that part of it is sealed off).

The Class Cephalopoda is composed of (somewhat controverted) 25 Orders (Fig. 2), 360 Families, 3000 Genera, and 10,000 species. Of these, merely 650 species of 4 Orders survive: the Octopodida (Octopus), Teuthida (Squids), Sepiida (Cuttlefish), and Nautilida (*Nautilus*).

The *Nautilus* (Fig. 1) may serve as a model of this class. The following variations in conch morphology are important: Among subclass Coleoidea (the most radically differing from *Nautilus*), the extinct Belem-

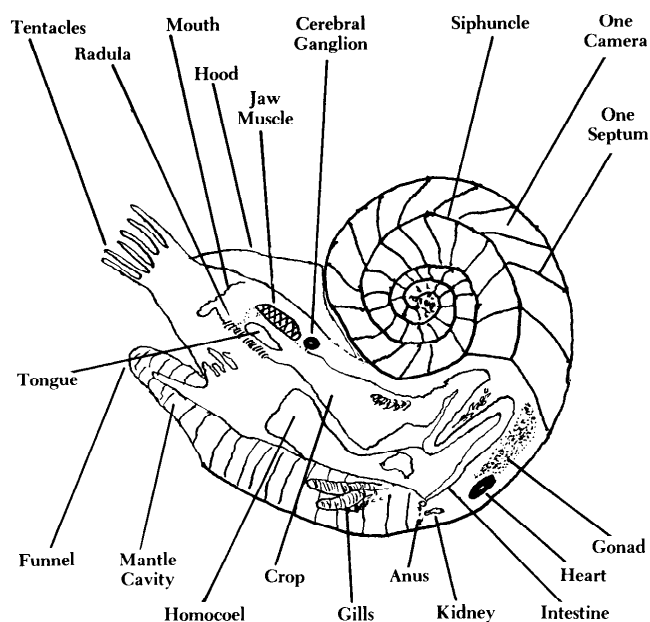


Figure 1. The *Nautilus*: the sole living representative of the conchiferous Cephalopods. Explained and discussed in the text. Modified after Sweet, Reference 1.

nitida had completely straightened-out (bullet-shaped) conch with a heavy calcareous rostrum ("shield") in front and the conch length devoted to the body, long in relation to cameral sections (unlike *Nautilus*). The Order Sepiida went further: the entire ventral (bottom) half of the conch was occupied by the body. Still further goes the extant Squid (Order Teuthida) which has an internal, thin, bullet-shaped shell with only vestigial septa (not supportive of evolution: may be a genetic-code remnant of the more common conchiferous design employed by God elsewhere). It is the largest, fastest, and most advanced of all the invertebrates. The Order Octopodida is a sluggish swimmer with no shell.

Other than the just-discussed Coleoidea, all other Cephalopod subclasses and their orders are quite similar to the *Nautilus* (Fig. 1): differences being primarily of size, shell shape (coiled, uncoiled, tightly or loosely coiled) intraconchoidal deposits, suture shape, etc.

Specifically, the very important (biostratigraphically) subclass Ammonoidea (Orders Anarcestida, Prolecanitida, Clymeniida, Goniatitida, Ceratitida, Phyllocerida, Lytocerida, and Ammonitida) differs in having thinner shells, shell ornamentation (external ribs, keels, spines, nodes, etc.) and—most importantly—corrugated septa. The Endoceratoidea (Endocerida, Intejocerida) are noted for conical sheaths around the siphuncle (for ballast) and uncoiled, crescent-shaped conches. The Actinoceratoidea (Actinocerida) has cameral deposits (for ballast), as do many of Orthocerida, Belemnitida, Discosorida (which is of Subclass Nautiloidea). Most early Paleozoic forms are orthoconic (straightened-out shells) but all other lineages become coiled much like the *Nautilus*, except the aforementioned Coleoids and Bactritida (which remain straight) and a few aberrantly-coiled and torticonic Ammonoids. Most other differences from *Nautilus* are ones of proportion.

I. Creation Versus Evolution of the Cephalopods

A. Origin of Phylum Mollusca and Its Class Cephalopoda

The Cambrian explosion, which immediately eliminates 80% of any supposed (in this case) molecules-to-molluscs evolution, is very striking. In fact, for Fischer³ the puzzle is "... the simultaneous appearance of exoskeletons in so many different kinds of plants and animals." "To date, the Precambrian has yielded no molluscs..."⁴ and there is only an imagined "... hypothetical ancestral mollusc..."⁴

Dozens of theories have been proposed to explain this explosion; and if Kuhn,⁵ a philosopher of science, is correct in stating that the arising of many versions of a theory is a sign of its growing failure to face facts, evolution thus begins to collapse. Just one of many of these subsidiary hypotheses proposes that the Phyla Mollusca, Annelida, and Arthropoda arose from a non-preserved seriated, pseudo-metamorphous flatworm⁶ which underwent rapid, major (regulatory gene) mutations.⁷ Needless to say, such grand-transforming mutations (like gradual mutations/natural selection) have never been demonstrated (much less proved) and "... form a fundamental question in evolutionary biology."⁷ The oft-repeated claim that molluscs have arthropod/annelid affinities is based on embryological similarities and the supposedly metamerous mollusc *Neopalina*. Many now maintain⁸ that this is only a superficial resemblance of true metamerism and therefore not convincing.

Not only is the evidence for an evolutionary origin of mollusca (like other phyla) unconvincing, but so is that of the resulting classes. "The *unrecorded* Precambrian creatures were antecedent to about ten classes of mollusks."⁹ Besides, "... survey of the first obscurely crawling molluscs could have afforded *no faintest indication* of possibilities eventually realized in the (among others)... predacious, rapidly darting squids."¹⁰ (emph. added, and so on unless specified.) "The origin of the cephalopods, like that of other mollusks, is shrouded in the darkness of the Precambrian."¹¹ "... the roots of the cephalopod tree lie somewhere deep in the Precambrian."¹² "As with nearly every other group of organisms, *there is no objective record* of the earliest stages of cephalopod history."¹³ Many decades ago, the *Volborthella* was proposed¹⁴ as the first cephalopod, but recently it has been pointed out that this fossil is very enigmatic and may be a Tunicate,¹⁵ etc. Recently, the monoplacophoran *Kirenyella*,¹⁶ which is septated (unusual for non-cephalopods) and similar to the cephalopod *Plectronoceras* has been cited as the monoplacophoran-to-cephalopod transition. However, just as there are no (incipient-structure) transitions in vertebrate evolution¹⁷ (no part-fin/part-leg (fish-to-amphibian), no half-scale/ half-feathers (reptile-to-bird), etc., transitions),¹⁷ so likewise the supposedly-transitional *Kirenyella* shows no sign of a siphuncle, or even a partly-evolved one.¹⁶ The origin of siphuncle, like most else, is relegated to speculation.

Although the Cambrian explosion goes contrary to all expectations of evolution, paleontological speculations to explain it away are prevalent, because—as the Soviet

paleontologist Sokolov¹⁸ remarks: "I know geologists who regard the whole of Darwin's theory and the present day synthetic theory of evolution (which do in fact have weak spots) as a type of religion; but we may readily imagine the chaos that would face us in geology were the evolution concept to become a myth..."

B. The Genesis of Orders and Lower Taxons

A diagram very similar to Fig. 2 shows dotted lines (gaps) between the Ellesmerocerida rootstock and most subclasses and Nautiloid orders.¹⁹ The long debate as to whether the ammonoids evolved from coiled Nautiloids (Tarphycerida) or the Bactritida continues;²⁵ reinforced by a conch-coiling gap in the latter alternative²⁰ as well as the former.²¹ Donovan²² contends for a Belemnitid ancestry for all the Coleoids in contradistinction to Teichert² (Fig. 2); Jeletzky²³ simply leaves dotted lines with question marks in portraying how the six Coleoid orders relate to the supposedly-ancestral Bactritids and to each other. Among "advanced" ammonoids: "A phylogenetic classification here breaks down. There are so many ammonites... which cannot reliably be traced back to their parent stock that it is still a practical necessity to retain a polyphyletic suborder Ammonitina for all those ammonites (the vast majority)."²⁴

The evolutionist Boucot²⁶ excellently summarizes the role of transition-lacks: "Since 1859 one of the most vexing properties of the fossil record has been its obvious imperfection. For the evolutionist this imperfection is most frustrating as it *precludes any real possibility for mapping out the path of organic evolution* owing to an infinity of 'missing links'... once above the family level it becomes very difficult in most instances to find any solid paleontological evidence for morphological intergrades between one suprafamilial taxon and another. This lack has been taken advantage of classically by opponents of organic evolution as a major defect in the theory... the inability of the fossil record to produce the 'missing links' has been taken as solid evidence for disbelieving the theory." It is not "taking advantage" to see that, even if time is gratuitously granted to the fossil record, it does not empirically demonstrate bio-transformism: all life—including cephalopods—was directly created by God and some of it buried (why in such stratigraphic order to be discussed in detail) during the Noachian Deluge.

Evolutionists seek to explain the gaps either by claiming that preservation-failures²⁷ (as from sedimentation breaks, etc.) or "punctuated equilibria"²⁸ (bursts of evolution too rapid to be fossil-recorded) explain the absent transitions. But the fact remains that admittedly transitions are absent;³¹ and no arguments from ignorance or secondary hypotheses (akin to "Epicycles" proposed to "patch-up" the failing Ptolemaic geocentric theory) can remove it. In fact, if anything, evolutionary steps are so deduced to make the smallest gaps: Harper²⁹ stating, other factors about equal, ancestor-descendant lineages should be constructed that leave "fewer or shorter stratigraphic gaps." All fossil taxonomy is so designed to abet evolutionary speculations: "... any paleontological classification should be... phylogenetical at all levels... the concepts of tie and derivation must, indeed, be brought to define all its categories..."³⁰

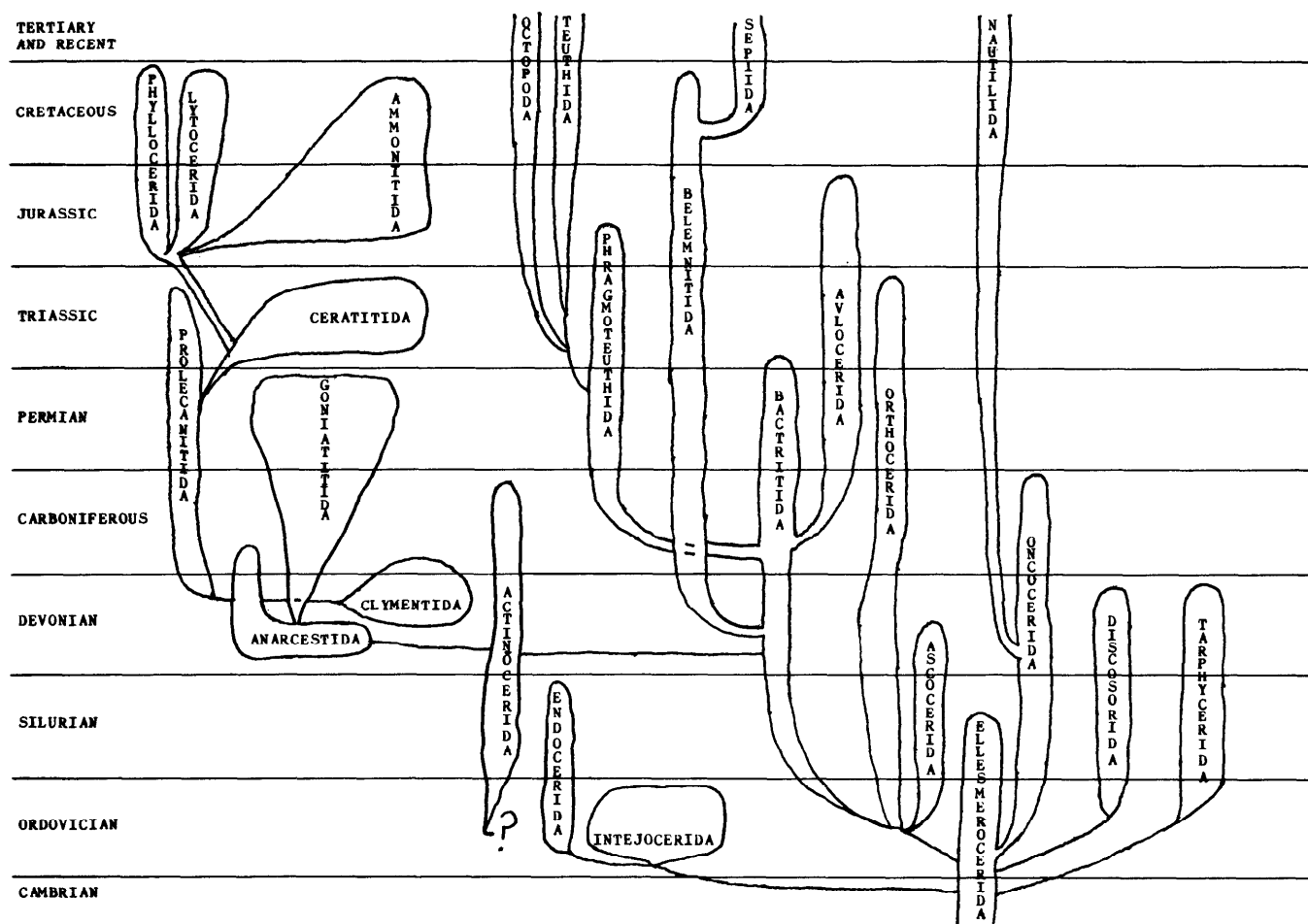


Figure 2. The stratigraphic positions and claimed evolutionary affinities of the 25 orders of Cephalopods. Modified after Teichert, Reference 2.

Not fact, but imaginative speculation thereby dominates evolution: evolutionary steps can only be "... inferred"³² and, "Of course, *we can never prove that the sequence we see actually mirrors the evolutionary process.*"³³ The sequence is considered probable if it repeats in different places and "facies," but Flood burial will later be considered an equal or superior explanation. Cephalopods, especially ammonites, specifically yield speculative evolutionary lineages: "The chief obstacle to such studies is that a lineage is an oversimplified concept; it is impossible to pick out a stratified succession of individuals which can with certainty be said to be genetically connected in the strict ancestor-descendant relationship . . . it is difficult to be sure that our choice of individuals is not guided by preconceptions of what we are looking for."³⁴ Creationists must remember this recent statement by Gould, *et. al.*:³⁵ "Paleontologists (and evolutionary biologists in general) are famous for their facility in devising plausible stories; but they often forget that plausible stories need not be true."

Gaps abound at even lower taxon-levels: "... a great number of species of Jurassic ammonites appear and disappear suddenly and have neither known ancestry nor descendants."³⁶ These are not exceptions: "... explosive evolution of radically new types . . . is so common in the history of the Cephalopoda."³⁷ Many out-of-nowhere fossils exist.

Many claims, however, are made that a large number of gradual (transition-filled) sequences are now known. Closer examination reveals that abrupt changes of structure actually happen in these "continuous" supposed evolutionary lineages. Reyment,³⁸ for example, while noting the rarity of transition-filled sequences, claimed that he had some good examples of them: yet he noted that one trend was the disappearance of shell ornament, and this "loss of ventrolateral tubercles" was not gradual; suddenly it was completely gone in the otherwise identical superjacent "descendant." Many apparent lineages, as indeed the stratigraphic distribution of all cephalopods, are simply the result of the ecologically-controlled Floodwater burial of the cephalopod fossils (a whole area which will be discussed and documented in detail): most others seem continuous because they are so defined taxonomically. Thus cephalopod "species" and "genera" are incredibly subjective designations (will be fully documented) readily manipulable to so designate "species" and "genera" that they arbitrarily single out some morphological-attribute trend as an evolving lineage: ignoring others. Fig. 3(i) using general symbols for fossils, illustrates this; whereby a gradual arm-addition trend is taxonomically singled out (enclosed) by completely disregarding arm patterns which do not fit this "gradually evolving" trend, making this semi-random

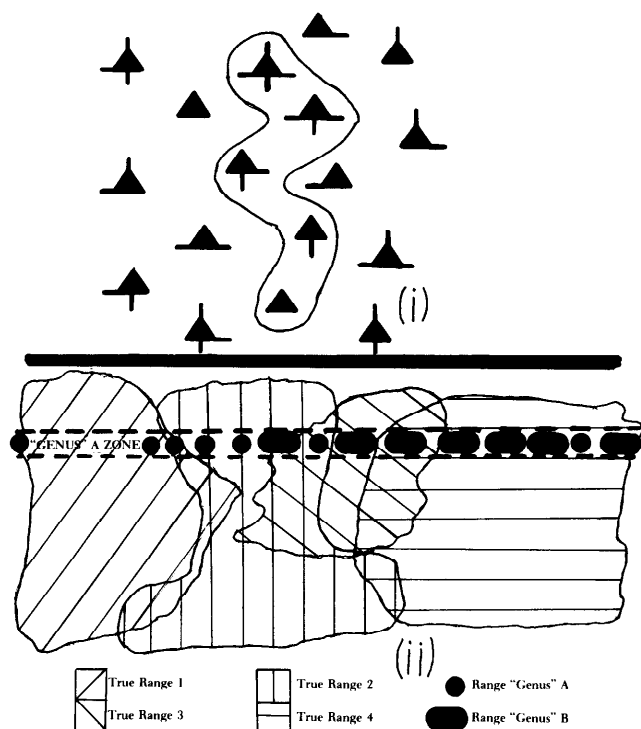


Figure 3. Taxonomic practices contributing to the fallacies of: (i) gradual (transition-filled) evolution within Cephalopod families, and (ii) world-wide zones of ammonoid genera.

distribution of fossils seem evolutionary. Extremely important is this fact: "Paleontologists have observed that rapidly evolving groups appear to have far less phenotypic variation than is true for more slowly evolving groups."³⁹ This low phenotype variation unmasks the taxonomic splitting which has artificially produced a seemingly transition-filled evolutionary trend. All relevant fossil evidence indicates that cephalopod groups were (and are) always distinct divine creatures (which never evolved).

C. Fallacies of Recapitulation as Illustrated by Cephalopods

The Biogenetic Law (ontogeny recapitulates phylogeny) can be readily tested because the cephalopod conch retains juvenile features, since the oldest septa remain throughout lifetime as part of the conch (oldest septa nearest the tip, etc.). Yet it has failed: "... 'recapitulation,' embraced uncritically by Hyatt and Buckman, c. 1870-1930, but found to be unwelcome, and now generally abandoned by ammonitologists."⁴⁰ Yet this matter is most definitely not merely historical, as many still believe it (for example Wiedman,⁴¹ many Russian paleontologists, and sporadically others: a specific use of it reviewed by Haas⁴²).

"... some lineages of Mesozoic ammonites exhibit little or no recapitulation."⁴³ Not recapitulation, but a whole spectrum of supposed relations between ontogeny and phylogeny is observed: Clark,⁴⁴ studying ammonoids, noted pedomorphosis⁴⁴ (adults having characteristics of ancestors' juveniles), acceleration⁴⁵ (juveniles with characteristics of adult ancestors), and caenogenesis⁴⁶ (animals differ when young, but are similar when adult). Cenogenesis also implies dissimilarity to related

forms, opposite of palingenesis (recapitulation). Yet supposed "... evolution could be either cenogenetic or palingenetic..."⁴⁷ But they admittedly cannot be distinguished; and: "Clearly one is involved in a *circular argument*; one cannot safely assume that palingenesis has occurred unless the course of evolution is already known."⁴⁷

Acceptance of recapitulation led to admittedly absurd logical conclusions: "The papers of the 2nd and 3rd decades of the 20th century, written in the recapitulationist faith, make strange reading now. If, as was often found, all the expected stages were not present in ontogeny, they must have been skipped; then the 'fact' that a stage had been skipped became itself of great significance, and forms were classed together because of characteristics which none of them possessed! All this was, of course, wrapped up in a scientific jargon..."⁴⁸

"The Biogenetic Law... had enough adherents among biologists to provoke repeated refutation, for example, by Sedgwick, ... Garstang, ... De Beer ... Biological critics argued largely from the *obvious fact that developmental stages do not usually resemble adult types*..."⁴⁹ (Paleontologists) "Pavlov and Spath opposed the universal application by certain paleontologists of recapitulation theory and drew attention to sequences of fossils which did not support it... The theory was abandoned by English ammonite workers by the end of the 1920's."⁵⁰

Yet a limited similarity trend does in fact exist between ontogeny and "phylogeny" (not evolutionary; but in reality the Flood-burial order). The to-be-discussed antediluvian marine ecological zonation had near-shore poorly-swimming, simple-sutured (low hydrostatic pressure resistance), nektobenthonic forms and offshore forms of opposite characteristics. During ontogeny, the first septa had simple sutures because of the hydrostatic capabilities of small septa sufficing; growing required acquisition of complexly-sutured septa for larger adult camerae. This ontogenic trend parallels the Flood-burial order ("phylogeny"): hence the "recapitulation." Since a developing complex cephalopod must be simple before becoming a complex adult, it may well resemble the simple, unspecialized, first-buried nektobenthonic forms; hence "recapitulation" of many other characteristics. Some shell ornament on advanced groups is for camouflage; younger forms being more benthonic and not needing it.⁵¹ The unornamented-then-ornamented-camerae ontogenic trend mirroring the nektobenthonic (juvenile)-then-pelagic (adult) lifestyle change in ontogeny parallels the nektobenthonic-then-pelagic Flood-burial trend: thus yet another common "recapitulation."

D. "Convergence" in Cephalopods as Evidence for Creation

Whenever very dissimilar living forms, obviously regarded as being different evolutionary lineages, resemble one another in some morphological attribute, this is termed "convergent evolution." Such cross-similarities are incredibly common among cephalopods: "The most striking feature that emerges from study of the Mesozoic ammonites from the evolutionary point of view is the frequency with which history

repeats itself . . .”⁵² “Examples of *striking resemblance*, both in shape and ornamentation between forms or even groups of ammonites of *quite different geological age* have long been known . . .”⁵³

Two examples of “convergence” at the generic level follow: “. . . the resemblance of *Euomphaloceras cornatum* (Kossmat) to *Plesiacanthoceras wyomingense* (Reagan) is striking indeed.”⁵⁴ *Trachyphyllites* resembled *Lytoceras* to such an extent that the former is now classed within the latter; formerly the similarity was ascribed to convergence,⁵⁵ and the former assigned to *Phylloceras*.

An example of family-level convergence is provided by *Idiohamites ellipticoides* Spath, whose ornament is identical⁵⁶ to those of family *Labeceratidae* (*I. ellipticoides* is of family *Anisoceratidae*). “Even in families widely separated stratigraphically and quite unrelated, shells with round or stout whorl section have similar sutures.”⁵⁷ “The openly coiled heteromorph ammonites such as the hamitids, crioceratids, and ptychoceratids still remain less well understood than most ammonites . . . The great degree of parallelism in ornamentation and homeomorphy among otherwise dissimilar heteromorph species has been recognized only recently.”⁵⁸ “In the Silurian, there is again a striking and, indeed a confusing, convergence between *Sthenoceras* of the *Phragmoceratidae*, and *Danoceras* of the *Oncoceratidae*.”⁵⁹

The following are some examples of ordinal-level convergence: “It is interesting to note that systems of radial lamellae developed repeatedly and independently in the siphuncles of several groups of cephalopods: . . . *Actinocerida* . . . *Intejoceratids* . . . *Oncocerida* . . .”⁶⁰ “A remarkable case of homeomorphy is the development of constricted (‘visored’) apertures of the *Phragmoceras*-type several times independently in entirely different lines of descent: . . . *ellesmerocerid* . . . *Discosorid* . . . *Oncocerid* . . .”⁶¹ “There is so much external resemblance between many *oncoceroid* and *discosorid* genera . . .”⁶² Four-lobed first sutures cannot any longer distinguish between orders since it is now known to appear independently in different ammonite lines.⁶³ Some of heteromorphs (meathook-shaped uncoiled conches) are of order *Lytoceras*, while others of *Ammonitida*.⁶³ Among subclass *Coleoidea*, “. . . sheath-like structures arose quite independently in the *Aulocerida*, *Belemnitida*, and Tertiary *Sepiida*.”⁶⁴

Class *Cephalopoda* converges with Class *Gastropoda*: “It is very much of a puzzle to separate cause from effect in contemplating the fact that certain only distantly related cephalopods acquired at different geologic times shells that were coiled in a helicoid spire like a gastropod instead of being straight or coiled in a plane as cephalopods normally are. Such situations are found in the nautiloids *Lechritrocheras* and *Trochoceras* of the Silurian and Devonian, respectively, the ceratite *Cochloceras* of the Triassic, and the Cretaceous ammonoids *Turritites* and *Emperoceras* . . . the convergence is thus heterochronous between different groups of cephalopods as well as between cephalopods and gastropods.”⁶⁵ Ward⁶⁶ adds that this is a “close convergence.” Septation on the monoplacophoran *Kirenella*¹⁶ is another convergence at the class level.

The convergence between Cephalopods and members of other phyla is without peer. Tests occur not only in Phylum Mollusca, but also Phylum Brachiopoda, *Fusulina* (of Phylum Protozoa), Bryozoa (Phylum Ectoprocta), and others.³ One of the most outstanding examples of convergence in the animal kingdom has to be that of the cephalopod eye and the vertebrate eye: “. . . every feature fundamental to its operation for vision in cephalopods appears to be encountered also in fish.”⁶⁷ The octopod statocyst (otolith) is much like that in vertebrates.⁶⁸ The open circulatory system found in most cephalopods nevertheless approaches the closed circulatory system found in vertebrates: the arterial muscle is difficult to distinguish⁶⁹ histologically in some cephalopods from that of vertebrates. Overall, Packard⁷⁰ contends that the similarity between cephalopods and fish is among the greatest of higher organisms in different phyla.

All of the above-mentioned examples of “convergence” are but a few examples of this cross-similarity which utterly permeates the Class: “Parallelism and convergence within the cephalopods, especially amongst fossil lines, are sufficiently common . . . to have made it difficult for an agreed classification to be reached even at the ordinal level.”⁷¹ The amount and extent of cross-similarity is thus so great that a great problem arises in separating primary similarities from secondary ones: “Indeed, relationships within the group are such that no tenable classification can be erected dividing the nautiloids into a few clearly defined morphological groups capable of a succinct definition. It is evident that neither the shape of the shell, the form and structure of the siphuncle wall, the presence or absence of actinosiphonate deposits, endocones, concavosiphonate siphuncles, annuli, or cameral deposits are in themselves necessarily a reliable guide to major taxonomic categories.”⁷² “Septa and sutures, like all other ammonite characters yet recognized—coiling, whorl shape, aperture, ribs, keels, furrows, etc.—are subject . . . to repetition of different variants at all levels in the phylogenetic tree and stratigraphic column. No single key to phylogeny has yet been discovered.”⁷³

Evolutionists, of course, explain convergence as being the result of evolutionary adaptation to a similar environment; or even direct competition (octopus evolving an eye because the fish with which it competed had them, etc.) Any major scientific-Creationist work may be consulted to document the fact that no grand bio-transformism (from mutations with natural selection, etc.) has ever been demonstrated (much less proved): the evolutionary hypothesis is therefore incapable of explaining (other than by unsubstantiated speculation) the origin of even one living morphological pattern, let alone the same pattern several times. Yet even if evolution occurred, “Given the indeterminate nature of inherited variability it would be more natural to expect new characters to be unrepeatable even in the case of the adaptation of closely related organisms to similar environmental conditions.”⁷⁴

Pertaining specifically to cephalopod “convergence,” evolutionists claim that evolution would repeat because there are only a few theoretically-possible designs. This point is controversial. Raup⁷⁵ attributes the narrow

parameters of conch geometry to optimum survivability, but this is speculative and he was uncertain as to the cause of limitations on some parameters. Even many theoretical phyla could exist.⁷⁶

It isn't the Creationist who must explain why the Creator would create "such a bewildering variety of similarly-living forms" as some evolutionists have charged. God designed His creatures for differences in glory (1 Corinthians 15:38-41). Life is not evolutionarily diverse, but in reality of a very limited, Divine-designed diversity which strays not far from taxon "blueprints." The convergence among cephalopods reflects a high degree of mixture of design features in all forms: "Heterochronous convergence" suggests that geologic-time designations to the fossil record are false: all fossil/extant forms Created simultaneously and mutually contemporaneous.

II. Explaining Ammonoid Biochronological Horizons: a Challenge for Diluvology

Introduction: Demonstrating that the fossil record does not support evolution is only half of the Creation-Flood paradigm: the other half (which occupies the remainder of this work) is to provide scientifically-based explanations for the order of Cephalopod burial by the Flood as is observed in the fossil-rock column.

It is necessary to determine just how much true stratigraphic order the fossil record has: evolutionists-uniformitarians frequently claiming that fossil succession-order is too precise to be explained by anything other than evolution with long ages. Since ammonoids are indisputably the best index fossils, unrivalled in the Mesozoic and useful in the Upper Paleozoic, their successional order must be carefully examined. The Jurassic Period alone is claimed to have been biostratigraphically divided into 52 worldwide successional ammonoid-genera zones.

"The motives and procedures of biostratigraphy are: 1, the collection and description of taxa; 2, the identification of local assemblages in rock sequences (assemblage-zone); 3, the measurement of the total stratigraphic range of significant taxa (range-zones); 4, the definition and recognition of time units based on the stratigraphic range of fossils (Period, Ages, etc.); and 5, the calibration of the biological time scale by isotopic and other numerical dates."⁷⁷ Obviously biostratigraphy, and especially that of ammonoids, is the combination foundation/backbone of the uniformitarian geologic column. One zone not mentioned is the acme-zone, or zone of abundant occurrence of a given taxon.⁷⁸ Legendary are the mid-19th century stratigraphers Albert Oppel and Alcide D'Orbigny for setting up the above-mentioned zones from ammonoids in Western European rocks.

A. The Substantial Subjectivity of Fossil "Species" and "Genera"

Many paleontologists now agree that "... the assignment of groups of organisms to taxonomic categories involves a large element of subjectivity ...,"⁷⁹ and Shaw⁸⁰ states that "... the species concept is *entirely subjective* ..." He (quite radically) advocates that designating fossil species be entirely abandoned and

replaced by a stratigraphy of morphological attributes because the designation of fossil species depends on what the individual paleontologist considers significant,⁸¹ frequently lumping objective differences as variation.⁸² It is not difficult to see that true species have wide degrees of intraspecific morphological variation,⁸² so "fossil species" could hardly be recognized. Although cephalopods preserve their juvenile septa, Mapes⁸³ nevertheless recently warned that mistaking juvenile and adult forms "... can and has led to confusion in the literature."

It is not so much "fossil species" as "fossil genera" of ammonoids that are employed in the hair-splitting subdivision of geologic ages. Yet: "When ammonites are considered in the context of the whole invertebrate fauna, which is rarely done, it becomes apparent that ammonite "genera" frequently have the status in terms of morphological variation, of what generally are regarded as species in other groups."⁸⁴ The above-mentioned criticisms of fossil species would then apply to "fossil ammonoid genera." It is not uncommon for "genera" to be recognized, named, and allowed to define zones on the presence of but single specimens, as in a case which was condemned.⁸⁵ Many so-called genera have been drawn into synonymy by treating their differences as sexual dimorphism;⁸⁶ but this may actually be polymorphism,⁸⁷ similar to the type found in some hymenopteran insects. This would then be another major element of speculation, internal inconsistency, and arbitrary practice used in designating ammonoid genera, irrespective of whether the "genera" were so when living or if the generic label is only considered operational.

After reviewing the study of Cretaceous ammonites, Haas⁸⁸ called attention to "... the indistinctness of the hitherto assumed generic characters ..." The Cephalopod paleontologist Wiedman⁸⁹ noted that counting the number of genera is "surely unreliable." Twenty years of study have reduced the number of Lower Lias (Jurassic segment) ammonite genera from 106 to 76.⁹⁰ No isolated instance; the amendment of the very plastic generic designations is routine: "The evolutionary diversity of the ammonoids ... has been exaggerated by ... dubious theories of descent which have led to unnecessary multiplication of generic names. Close study of a fossil group *almost always reduces the number of valid species or genera*; for example ... genera in the family Echioceratidae ... reduced from nineteen to five."⁹¹ An example of ammonoid species subjectivity is provided by the genus *Sonninia*, of which 70 species have been reduced to only 2,⁹² and of these 64 reduced to but 1.⁹³ Even family-level subjectivity is a fact, illustrated by the shifting of *Fanninoceras* from the family Hildoceratidae to the Oxynoticeratidae.⁹⁴

The bearing of the subjective nature of specific and generic designations upon biochronology is best given by Hess,⁹⁵ who asks: "Could not ... shaky or non-precise nature be attributed to the biostratigraphic methods ... when stages or zones are defined and mapped, for example in the Middle Jurassic, on the basis of the presence of fragmentary ammonite material, which at the time served as holotypes for a dozen new genera and species just to commemorate the name

of the investigator?" How all the subjectivities discussed in this section relate to the assignment of "genera" into zones will be discussed in a later section.

B. Procedures Which Eliminate Successional Discrepancies

This section studies some methods by which fossils found where they are not "supposed" to be are effectively eliminated, making the successional order of ammonoid fossils appear much greater than it really is, and reinforcing claims of consistent successions.

It must be realized, first of all, that "genera" which are used to support uniformitarian claims of a very precise worldwide biostratigraphic "onion skin" system of tens of successions per geologic age are selected from many of varying stratigraphic range. Even if the "genera" used in world-biostratigraphic claims were objective entities, there is still a considerable overlap of cephalopod fossils in the geologic record. Many examples of long-ranging forms exist. The genus *Bactrites*, for example, ranges from Silurian to Permian,⁹⁶ and many consider it to be nothing more than a straightened-out ammonoid. "The Phylloceratina are . . . almost unchanged through the Jurassic and Cretaceous . . ."⁹⁷ Some significant morphological attributes, such as the ten-arm tentacle structure found in modern squids and shown by trace fossils⁹⁸ to have persisted since the early Paleozoic forms, span the uniformitarian geologic column.

Many so-called genera of supposed short stratigraphic range are found to have longer ranges, and some of these are then discarded in future claims of precise world successions. In the Spanish Jurassic "The stratigraphic range of some genera was found to be more extensive than previously known."⁹⁹ The French Jurassic zones of *Macrocephalites* and *Reineckeia anceps* now admittedly overlap, and these "biostratigraphic anomalies observed repeatedly in the Callovian cannot always be explained by faunal 'remaniement.'"¹⁰⁰ "In the lower Triassic, the *Flemingites* zone is overlain by the *Owenites* zone, but now many characteristic Owenitan "genera" are found with *Flemingites*.¹⁰¹ *Leioestegium*, once thought to be a distinctive Canadian-stage genus, is now known far into the overlying Demingian stage.¹⁰² Stratigraphic-boundary controversies test accept fossil-ranges and often prove them vastly incorrect, as did the Permian-Triassic boundary perplexity: "*Cyclolobus* is regarded as an indicator of latest Permian rocks . . . but . . . now presented evidence . . . that *Cyclolobus* makes it appearance well below the top of the Permian . . ."¹⁰³

Fossils which are found where they are not "supposed" to be as part of an inviolable biochronological order are likely to be completely ignored. It took nearly 120 years after an original find (1843, Belgian Devonian) before Belemnoids were recognized to appear that early; previously they were believed to be no earlier than the Triassic. Concerning that early find, ". . . For nearly a century this report has been generally ignored or discounted."¹⁰⁴ Pertaining to a century-later Mississippian find: ". . . a report which has met with skepticism, though no good basis for this incredulity has been expressed. One can only conclude that the lack of widespread acceptance . . . stems from a widely-held

conviction that there are no belemnoids as old as the Mississippian . . ."¹⁰⁴ Although rare in the Paleozoic,

Fossils which are found where they are not "supposed" to be as part of an inviolable biochronological order are likely to be completely ignored. It took nearly 120 years after an original find (1843, Belgian Devonian) before Belemnoids were recognized to appear that early; previously they were believed to be no earlier than the Triassic. Concerning that early find, ". . . For nearly a century this report has been generally ignored or discounted."¹⁰⁴ Pertaining to a century-later Mississippian find: ". . . a report which has met with skepticism, though no good basis for this incredulity has been expressed. One can only conclude that the lack of widespread acceptance . . . stems from a widely-held conviction that there are no belemnoids as old as the Mississippian . . ."¹⁰⁴ Although rare in the Paleozoic, the Belemnites are easily recognized (by their bizarre bullet shape); and since they have no value as index fossils—it is difficult to see why their early appearance was not recognized. This non-recognition is a dramatic example of how fossils which do not fit preconceived notions of their stratigraphic range may be blindly ignored. The successional order of ammonoids (which, in contrast to belemnoids, are not easy specifically to identify) is greatly exaggerated because there are no doubt many "out-of-place" forms ignored.

More commonly they are not ignored, however; the "out-of-place" fossils are given different names. In making identification, there is needed ". . . an evaluation of all characters, *taken in conjunction with stratigraphical evidence*, in making a classification."¹⁰⁵ In fact, classification ". . . depends *absolutely* on stratigraphical information."¹⁰⁶ Clearly then, the identification and classification of "genera" is not independent of their claimed successional status, and the same fossils often are given different names, depending on their stratigraphical position.

An exceedingly common rationalization for "out-of-place" fossils is the concept of "migration"; the claim being that ". . . many different lineages were evolving and migrating simultaneously and so the succession is bound to vary in different places . . ."¹⁰⁷ Pertaining to worldwide correlations, the "migrations" ". . . created a very complex faunal pattern."¹⁰⁸ Another result was contradiction between the successional order of ammonoids and other index fossils: "A number of pelecypods, gastropods, and brachiopods enter the North American succession at a lower horizon than in Europe."¹⁰⁹ The finding of given "genera" among other specific "genera" of different "age" (and explained as "migration") is so common that Hedberg¹¹⁰ advocates that biostratigraphic and chronostratigraphic designations not be used interchangeably.

C. The Scattered—Not Worldwide—Distribution of Fossil Zones

Arkell¹¹² categorically states that no "worldwide" ammonoid zone is *de facto* worldwide: Schindewolf¹¹¹ adding that it is a time concept which makes it worldwide, not presence of particular genera. ". . . Zones . . . do not apply universally. For instance, no one can recognize the rocks belonging to Kosmoceratan, Quenstedtoceratan, or Cardioceratan 'ages' in the

southern hemisphere, where these genera do not exist. It is, however, possible to recognize the Callovian and Oxfordian stages, because those are abstractions, not dependent on occurrence or absence of any particular index species or index genera, but recognized by the general grade of evolution of the ammonite fauna as a whole and by a chain of overlapping correlations carried link by link around the world."¹¹² Similarly, in the Cretaceous, "The zones of the standard European section cannot be set up in Texas with any great accuracy. Instead, a parallel zonation must be set up in each area, and a correlation estimated, on rarely occurring fossils, stage of evolution, homotaxial superposition of family and generic groups, and intuition."¹¹³ In Montana, *Inoceramus stantoni* Sokolov is an index to the *Scaphites depressus* zone.¹¹⁴ Fig. 3(ii) illustrates the fallacy of worldwide "onion skin" zonal claims: the zone of ammonoid "Genus" A seems worldwide only because "Genus" B is considered to be a stratigraphic time equivalent.

"Another interesting example of confusion resulting from lumping two concepts under one set of terms is evident in the common usage of the term 'Fossil zone,' *Fulanus smithi* Zone for example. Thus, one group of paleontologists would interpret *Fulanus smithi* Zone as the body of strata characterized by a certain assemblage of fossils of which *Fulanus smithi* happened to be a prominent member. Another group would understand *Fulanus smithi* Zone to mean the total body of strata in which the species *Fulanus smithi* occurred regardless of its associates. (Moreover, in neither group would there be uniform opinion as to whether actual specimens of either *Fulanus smithi* or the assemblage fossils would have to be present for strata to be included in the zone, or whether simply supposed time equivalence would qualify strata for inclusion)."¹¹⁵ Zonal claims hide under vague terminology.

Not only are there no nearly worldwide "genera" zones and rather a woven quilt of imagined time equivalences; but also fossils tend to be absent in the most unlikely places: "... barren segments may intervene between definable zones."¹¹⁶ Pertaining to Jurassic ammonoids, "It is remarkable that some species abundant in one locality are rare or absent in others of the same region."¹¹⁷ Speaking of surprising absences in intercontinental ammonoid correlation, von Hillebrandt¹¹⁸ notes: "These observations illustrate the difficulty of biostratigraphic correction." A criticism of existing Triassic biostratigraphy notes "... in large part a hypothetical arrangement of zones defined in widely scattered areas."¹¹⁹ Just as there are missing geologic "ages" with no unconformity to indicate the supposed tens of millions of years of nondeposition/erosion, so also there are frequent mini-disconformities; for example, between the Toarcian and Sinemurian stages, "Although the section ... is seemingly continuous, Pliensbachian ammonites ... appear to be missing."¹²⁰

Zones and even stages are such arbitrary designations that they can easily be dissolved at will. For example, a newly-constructed Cenomanian-Toarcian boundary does away with the *Belemnites plenius* zone,¹²¹ whereas the

long-held Volgian stage of the Jurassic is recommended to be dropped.¹²²

Ammonoids (especially in the Upper Paleozoic) are used with other index fossils, especially conodonts and brachiopods. Conodonts may be found far from where they stratigraphically "belong"; and "reworking" of older rocks' fossils into more "recent" ones is claimed. But in a recent Kansas case of Devonian conodonts in Mississippian rock, "Specimens exhibit *little evidence of reworking*."¹²³ "Brachiopods are notoriously difficult to use in correlation, and Permian ones especially so because of their provinciality ..."¹²⁴ Not trivial, but major contradictory age-indicators may result from different groups over wide regions, as in this Eastern Siberian example: "The same deposits were long classified as belonging to the Carboniferous on the basis of ammonoids, and to the Permian on the basis of brachiopods and other groups."¹²⁵ (The ammonoids proved right.) Biostratigraphic subdivisions are calibrated by radiometric dates to produce the numerical uniformitarian geologic time scale. Yet "Only very few useful Jurassic radiometric dates are available, and the biostratigraphic position of most of these is vague."¹²⁶ "Radiometric dates for the Lower Cretaceous are scarce, and nearly all are based on glauconites which become less reliable with increasing age of the section."¹²⁷ "The expressed cautions on choosing the radiometric dates and their scarcity only further arouse suspicions that isotopic dates are accepted only if they agree with the biostratigraphic distribution and support and old earth. Biostratigraphic/magnetostratigraphic relation is vague."¹²⁸

D. Biochronologic Ammonoid Zones as Taxonomic Concoctions

Not only are the "Worldwide" zones not worldwide and in reality a "patchwork" of supposedly isochronous lateral equivalents, but (as this most-important section will show) the previously considered subjectivities of ammonoid "species" and "genera" are universally manipulated in a way that makes even the lateral-component "patches" appear far more geographically widespread and—more importantly—thinner (shorter stratigraphic range) than actual ammonoid genera were.

The fact that cosmopolitan genera appear over-represented in the fossil record¹²⁸ suggests concoction that makes them appear cosmopolitan. Ager,¹²⁹ in agreement, states that ubiquity of fossils is often actually paleontologists' imagination, and that geographic distribution of fossils parallels political boundaries. "Taxonomists have long known that geographically widespread species tend to display far more variation than is the case with highly endemic species of the same genus or family."¹³⁰ Concerning Texas Cretaceous ammonoids: "The endemic faunas exhibit lower generic diversity than the cosmopolitan ones."¹³⁰ "The high variation observed within 'cosmopolitan genera' is only the natural result of the lumping of different fossil forms into the so-called genus to make it appear geographically wide-spread.

Similarly, taxonomic splitting makes "generic" successional-order highly exaggerated, both in precision and repetitive consistency. "Thus all 'horizontal'

generic, specific, or intraspecific boundaries in paleozoology are *artificial cuts* in uninterrupted 'vertical' evolutionary lines which are *intended to serve the practical ends of biostratigraphy and geology*."¹³¹ "We are . . . acutely aware . . . of the arbitrary decisions and disparity of methods among taxonomists. The clade statistics reflect the true history of groups only through these filters. Clades of genera within families for Mesozoic ammonites, for example, are extremely short and fat . . . *prodigious oversplitting* inspired by *stratigraphic utility* may be the primary cause of these unusual shapes."¹³² Hallam,⁸⁴ Campbell and Valentine,¹³³ and others all call attention to this vertical taxonomic splitting of ammonoid genera.

All of the following are examples of ammonoid-"genus" splitting, starting with the Permian: "Definition of *Cyclolobus* involves a progression of evolutionary stages within the family in which *Timorites* . . . is the immediate predecessor. Separation of these two genera is *arbitrary*."¹³⁴ "*Glyptophraceras*, *Ophiceras*, and *Otoceras* of the lowermost Scythian are extremely plastic stocks. Nearly every researcher who has worked with these genera has testified to this fact."¹³⁵ A survey of the Triassic notes: "*Tropites* . . . the limits of this genus are indefinite."¹³⁶ There is in the Cretaceous an (upward) succession of *Scaphites depressus*, *S. binneyi*, *S. vermiformis*. In this succession a split occurred because *S. binneyi* was once regarded as just a variety of *S. vermiformis*."¹³⁷ Another important problem that arises in recognizing first occurrences of taxa in an evolutionary sequence and their subsequent use in correlation is the discrepant taxonomic practices of different workers. As an example, one worker may place the first stratigraphic occurrence of a taxon where one-half or more of the sample contains the diagnostic morphologic attribute. A second worker may, with the same data, choose the first occurrence of the diagnostic attribute at the level of its first appearance, no matter how small a part of the sample it is."¹³⁸

All of the considered factors contributing to the illusion of inviolable ammonoid succession-order are summed up in Fig. 3(ii). Selective lateral lumping has fused true genera 1 to 4 into "genera" A and B. A and B, imagined to be time-equivalents, thus comprise the "worldwide" ammonoid zone A. Extreme vertical splitting simultaneously makes both A and B seem very successional (thin, precise, "onion-skins") which in reality are small vertical segments of true genera 1 to 4. Several such zones (all arbitrary, fallacious, taxonomic concoctions) are superposed to define a stage; several stages make up a geologic "period." The fallacies snowball and culminate in the uniformitarian geologic age system. Diluviology need not be burdened with claims of these precise generic successions, as much of this order is imaginary. The order which does exist in the stratigraphic record will be explained in terms of Flood-depositional sequence.

E. "Condensed" Ammonitiferous Deposits Indicate Rapid Burial

Evidences for cataclysmic sedimentation, commonly studied in Diluviology, are excellently manifested among cephalopods. Kranz,¹³⁹ following an experimental study of the burial of mollusks, concluded that only

rapid burial will preserve a fossil in the first place. "The attractive preservation of many of the ammonites, in particular, is due to pyritization."¹⁴⁰ Pyritization results from reduced-iron conditions caused by bacterial decomposition of pre-fossilized material, the decay of which was halted by rapid burial and culminated in fossilization.

Not only do well-preserved ammonites reflect rapid burial, but poorly preserved, crushed conches do likewise. Crush-fractures often reveal¹⁴¹ that the conch was flattened before fossilization (before the aragonite recrystallized into calcite). This indicates that conches were not only rapidly buried but also were quickly covered by a heavy overburden of superjacent sediment.¹⁴²

These evidences, however, do not deflate the astronomical-time claims of uniformitarian geology nearly as thoroughly as do thin, ammonite beds containing mixtures of different "age" fossils called condensed beds, a unit of but little thickness in which faunal elements of various ages occur side by side without being any longer separated stratigraphically. Such deposits occur in varicolored, cephalopod-bearing limestones of many Tethyan localities, such as, in the Triassic, at five localities in the Hallstatt limestones of the northern calcareous Alps, one each in Bosnia and Greece, in the Himalayas and on Timor; in the Jurassic, at eight localities of the northern calcareous Alps, four in the southern Alps, seven in Hungary, and one in western Sicily."¹⁴³ In Italy, "Paleontological condensation occurs frequently in these deposits . . ."¹⁴⁴ In the Bajocian (mid-Jurassic) of Midlands, England, are ". . . thin and condensed sequences . . . non-sequences . . . all these are characteristic, even in the basins."¹⁴⁵ These condensed deposits are ". . . thin layers of clay or limestone crowded with ammonites from more than one horizon."¹⁴⁶

"Condensed" beds are this thin: one Himalayan bed spans 7 ammonite zones (7-10 million supposed years) in merely 3 feet of sediment.¹⁴⁷ Heim¹⁴⁸ calls attention to a glauconitic sandstone 10-80 cm. thick with ammonites from ten horizons. In Sicily, there are ". . . 30 ammonite zones represented in one foot of sediment . . ."¹⁴⁹

The common uniformitarian explanation is that "Condensed deposits are formed by stagnant sedimentation and reworking causing faunal elements of various ages to occur side by side."¹⁵⁰ Ammonoids of millions of years' duration are imagined to fossilize with little or no sediment and accumulate fossil-by-fossil at the ancient sea-bottom, the sediment accumulating to only a negligible degree (inches or feet in millions of years) and/or being washed away. Ammonoids thus supposedly separated by millions of years' time coexist within inches or are mixed outright.

A number of factors make the uniformitarian explanation incredible. "To maintain an unchanging environment for such long periods suggests conditions that could only be provided in the deep sea."¹⁵¹ Yet there is evidence for current action,¹⁵² and because of these and other strong evidences, Jenkyns¹⁵³ concludes non-tranquil shallow-water deposition. Reworking is claimed on grounds of abrasion, corrosion, etc., of fossils. Many non-condensed, "properly" sequenced

ammonoid fossils show these features, and in "condensed" beds actually "... occur in various states of preservation..."¹⁵⁴ "One of the arguments adduced against reworking... for the west Sicilian Jurassic is that the older faunal elements in a 'Condensed' assemblage are often as well preserved as, and sometimes better than, the younger."¹⁵⁵ As a matter of fact, "... the best fossils are in the thinnest sequences..."¹⁵⁶ While the differences of mineral matrices in "condensed"-bed fossils are used to support reworking, many others are "... indistinguishable by the matrix."¹⁵⁷

Far more significant are questions of prolonged preservability. Even if ammonites fossilized without sediment, continuously accumulated, and this condition persisted undisturbed for millions of years, they would have miraculously to survive countless episodes of current action, being mixed around many times to incorporate million-years-later ammonites with them. Mass-preservation despite millions of years of turbation associated with reworking would have had to have occurred since "Ammonites may occur in *immense concentrations* in the condensed beds."¹⁵⁸ It is highly reasonable that these highly-fragile fossils would all be ground to powder, incapable of surviving even a few reworkings, let alone countless episodes spanning millions of years.

Many other evidences for short-duration "condensed"-bed deposition exist. If many "condensed" limestones are biogenic in origin, an argument from ignorance is required to explain their scarcity of nanno-organisms.¹⁵⁹ Also, evolution fails: "It is... remarkable that... genera, such as *Physodoceras*, *Amoeboceras*, *Glochiceras* continue to range through the condensed beds without change."¹⁶⁰ Calcareous concretions in "condensed" limestones may be from decaying organic matter,¹⁶¹ indicating sudden stoppages in the decay process (as happen during fossilization). "It is worth considering that although the condensed sequences represent vast periods of time, the stromatolitic laminae may be at most an annual or even a *noctidiurnal* phenomenon... and hence the growth of an algal clump could take place very fast. Hence, some factor must control the growth (or preservation) of the stromatolites since these horizons are of such limited vertical extent."¹⁶² The "factor" is the fact that "Condensed" beds are of short-durational formation.

One of the lesser implications of "condensation" is the wholesale upsetting of elaborate biostratigraphic zonations: "In the Triassic of Europe and Asia, where most Triassic ammonoid genera were first discovered and named, two kinds of problems confront the paleontologist concerned with recognizing natural assemblages... The Triassic rocks in Tethys... provide mainly frustration for the ammonoid zonal stratigrapher."¹⁶³ Discrepant fossil presences are mitigated by "condensation," as in this Hungarian Jurassic case: "The author is inclined to... explain the occurrence of 'strange' forms with a mixture of faunas in its lower part and with faunal condensation in the upper."¹⁶⁴ In the Permo-Triassic boundary-controversy, the observed mixing of the *Otoceras* and *Ophiceras* zones is ascribed to "condensation."¹⁶⁵

The "Condensed" sequences have an infinitely greater significance than that of mixing biostratigraphic horizons. Once "condensed" sequences are seen to be rapidly deposited, the result is nothing less than the complete collapse of all the uniformitarian time-claims ascribed to the fossil record. "Condensed" beds may potentially become the most powerful overall evidence for the cataclysmic, mutually contemporaneous, short-duration burial of the entire fossil record. This is because all the mixed ammonoids must have lived at the same time and have been cataclysmically buried at the same time. Correlation of these "condensed" beds may "condense" most of the Mesozoic, deflating its sedimentation time from hundreds of millions of years to only several weeks (the closing phases of the Noachian Deluge). Without the thin, "condensed" sequences and their mutually-coexisting ammonoids representative of widely-different age-designations, one would need a miraculously long, upright tree trunk extending through miles of sediment of all geologic ages so unequivocally to demonstrate cataclysmic burial with mutual contemporaneity of all fossils.

Weidenmeyer¹⁶⁶ points out that "condensed" beds are often associated with penecontemporaneous tectonism and sedimentation. The high proportion of condensed beds in mountains (especially the Alps) reflects disturbed Flood-burial patterns caused by Floodwater flow-off variability around emerging mountains.

III. The Stratigraphically-Ordered Flood Burial of Cephalopods

A. Ecological Zonation and the Deluge: Preliminary Considerations

The factors causing stratigraphic order in Flood burial most often studied in Diluvology include hydrodynamic selectivity, differential escape possibilities, etc. (emphasized by Whitcomb and Morris¹⁶⁷) and also ecological zonation (emphasized by Clark¹⁶⁸). The latter consideration is more likely to have been the major factor in the desposition of the Cephalopods during the Universal Deluge owing primarily to the fact that the cephalopods show a striking stratigraphic eco-pattern.

Extremely significant is this overall fact: "It is worth mentioning that *continuous 'evolutionary' series derived from fossil record can in most cases be simulated by chronoclines*—successions of a geographical cline populations imposed by the changes of some environmental gradients."¹⁶⁹ Thus uniformitarians agree that ecological, not evolutionary factors, can definitely give rise to orderly successions! In speaking of evolutionary vs. ecological fossil-successions, Bell¹⁷⁰ even remarks: "There is, I think, no widely accepted belief in geology that so stultifies paleontologic interpretation as does the belief that successive faunal assemblages in a succession of rocks can be interpreted *only* as comprising species that succeed each other in time." (emphasis his) He also notes that it is very difficult to distinguish between ecologic and evolutionary successions, especially without unconformities, radiometric dates, etc.¹⁷¹ Once it is accepted that none of these—and other—evidences is valid, and consequently neither geologic time nor biological evolution have any basis, all successions may be viewed as primarily ecological: not merely eco-

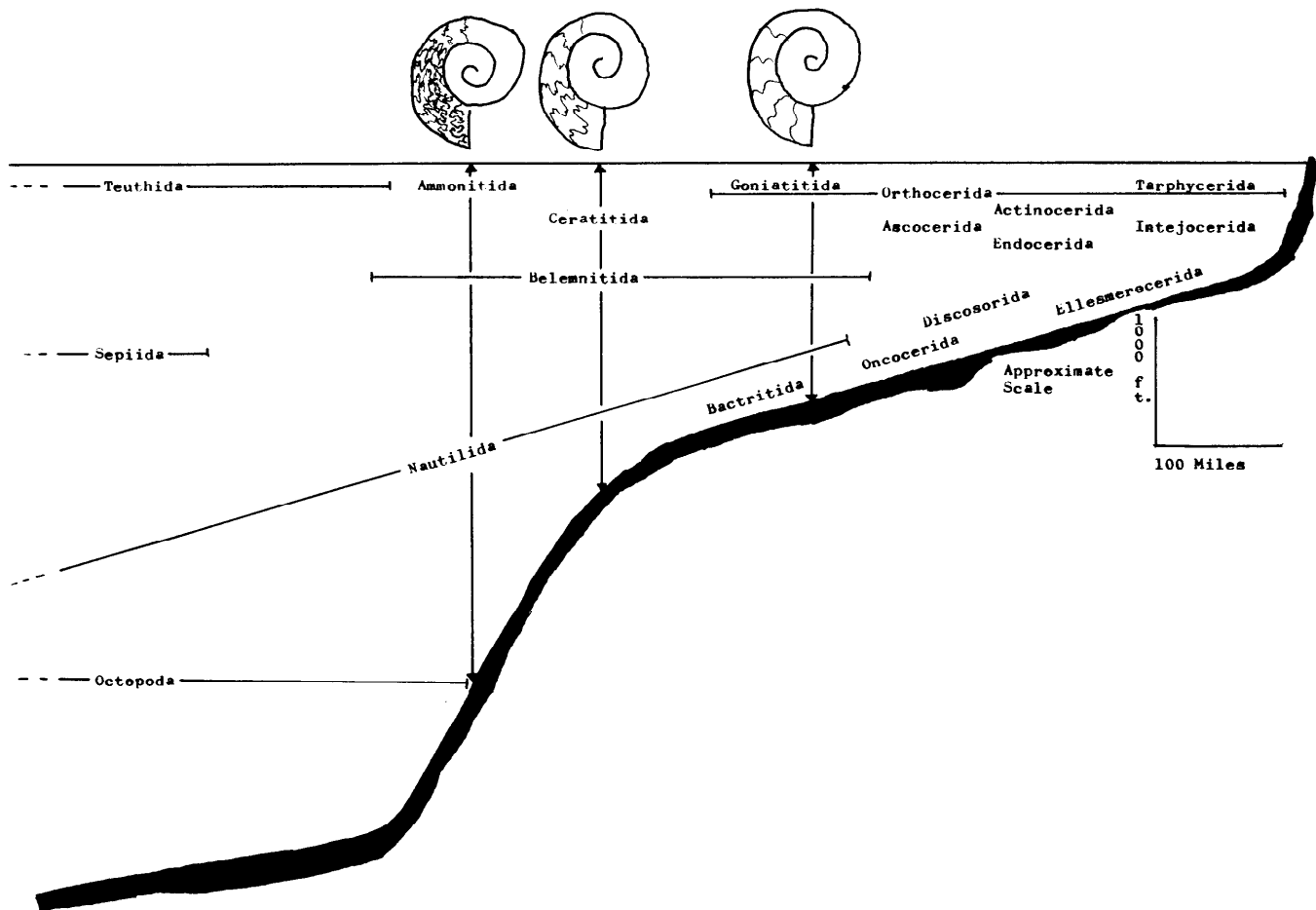


Figure 4. The ecological distribution of Cephalopods in the antediluvian seas: a representative cross-section.

successions, but contemporaneously-living Flood-buried successions. One recent example of non-evolutionary but ecological succession is provided by Thayer,¹⁷² who noted an upper Devonian supposed deltaic progradation causing an ecological succession mimicking evolution.

In mixing evolution-time with ecology (paleoecology), such a practice relies heavily on deductive, *a priori* ecological designations: "... a useful approach is to assume a given theory from community and population biology and then to infer what the community would have been like had it obeyed the requirements of the chosen theory."¹⁷³ Testing such a designation is not conclusive: "Rather, paleontological tests are often simply clues that suggest the likelihood of verification or falsification from evidence that cannot be definitive."¹⁷⁴

Many evidences suggest that paleoecological designations lumped with supposed time are not real. In noting, for example, hierarchical completeness, "... in general, the completeness decreases at each higher step; at the community level ... many (individuals) are missing, and many populations are missing completely ... at provincial and biospheric levels th³ holes are progressively worse ..."¹⁷⁵ These gaps suggest that these are not *in situ* fossil communities but Flood-modified groups. Bambach¹⁷⁶ reviews the widely (but not univer-

sally) held view that diversity among all fossils was considerably less than it is today; Teichert and Glenister¹⁷⁷ cite the same for cephalopods. Abnormally low diversity is inevitable as long as actually contemporaneous forms are artificially divided into time-partitioned paleoecological designations.

B. The Antediluvian Ecologically-Zoned Coexistence of Cephalopods

Fig. 4 illustrates the original ecological distribution of the Cephalopods, from the Creation until the Universal Deluge. The Cephalopods, as other marine creatures, were created on the fifth day of the Creation Week (Genesis 1:20-23); entire populations coming into existence out of nothing (Romans 4:17d) at God's command (Psalm 148:5b). Since God designed each part of the individual organism to have a specific function that works as a whole (1 Corinthians 12:14-26), it is easy to envision Him having created different types of Cephalopods, each designed for a specific ecological habitat.

A study of present-day marine ecology notes that by far the main factors involved are the depth to which an organism goes, its distance from the shore, and whether it is a floater (planktonic), active swimmer (nektonic), or bottom-dweller (benthonic).¹⁷⁸ Exactly the same trends are observable in the stratigraphic record. Once the fallacies of evolution and geologic time are rejected

and mutual contemporaneity accepted, the stratigraphic-upward ecological trends fit perfectly together as part of one vast ecologically-zoned cephalopod distribution (Fig. 4). Of even greater significance is the fact that the scientifically-determined ecological positions of cephalopods are (going stratigraphically upward) virtually identical with expected stratigraphic-upward trends of Flood burial (nearshore-then-offshore; benthonic-then-nektonic, etc.).

Overall trends are as follows: Fisher³ calls attention to the stratigraphic-upward trend of heavily-conched to lightly-conched to conchless (squids). "Poorly streamlined shells . . . do not become common until post-Devonian times. Poorly streamlined and well streamlined shells are both common throughout the late Paleozoic and early Mesozoic, but after the Jurassic well streamlined shells become dominant."¹⁷⁹ (Hence there is benthonic-to-nektonic stratigraphic-upward trend.) Another important trend, noted by Packard,¹⁸⁰ is that the early cephalopods lived in water considerably more shallow than presently-living types; an overall stratigraphic-upward trend towards life in progressively-deeper water is noted. These overall trends are but the general outline of the antediluvian ecological distribution (Fig. 4).

Even greater support for Figure 4 is provided by more specific ecological positions of the cephalopod orders. According to Cowen,¹⁸¹ Cambrian forms were primarily deposit-feeders; roaming scavengers appear in the Ordovician. The following were the ecologic positions of the Endoceratoids, Actinoceratoids, and Nautiloids: The Ellesmerocerida, Oncocerida, and Discosorida are rated as benthos.¹⁸² The Endocerida, Intejocerida, and Ascocerida are nektobenthos.¹⁸² A nektonic rating is given to orders Actinocerida, Orthocerida, and Tarphycerida.¹⁸² Donovan,¹⁸³ agreeing that early Paleozoic forms were benthonic, adds that these forms were capable of neutral buoyancy and therefore capable of some swimming; a conclusion more recently confirmed.¹⁸⁴ Thus these early groups were not totally benthonic and could have been transported onto land during the early Flood stage.

"The earliest nautiloids, with peripheral siphuncle but concave septa, were probably confined to shallow water . . . as confirmed . . . from a different line of reasoning."¹⁸⁵ The ammonoids lived further offshore than the above-discussed early forms,¹⁸⁶ justifying the lateral separation portrayed in Fig. 4; the above-discussed ecologic findings already vertically grouping in early forms. The Bactritids were nektobenthonic as were the earliest ammonoids.¹⁸⁷

A most important stratigraphic-upward trend is that of progressive septal corrugation in the ammonoids: ". . . the appearance of an intricately curved septum and its corrugation at the point where it articulates with the shell wall (in the places where stresses are the greatest); which are obvious adaptations enabling the septum to withstand high pressures."¹⁸⁸ This is generally regarded as the best explanation for this corrugation-trend.¹⁸⁹ Many independent groups show such a trend.¹⁹⁰ The stratigraphic-progression is as follows: the goniatites, (Figs. 2, 4 conch-suture diagrams going away from the shore) characteristic of the Paleozoic,

have a non-corrugated septal morphology (and thus an undenticulated suture-pattern); the ceratites (Triassic) have some denticulation of sutures from slightly-corrugated septa; the ammonites (Jurassic and Cretaceous) have totally denticulated sutures reflecting total corrugation of their septa.¹⁹¹ This supposedly evolutionary trend may instead be readily viewed as being mutually-contemporaneous designs for varying depth-capabilities: ". . . elaboration of sutures would denote adaptation to active swimming habitats in deep water, and simplification of sutures would imply . . . shallower waters, or sluggishness."¹⁹²

The fact that the complexly-sutured ammonites are heavily ribbed¹⁹³ to withstand greater hydrostatic pressure further corroborates the fact of their greater depth capacities as compared with simple-sutured forms.

The calculations of Heptonstall¹⁹⁴ on the weight burden of attached oysters on ammonites strongly indicates that ammonoids must have been capable of adding and removing water from their septa to regulate buoyancy as does the extant *Nautilus*. Overall, "It might . . . be possible that the primary mode of life of the ammonoids involved the need for continual adjustments to a pressure gradient. There is some indirect evidence for this interpretation."¹⁹⁵ The small teeth and the shape of jaws of ammonoids is one such evidence of plankton-feeding habits that require vertical migration. In addition, ". . . most ammonoids were fairly efficient at moving themselves vertically but less efficient as swimmers."¹⁹⁶ The heavy vertical lines spanning the water surface and sea-bottom (Fig. 4) illustrate how progressively more complex-sutured goniatites, ceratites, and ammonites were designed for ecologically-zoned lives involving vertical migrations to progressively greater depths.

The aforementioned small, shovel-like jaws of ammonites prompted Lehmann¹⁹⁷ to suggest that they were benthonic. If so, then sutural complication would reflect progressively deeper sea-floor-dwelling habitats. Most, however, regard ammonites as being nektonic: for example, Chamberlain¹⁹⁸ maintains that ". . . nearly all ammonoids required some swimming proficiency." The near-lack of trace-fossils attributable to ammonoids and the rarity of encrusting animals on them argues strongly against their benthonism, whereas the asymmetry of sutures¹⁹⁹ does not compel belief on ontogeny on the sea floor. The gastropod-like helicoidally-coiled ammonoids had been accepted as being benthonic on the basis of comparison with gastropod habitats; but there is no real evidence for any ammonoid-torticone losing buoyancy.²⁰⁰ The openly-coiled heteromorphs need not have been benthonic because of their fragile, non-streamlined shells; a deep-water existence would apparently suffice,²⁰¹ also corroborating deep-water complex-sutured lives.

The precise depth to which ammonites went has not been settled by modern scholarship. Mutvei,²⁰² having supported great vertical migrations, contends on the basis of assumed pre-diagenetic conch thickness that ammonoids may have descended to 1000 meters deep, which is many times deeper than the stratigraphically-lowest forms. While most others disagree with the great

depth figure, it is nevertheless agreed that the simple-sutured ammonites went only 100 meters deep—scarcely more than the earliest forms—whereas the complexly-sutured ammonites went as deep as the extant *Nautilus*,²⁰³ which is over 600 meters. Thus there is further scientific basis for mutual coexistence (Fig. 4).

Although goniatites (PermoCarboniferous), ceratites (Triassic), and ammonites (entire Mesozoic) with their respective sutural complication trends are so distributed (Figs. 2, 4), there is nevertheless total overlap. Members of Clymeniida have simpler sutures than their supposed ancestors and five-lobed forms precede four-lobed groups.²⁰⁴ Furthermore: "... highly complex, typically ammonitic sutures are found in some families of the Early Permian; ceratitic sutures appear in some families of the Early Mississippian; goniatitic sutures occur in some Triassic and Cretaceous ammonites ... and more or less ceratitic sutures reappear in both the Jurassic and Cretaceous in numerous families totally unrelated to the Triassic ceratites."²⁰⁵ This mixing is an indicator of the inevitable overlap of ecological zones and even more inevitable mixture of mutually foreign groups during Flood deposition.

Fig. 4 does not list all cephalopod orders (Fig. 2), but each listed one is also quite representative of adjoining orders. All the ammonoid orders are represented by the above-mentioned three groups. The far-offshore Belemnites are neritic,²⁰⁶ as are the similar Phragmotethids and Aulocerids. The squids (Teuthida) are ten times more efficient as swimmers (far less drag) than the most streamlined coiled-conch forms²⁰⁷ and 100 times more efficient than non-streamlined conches. The Coleoids, as exemplified by squids, were oceanic forms (Fig. 4) created for rapid, rocket-propelled swimming in contrast to the nearshore groups discussed.

Quantitative pressure-tolerance tests, a major area of cephalopod research in this decade, support Fig. 4. "Assuming that actual habitats ranged to approximately $\frac{2}{3}$ of the mechanical limits of the shells, the following maximum depth ranges are indicated by this preliminary survey: Endoceratoidea 100-450 m; Actinoceratoidea 40-150 m; Nautilida, Ellesmerocerida 50-200 m, Orthocerida 150-500 m, Oncocerida < 150 m, Discosorida < 100 m, Tarphycerida < 150 m, Nautilida 200-100 m; Bactritoidea < 400 m; Coleoidea, Aulocerida 200-900 m, Sepiida 200-1000 m, Belemnitida 50-200, exceptionally 350 m.²⁰⁸ "Particularly noteworthy are the facts of wide range for nektonic forms (in contrast to benthonic forms) and the very great depth capabilities of the Coleoids (except the early-appearing (Fig. 2) Belemnites). The quantitative values, however, are approximate: "The wide range for implosion values and lack of strong correlation between such parameters as septal thickness and implosion indicate that determination of depth ranges for fossil cephalopods may be difficult."²⁰⁹ Yet, with the major exception of ammonoids (whose range was septally restricted) and Bactritids (nektobenthonic), nektonic (Fig. 2) orders have far longer stratigraphic ranges than do benthonic or even nektobenthonic orders, suggesting greater ecological independence of free-swimming forms as opposed to the narrowly-restricted benthos.

The observed great extent of mutual overlap, expected in marine ecology, nevertheless is restricted by competition; forms flourishing only in marine regions for which they were designed. In fact, when mutual contemporaneity is accepted, patterns of competitive exclusion become evident. Nautiloids are most prevalent (lower Paleozoic) where no ammonoids were; whereas they are very rare in the Mesozoic (when ammonoids flourished). Specifically, "The Silurian ... was perhaps the heyday of the nautiloids ..."²¹⁰ but "... as compared with other molluscan groups, including ammonoids, 'nautiloid' cephalopods are rare fossils."²¹¹ They are always in minority; outnumbered by other molluscs commonly by 10,000:1 to 1000:1.²¹¹ The gregarious nature of many cephalopods, such as ammonoids,²¹² undoubtedly sharpened many ecological boundaries. The lack of larval stages for most cephalopods, notably the ammonoids²¹³ and belemnoids,²¹⁴ further restricted their migrations. The lack of great temperature differences, absence of storms (Genesis 2:6), etc., all characteristic of the antediluvian earth, contributed to a relative lack of sea turmoil (and oceanic currents), further reducing mixture of ecologically-zoned cephalopods—as did the short duration of time between the Creation and the Noachian Deluge (approximately 1,700 years).

C. The Sequential Flood Burial of Cephalopods

Before a description is given as to how the ecologically-zoned cephalopod orders (Fig. 4) were for that reason stratigraphically (Fig. 2) separated during Flood deposition, other factors are noteworthy—which also explain the intra-ordinal stratigraphic order. Examining the original² of Fig. 2, it is apparent that most families within an order cover more than half of the stratigraphic range of the entire order; hence ecological zonation was the major factor in family-level as well as ordinal-level stratigraphic ordering. Although fossil cephalopod "genera" and "species" are found to be concocted—not real—entities, somewhat consistent intrafamilial stratigraphic trends are observed. Since these trends are physical (size, shape, mass, etc.), they are evidently caused by Floodwater sorting (see Whitcomb and Morris¹⁶⁷).

Intrafamilial conch-size increases are very common²¹⁵ and are regarded as being an example of Cope's Law of evolutionary size increase, but many exceptions are known.²¹⁶ Also "One repeatedly made observation is that the sharp-edged discoidal shell ... associated with a ... calcareous and detrital shelly facies."²¹⁷ These two trends may be caused by the denser (because smaller and/or mass not spread out in unornamented forms, etc.) forms tending to be buried earlier than ornamented and larger forms; the "facies" separation reflecting sequential increasing-maximum sediment carrying capacity of the Floodwater mass movement. Other separations are caused by differential escape from burial. Since "Properly roughened shells may have conserved as much as 50% of the propulsive power required by smooth shells of the same size and shape,"²¹⁸ progressive roughening trends indicate the superior escape-postponement of roughened—as opposed to smooth—forms. The common trend of progressively more ventral siphuncle (greater buoyancy con-

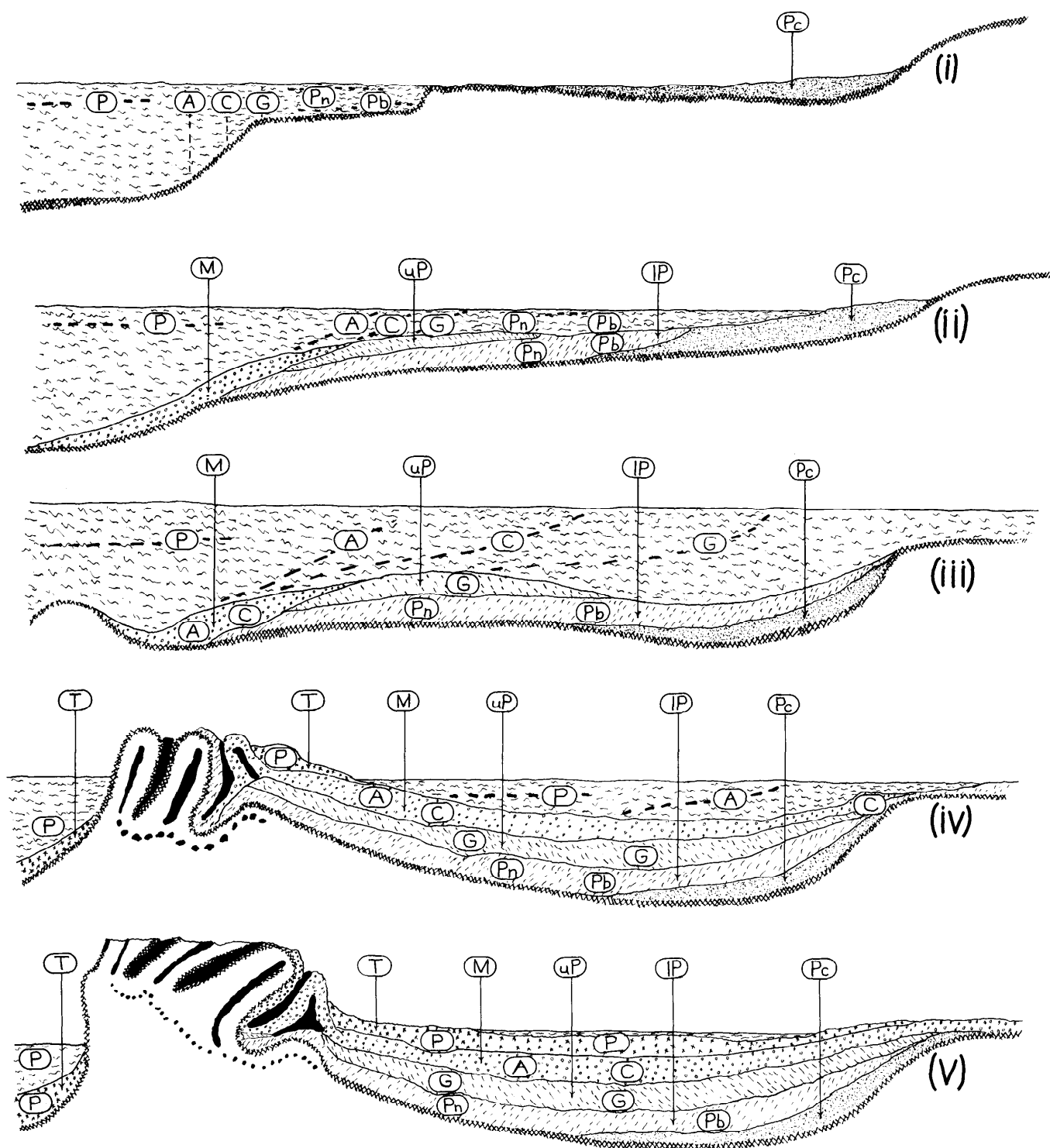


Figure 5. The result of burial in the Flood, according to ecological zonation. The alleged geological ages are indicated as follows: Pc: Precambrian; IP: lower Paleozoic; uP: upper Paleozoic; M: Mesozoic; T: Tertiary. The other symbols, if not obvious, are explained in the text. Note that the left part of (i) is the same situation as that shown in Figure 4.

trol) as exemplified by the *Nicomedites-Gymnotoceras-Frechites* series²¹⁹ also mirrors the superior burial-escape of stratigraphically higher forms.

So numerous, however, are major exceptions to these and other trends that Arkell²¹⁷ contents that "... there are many obstacles to the acceptance of any generalization." These intrafamilial-order exceptions are to be ex-

pected owing to the variability of the physical action of flowing Floodwater. Large-scale sortings are manifest in the Caucasus,²²⁰ whereas in southern Germany "Current orientation of coiled ammonites . . . indicates fairly strong currents."²²¹

Noting that sorting (intrafamilial order) is secondary and ecological zonation (familial and ordinal strati-

graphic order) primary in Floodwater sequential burial, and keeping the zonation (Fig. 4) and result (Fig. 2) in mind, the following (Fig. 5) is the indicated scenario of Flood burial:

The earliest stage (i) sees the falling rains and water from the fractured fountains of the deep eroding into the antediluvian mountains and depositing the sediment as the Late Precambrian; the antediluvian seas not immediately overflowing the continental mass(es). (During the entire time span of the deposition, basins subside as they are being smothered by sediment. The antediluvian highland areas (Fig. 5, far right) provide the majority of the clastic sediment in the early (i, ii) and middle (iii) Flood stages; late-Flood uplifts (iv, v, far left) providing sediment during the recessional phases of the Universal Deluge.

The breaking up of the fountains of the deep and all the associated volcano-tectonic results on the ocean floor cause the oceans to rise sharply, overflowing completely the continent(s). The cephalopod habitats are driven unto land, preserving the ecological zonation (Fig. 4) owing to the great lateral extent (several hundred miles) of the zonation in relation to the water depth (a few thousand feet). The ecological zones, separated laterally, become vertically superposed during Flood entombment of their cephalopod constituents, giving rise to the geologic column (Fig. 2).

Thus, as the oceans begin to inundate vast land areas (ii) in the first few weeks of the Deluge, the most frontal waters carry the most-nearshore orders. Accordingly, it is they (Pb-Paleozoic benthos, Pn-Paleozoic nektobenthos and nektos) which are the first deposited in any area as the ocean water moves ever landward, giving rise to the early Paleozoic rock systems. Other systems are laid down contemporaneously not far behind, each area passed-over by ecological zones.

The Flood reaches its greatest depth (covering everything) towards the end of the 150-day prevailing period. At this time (iii), the lower Paleozoic is nearly all laid down, while much of the Upper Paleozoic (with G-Goniatites) is being laid down, followed vertically by the complex-sutured ceratites (C) and then ammonites (A); the last two of which comprise the Mesozoic systems.

The earlier-deposited Paleozoic systems become intensely folded (iv) in the orogenies which mark the Flood—recessional half—year. The recession sees completion of deposition of Upper Paleozoic, most of the Mesozoic, and part of the Tertiary, which contains the pelagos (P), or far off-shore forms which are the sole survivors of the class.

Diluviological research strongly indicates that most (but not all) of the Tertiary is post-Flood. Hence (v) much of the Tertiary is the result of huge inland waterways which persisted perhaps decades after the Flood year. The continental-shelf Tertiary (v, lower left), on the other hand, represents the fixing of the shoreline between ocean and land at the very end of the Flood.

The extinction of cephalopods at various stratigraphic intervals is enigmatic to the evolutionist—uniformitarians, especially the disappearance of the ammonoids at the end of the Cretaceous. The Paleozoic forms and all ammonoids became extinct because they were all driven on the land; the presently-living forms being

spared extinction because they are deep-water oceanic forms which were not all forced on land during the Flood. The narrow ecological tolerance of the near-shore forms also contributed to extinction; any sparse ammonoid survivors being incapable of holding their own against the overwhelming populations of deep water forms which had soon begun explosively to proliferate in the Flood-shattered marine ecosystem.

The Flood deposition portrayed by cross-sections in Fig. 5 does not indicate the many exceptions of cephalopod-carrying Floodwaters. Varying local zonations caused observed missing “ages”, whereas localized inversions of flow gave rise to “reverse-age” sequences. Interplay with similarly-zoned land fossils and other marine fossils are reflected by the endless variations in stratigraphy. A bed of only ammonites and marine fossils is called “marine Jurassic” whereas the same fossils interspersed with dinosaur bones is called a “continental Jurassic.”

In conclusion, this paramount marine-invertebrate class provides an amazing amount of evidences for and ramifications of the Creationist-Diluvialist paradigm. The unifying factor is the way God used combinations of morphological attributes in any given form and placed these forms in different ecological positions.

References

- AG—American Association of Petroleum Geologists Bulletin
 - AJ—American Journal of Science
 - BP—Bulletins of American Paleontology
 - BR—Biological Reviews
 - CE—Canadian Journal of the Earth Sciences
 - DE—Doklady: Earth Science Sections (translated from Russian)
 - EV—Evolution
 - GA—Geological Society of American Abstracts with Programs
 - GM—Geological Magazine
 - JG—Journal of Geology
 - JP—Journal of Paleontology
 - LE—Lethaia
 - NA—Nature
 - NP—Neues Jahrbuch Fur Geologie und Palaontologie (M—Monatshefte; A—Abhandlungen)
 - PA—Palaeontology
 - PB—Paleobiology
 - PJ—Paleontological Journal (translation from Russian)
 - PZ—Palaeontologisch Zeitschrift
 - TP—Treatise on Invertebrate Paleontology
 - UP—University of Kansas Paleontological Contributions Paper
- ¹Sweet, W. C. 1964. Cephalopoda—General Features. TP K7.
 - ²Teichert, C. 1967. Major Features of Cephalopod Evolution. *University of Kansas Special Publication* 2, pp. 198-201.
 - ³Fischer, A. G. 1965. Fossils, Early Life, and atmospheric history. *Proceedings National Academy of Science USA* 53:1209.
 - ⁴Yochelson, E. L., Flower, R. H., and G. F. Webers. 1973. The bearing of the new Late Cambrian monoplacophoran *Knightsconus* upon the origin of the Cephalopods. LE 6(3):276.
 - ⁵Kuhn, T. S. 1970. *The Structure of Scientific Revolutions*. University of Chicago Press, p. 70-1.
 - ⁶Valentine, J. W. and C. A. Campbell. 1975. Genetic Regulation and the Fossil Record. *American Scientist* 63(6):678.
 - ⁷Ibid., p. 674.
 - ⁸Barnes, R. D. 1974. *Invertebrate Zoology*. Saunders & Co., p. 431.
 - ⁹Stasek, C. R. 1972. The Molluscan Framework. *Chemical Zoology* 3(12):38-40.
 - ¹⁰Yonge, C. M. 1977. (Review) NA 267(5609):379.
 - ¹¹Teichert. 1967. *op. cit.*, p. 163.
 - ¹²Vologdin, A. G. 1969. A New Find of Cephalopods in the Middle Cambrian of Czechoslovakia. DE 186:258.
 - ¹³Sweet, W. C., Teichert, C., and B. Kummel. 1964. Phylogeny and Evolution. TP K106.

- ¹⁴Ulrich, E. O. and A. F. Foerste. 1933. The Earliest Known Cephalopods. *Science* 78:288.
- ¹⁵Lipps, J. H. and A. G. Sylaster. 1968. the Enigmatic Cambrian Fossil *Volborthella* and Its Occurrence in California. *JP* 42(2):329.
- ¹⁶Yochelson, E. H., Flower, R. H., and G. F. Webers. 1972. A Theory of Origin of the Cephalopods. *GA* 4(7):712.
- ¹⁷Gish, D. T. 1973. *Evolution: The Fossils Say No!* Creation-Life, San Diego. P. 45-70.
- ¹⁸Sokolov, B. S. 1975. The Current Problems of Paleontology and Some Aspects of Its Future. *PJ* 9(2):137.
- ¹⁹Teichert, C. and R. C. Moore. 1964. Classification and Stratigraphic Distribution. *TP* K99.
- ²⁰Flower, R. H. 1961. Major divisions of the Cephalopoda. *JP* 35(3):571.
- ²¹Teichert. 1967. *op. cit.*, pp. 182-3.
- ²²Donovan, D. T. 1964. Cephalopod Phylogeny and Classification. *BR* 39(3):266.
- ²³Jeletzky, J. A. 1966. Comparative Morphology, Phylogeny, and Classification of Fossil Coleoidea. *UP Article 7: Mollusca* p. 20.
- ²⁴Arkell, W. J. 1957. Introduction to Mesozoic Ammonoidea. *TP* L103.
- ²⁵George, T. N. 1971. Systematics in Paleontology. *Quarterly Journal of the Geological Society of London* 127(3):231-2.
- ²⁶Boucot, A. J. 1975. *Evolution and Extinction Rate Controls* Elsevier, p. 196.
- ²⁷Gould, S. J. and N. Eldredge. 1977. Punctuated Equilibria: the tempo and mode of evolution reconsidered. *PB* 3(2):116.
- ²⁸Gould, S. J. 1971. Speciation and Punctuated Equilibria: An Alternative to Phyletic Gradualism. *GA* 3(7):585.
- ²⁹Harper, C. W. 1976. Phylogenetic Inference in Paleontology. *JP* 50(1):190.
- ³⁰Jeletzky, J. A. 1955. Evolution of Santonian and Campanian *Belemnitella* and Paleontological Systematics exemplified by *Belemnitella praecursor* Stolley. *JP* 29(2):489.
- ³¹Boucot. 1975. *op. cit.*, p. 197.
- ³²Bretzky, S. S. 1977. Recognition of Ancestor-Descendant Relationships in Invertebrate Paleontology. *JP* 51(2) supplement (pt. III of III) p. 4.
- ³³Murphy, M. A. 1977. On Time-Stratigraphic Units. *JP* 51(2):214.
- ³⁴Arkell. 1975. *op. cit.*, p. L113.
- ³⁵Gould, S. J., Raup, D. M., Sepkoski, J., T. J. M. Schopf, and D. S. Simberloff. 1977. The shape of evolution: a comparison of real and random clades. *PB* 3(1):34-5.
- ³⁶Jeletzky. 1955. *op. cit.*, p. 490.
- ³⁷Teichert. 1967. *op. cit.*, p. 194.
- ³⁸Reyment, R. A. 1974. Analysis of a Generic-Level Transition in Cretaceous Ammonites. *EV* 28(4):675.
- ³⁹Boucot, A. J. 1975b. Standing Diversity of Fossil Groups in Successive Intervals of Geologic Time Viewed in the light of changing levels of Provincialism. *JP* 49(6):1110.
- ⁴⁰Donovan, D. T. 1959. Septa and Sutures in Jurassic Ammonites. *GM* XCIV(2):168.
- ⁴¹Wiedman, J. 1969. The Heteromorphs and Ammonoid Extinction. *BR* 44(4):588, 590-1.
- ⁴²Haas, O. 1971. Recent Literature on Mesozoic Ammonites—Part XII. *JP* 45(3):546.
- ⁴³Newell, N. D. 1949. Phyletic Size Increase—An Important Trend Illustrated by Fossil Invertebrates. *EV* 3(2):115.
- ⁴⁴Clark, D. L. 1962. Pedomorphosis, Acceleration, and Caenogenesis in the Evolution of Texas Cretaceous Ammonoids. *EV* 16:300.
- ⁴⁵*Ibid.*, p. 302.
- ⁴⁶*Ibid.*, p. 303.
- ⁴⁷Donovan, D. T. 1973. The Influence of Theoretical Ideas on Ammonite Classification from Hyatt to Trueman. *UP* 62, p. 15.
- ⁴⁸Arkell. 1957. *op. cit.*, p. L110.
- ⁴⁹Donovan. 1973. *op. cit.*, p. 13.
- ⁵⁰*Ibid.*, p. 1.
- ⁵¹Cowen, R., Gertman, R. and G. Wigget. 1973. Camouflage Patterns in *Nautilus* and Their Implications for Cephalopod Paleobiology. *LE* 6(2):211-2.
- ⁵²Arkell. 1957. *op. cit.*, p. L112.
- ⁵³Haas, O. 1942. Recurrence of Morphological Types and Evolutionary Cycles in Mesozoic Ammonites. *JP* 16(5):643.
- ⁵⁴Haas, O. 1969. Recent Literature on Mesozoic Ammonites—Part X. *JP* 43(3):787.
- ⁵⁵Tozer, T. E. 1971. One, Two, or Three Connecting Links Between Triassic and Jurassic Ammonoids? *NA* 232(5312):565.
- ⁵⁶Haas, O. 1974. Recent Literature on Mesozoic Ammonites—Part XVI. *JP* 48(5):1005.
- ⁵⁷Arkell, W. J. 1957b. Sutures and Septa in Jurassic Ammonite Systematics. *GM* XCIV(3):235.
- ⁵⁸Ward, P. D. W. and V. S. Mallory. 1977. Taxonomy and Evolution of the Lytoceratid Genus *Pseudoxybeloceras* and Relationship to the Genus *Solenoceras*. *JP* 51(3):606.
- ⁵⁹Flower, R. H. and C. Teichert. 1957. The Cephalopod Order Discosorida. *UP* 21, p. 6.
- ⁶⁰Teichert, C. and R. E. Crick. 1974. Endosiphuncular Structures in Ordovician and Silurian Cephalopods. *UP* 71, p. 11-12.
- ⁶¹Teichert, C. 1964. Morphology of Hard Parts. *TP* K50.
- ⁶²Druschits, V. V. and I. A. Mikhailova. 1974. On the Systematics of Early Cretaceous Ammonites. *PJ* 8(4):477.
- ⁶³*Ibid.*, p. 470.
- ⁶⁴Jeletzky. 1966. *op. cit.*, p. 10.
- ⁶⁵Cloud, P. E. 1948. Some problems and Patterns of Evolution Exemplified by Fossil Invertebrates. *EV* 2:329.
- ⁶⁶Ward, P. D. 1976. Upper Cretaceous Ammonites (Santonian-Campanian) From Orcas Island, Washington. *JP* 50(3):459.
- ⁶⁷Packard, A. 1972. Cephalopods and Fish: The Limits of Convergence. *BR* 47:269.
- ⁶⁸*Ibid.*, p. 267.
- ⁶⁹*Ibid.*, p. 263.
- ⁷⁰*Ibid.*, p. 286.
- ⁷¹*Ibid.*, p. 285.
- ⁷²Flower, R. H. and B. Kummel. 1950. A Classification of the Nautiloidea. *JP* 24(5):604-5.
- ⁷³Arkell. 1957b. *op. cit.*, p. 246.
- ⁷⁴Tatarinov, L. P. 1976. Current Problems in Evolutionary Paleontology. *PJ* 10(2):123.
- ⁷⁵Raup, D. M. 1967. Geometric Analysis of Shell Coiling: Coiling in Ammonoids. *JP* 41(1):54.
- ⁷⁶Valentine, J. W. and E. M. Morris. 1972. Global Tectonics and the Fossil Record. *JG* 80:178.
- ⁷⁷Runnegar, B. and K. W. S. Campbell. 1976. Late Paleozoic Faunas of Australia. *Earth Science Reviews* 12:247.
- ⁷⁸Harland, W. B. 1977. Essay Review: *International Stratigraphic Guide*, 1976. *GM* 114(3):233.
- ⁷⁹Valentine, J. W. 1969. Patterns of Taxonomic and Ecological Structure of the Shelf Benthos during Phanerozoic Time. *PA* 12(4):688.
- ⁸⁰Shaw, A. B. 1969. Adam and Eve, Paleontology and the Non-Objective Arts. *JP* 43(5):1085.
- ⁸¹*Ibid.*, p. 1094.
- ⁸²*Ibid.*, p. 1096.
- ⁸³Mapes, R. H. 1976. An Unusually Large Pennsylvanian Ammonoid from Oklahoma. *Oklahoma Geology Notes* 36:47.
- ⁸⁴Hallam, A. 1965. Observations on Marine Lower Jurassic Stratigraphy with Special Reference to the United States. *AG* 49(9):1495.
- ⁸⁵Torrens, H. S. 1969. The Stratigraphical Distribution of Bathonian Ammonites in Central England. *GM* 106(1):67-8.
- ⁸⁶Hall, R. L. 1975. Sexual Dimorphism in Middle Bajocian (Jurassic) Ammonite Faunas of British Columbia. *GA* 7(6):722.
- ⁸⁷Davis, R. A. 1971. Mature Modification and Dimorphism in Selected Late Paleozoic Ammonoids. *BP* 62(272):38.
- ⁸⁸Haas. 1971. *op. cit.*, p. 550.
- ⁸⁹Wiedman, J. 1973. Evolution or Revolution of Ammonoids at Mesozoic System Boundaries. *BR* 48(2):160.
- ⁹⁰Donovan, D. T. and G. F. Forsey. 1973. Systematics of Lower Liassic Ammonoidea. *UP* 64, p. 2.
- ⁹¹Donovan. 1964. *op. cit.*, p. 270.
- ⁹²Donovan. 1973. *op. cit.*, p. 7.
- ⁹³Haas. 1969. *op. cit.*, p. 786.
- ⁹⁴Friebold, H. 1967. Position of the Lower Jurassic Genus *Fanninoceras* McLearn and the Age of the Maude Formation on Queen Charlotte Islands. *CE* 4:1145.
- ⁹⁵Hess, P. C. 1972. Essay Review. *AJ* 272(2):193.
- ⁹⁶Teichert. 1967. *op. cit.*, p. 180.
- ⁹⁷Haas, O. 1968. Recent Literature on Mesozoic Ammonites—Part IX. *JP* 42(3):763.
- ⁹⁸Flower, R. H. 1955. Trails and Tentacular Impressions of Orthoconic Cephalopods. *JP* 29(5):857.
- ⁹⁹Haas. 1974. *op. cit.*, p. 1002.
- ¹⁰⁰Haas, O. 1973. Recent Literature on Mesozoic Ammonites—Part XIV. *JP* 47(3):539.
- ¹⁰¹Runnegar, B. 1969. A Lower Triassic Ammonoid Fauna from Southeast Queensland. *JP* 43(3):820.

- ¹⁰²Flower, R. H. 1968. Cephalopods from the Tinu Formation, Oaxaca State, Mexico. *JP* 42(3):804.
- ¹⁰³Tozer, E. T. 1969. Xenodiscacean Ammonoids and their Bearing on the Discrimination of the Permo-Triassic Boundary. *GM* 106(4):350.
- ¹⁰⁴Flower, R. H. and R. Gordon. 1959. More Mississippian Belemnites. *JP* 33(5):809.
- ¹⁰⁵Donovan. 1959. *op. cit.*, p. 169.
- ¹⁰⁶Arkell. 1957. *op. cit.*, p. L103.
- ¹⁰⁷Arkell, W. C. 1956. *Jurassic Geology of the World*. Oliver and Boyd, London, p. 6.
- ¹⁰⁸Haas. 1974. *op. cit.*, p. 1003.
- ¹⁰⁹Hallam. 1965. *op. cit.*, p. 1798.
- ¹¹⁰Hedberg, H. H. 1965. Chronostratigraphy and Biostratigraphy. *GM* 102(5):451.
- ¹¹¹Schindewolf, O. H. 1957. Comments on Some Stratigraphic Terms. *AJ* 255:397-8.
- ¹¹²Arkell. 1956. *op. cit.*, p. 12.
- ¹¹³Young, K. 1961. Upper Cretaceous Ammonites from the Gulf Coast of the United States. *GA*-1961, p. 181A.
- ¹¹⁴Corban, et. al. 1958. *Scaphites depressus* Zone (Cretaceous) in Northwestern Montana. *AG* 42(3):658.
- ¹¹⁵Hedberg, H. D. 1959. Towards Harmony in Stratigraphic Classification. *AJ* 257:677.
- ¹¹⁶Wheeler, H. E. 1958. Primary Factors in Biostratigraphy. *AG* 42(3):651.
- ¹¹⁷Haas, O. 1972. Recent Literature on Mesozoic Ammonites—Part XIII. *JP* 46(5):755.
- ¹¹⁸von Hillebrandt, A. 1970. Zur Biostratigraphie und Ammoniten-Fauna des sudamerikanischen Jura (isbes Chile). *NP A* 36(2):167.
- ¹¹⁹Tozer. 1969. *op. cit.*, p. 349.
- ¹²⁰Hallam. 1965. *op. cit.*, p. 1490.
- ¹²¹Haas, O. 1976. Recent Literature on Mesozoic Ammonites—Part XVII. *JP* 50(5):952.
- ¹²²*Ibid.*, p. 944.
- ¹²³Goebel, E. D. 1969. Late Devonian Age of a Mixed Conodont fauna from a core in Southwestern Kansas. *GA* 1(6):18.
- ¹²⁴Grant, R. E. 1970. Brachiopods from Permian-Triassic Boundary Beds and Age of Chhidru Formation, West Pakistan. *University of Kansas Special Publication* 4, p. 126.
- ¹²⁵Ruzhentsev, V. Ye. 1975. Carboniferous ammonoids and chronostratigraphy of Eastern Siberia. *PJ* 9(2):157.
- ¹²⁶Van Hinte, J. E. 1976. A Jurassic Time Scale. *AG* 60(4):489.
- ¹²⁷Van Hinte, J. E. 1976. A Cretaceous Time Scale. *AG* 60(4):499.
- ¹²⁸Boucot. 1975b. p. 1108.
- ¹²⁹Ager, D. 1973. *The Nature of the Stratigraphic Record*. John Wiley and Sons, New York, p. 17.
- ¹³⁰Haas, O. 1973. Recent Literature on Mesozoic Ammonites—Part XV. *JP* 47(5):899.
- ¹³¹Jeletzky, J. A. 1950. Some Nomenclatorial and Taxonomic Problems in Paleozoology. *JP* 24(1):24.
- ¹³²Gould et. al. 1977. *op. cit.*, p. 29.
- ¹³³Campbell, C. A. and J. W. Valentine. 1977. Comparability of modern and ancient marine faunal provinces. *PB* 3(1):55.
- ¹³⁴Furnish, W. M. and B. F. Glenister. 1970. Permian Ammonoid *Cyclolobus* from the Salt Range, West Pakistan. *University of Kansas Special Publication* 4, p. 185.
- ¹³⁵Silberling, N. J. 1959. Pre-Tertiary Stratigraphy and Upper Triassic Paleontology of the Union District, Shoshone Mountains, Nevada. *United States Geological Survey Professional Paper* 322, p. 42.
- ¹³⁶Corban, et. al. 1958. *op. cit.*, p. 657.
- ¹³⁷Murphy. 1977. *op. cit.*, p. 218.
- ¹³⁸Kranz, P. M. 1974. The Anastrophic Burial of Bivalves and Its Paleocological Significance. *JG* 82:237.
- ¹³⁹Haas. 1972. *op. cit.*, p. 752.
- ¹⁴⁰Seilacher, A., Andalib, F., Dietl, G., and G. Gocht. 1976. Preservation history of compressed Jurassic ammonites from Southern Germany. *NP M* 152(3):314.
- ¹⁴¹*Ibid.*, p. 317.
- ¹⁴²Haas. 1972. *op. cit.*, p. 747.
- ¹⁴³*Ibid.*, p. 757.
- ¹⁴⁴Rayner, D. H. 1967. *The Stratigraphy of the British Isles*. Cambridge University Press, p. 290.
- ¹⁴⁵*Ibid.*, p. 285.
- ¹⁴⁶Tozer, E. T. 1971. Triassic Time and Ammonoids: Problems and Proposals. *CE* 8:995.
- ¹⁴⁷Heim, A. 1958. Oceanic Sedimentation and Discontinuities. *Eclogae Geologicae Helvetiae* 51(3):644.
- ¹⁴⁸Ager. 1973. *op. cit.*, p. 40.
- ¹⁴⁹Wendt, J. 1970. Stratigraphische Kondensation in tradischen und jurassischen Cephalopodenkalken der Tethys. *NP M* 1970. Heft 7, p. 433.
- ¹⁵⁰Tozer. 1971. *op. cit.*, p. 996.
- ¹⁵¹Jenkyns, H. C. 1971. The Genesis of Condensed Sequences in the Tethyan Jurassic. *LE* 4(3):333.
- ¹⁵²*Ibid.*, p. 347.
- ¹⁵³*Ibid.*, p. 337.
- ¹⁵⁴*Ibid.*, p. 330.
- ¹⁵⁵Tozer. 1971. *op. cit.*, p. 1008.
- ¹⁵⁶Arkell. 1959. *op. cit.*, p. 480-1.
- ¹⁵⁷Hallam, A. 1972. Diversity and Density Characteristics of Pliensbachian-Toarchian molluscan and brachiopod faunas of the North Atlantic Margins. *LE* 5(4):391.
- ¹⁵⁸Jenkyns. 1971. *op. cit.*, p. 335.
- ¹⁵⁹Ziegler, B. 1959. Evolution in Upper Jurassic Ammonites. *EV* 13:233.
- ¹⁶⁰Fursich, F. T. 1973. *Thalassinoides* and the origin of nodular limestone in the Corallian Beds (Upper Jurassic) of Southern England. *NP M* 1973. Heft 3, p. 151.
- ¹⁶¹Jenkyns. 1971. *op. cit.*, p. 343.
- ¹⁶²Tozer. 1971. *op. cit.*, p. 992.
- ¹⁶³Haas. 1973. *op. cit.*, p. 535.
- ¹⁶⁴Waterhouse, J. B. 1973. An Ophiceratid Ammonoid from the New Zealand Permian and its implications for the Permian-Triassic Boundary. *GM* 110(4):305.
- ¹⁶⁵Wiedenmeyer, F. 1966. Problems in Biostratigraphy and taxonomy of Middle Liassic of Alpine Mediterranean Province. *AG* 50(3):641.
- ¹⁶⁶Whitcomb, J. C. and H. M. Morris. 1961. *The Genesis Flood*. Baker, p. 273.
- ¹⁶⁷Clark, H. W. 1968. *Fossils, Flood, and Fire*. Outdoor Pictures, California, p. 51-60.
- ¹⁶⁸Krassilov, V. 1974. Causal Biostratigraphy. *LE* 7(3):174.
- ¹⁶⁹Bell, W. C. 1950. Stratigraphy: A Factor In Paleontologic Taxonomy. *JP* 24(4):493.
- ¹⁷⁰*Ibid.*, p. 496.
- ¹⁷¹Thayer, C. W. 1973. "Evolution" of Upper Devonian Marine Communities Controlled by Rate of Progradation. *GA* 5(3):227.
- ¹⁷²*Ibid.*, p. 441.
- ¹⁷³*Ibid.*, p. 440.
- ¹⁷⁴Bambach, R. K. 1977. Species richness in marine benthic habitats through the Phanerozoic. *PB* 3:153.
- ¹⁷⁵Teichert, C. and B. F. Glenister. 1954. Early Ordovician Cephalopod Fauna from Northwestern Australia. *BP* 35(150):7.
- ¹⁷⁶Cox, C. B. et. al. 1976. *Biogeography: An Ecological and Evolutionary Approach*. Blackwell Scientific Publications, London, 2nd Edition, p. 48-50.
- ¹⁷⁷Chamberlain, J. A. 1973. Phyletic Improvements in Hydromechanical Design and Swimming Ability in Fossil Nautiloids. *GA* 5(7):571.
- ¹⁷⁸Packard. 1972. *op. cit.*, p. 291.
- ¹⁷⁹Cowen, R. 1973. Explosive Radiations and Early Cephalopods. *GA* 5(7):585.
- ¹⁸⁰Furnish, W. M. and B. F. Glenister. 1964. Paleocology. *TP K*120-3.
- ¹⁸¹Donovan. 1964. *op. cit.*, p. 264.
- ¹⁸²Cowen, R. 1975. Buoyancy Control in Ellesmerocerid Nautiloids. *GA* 7(7):1041.
- ¹⁸³Valentine, F. G. and R. M. Finks. 1974. The Functional Significance of the Ammonoid Suture Pattern and the Origin of the Ammonoids. *GA* 6(7):994.
- ¹⁸⁴Hallam. 1972. *op. cit.*, p. 391.
- ¹⁸⁵Teichert. 1967. *op. cit.*, p. 185.
- ¹⁸⁶Arkhipov, Y. V. and I. S. Barskov. 1970. Nautilids with an Intriguingly Dissected suture line. *DE* 195:218.
- ¹⁸⁷Raup, D. M. and S. M. Stanley. 1971. *Principles of Paleontology*. W. H. Freeman and Co., San Francisco, p. 181.
- ¹⁸⁸Wiedman. 1973. *op. cit.*, p. 173.
- ¹⁸⁹Miller, A. K., Furnish, W. M., and O. H. Schindewolf. 1957. Paleozoic ammonioidea. *TP* L18.
- ¹⁹⁰Arkell. 1975. *op. cit.*, p. L121.
- ¹⁹¹Packard. 1972. *op. cit.*, p. 259.
- ¹⁹²Heptonstall, W. B. 1970. Buoyancy Control in Ammonoids. *LE* 3(4):321.
- ¹⁹³Mutvei, H. and R. A. Reymont. 1973. Buoyancy Control and Siphuncle Function in Ammonoids. *PA* 16(3):635.
- ¹⁹⁴*Ibid.*, p. 623.
- ¹⁹⁵Lehmann, U. 1975. Über Nahrung und Ernährungsweise von Ammoniten. *PZ* 49(3):187.

- ¹⁹⁸Chamberlain, J. A. 1971. Shell Morphology and the Dynamics of Streamlining in Ectocochliate Cephalopods. *GA* 3(7):524.
- ¹⁹⁹Lominadze, T. A. 1966. Assymetry of the Suture Line in Late Jurassic Ammonites. *DE* 171:241.
- ²⁰⁰Ward, 1976. *op. cit.*, p. 459.
- ²⁰¹Vermeij, G. J. 1977. The Mesozoic marine revolution: evidence from snails, predators, and grazers. *PB* 3(3):247.
- ²⁰²Mutvei, H. 1975. The mode of life in ammonoids. *PZ* 49(3):197.
- ²⁰³Packard, 1972. *op. cit.*, p. 292.
- ²⁰⁴Kullmann, S. and J. Wiedmann. 1970. Significance of Sutures in Phylogeny of Ammonoidea. *UP* 47, p. 2.
- ²⁰⁵Arkell, 1957. *op. cit.*, p. L97.
- ²⁰⁶Christensen, W. K. 1976. Paleobiogeography of Late Cretaceous belemnites of Europe. *PZ* 50(3):114.
- ²⁰⁷Chamberlain, J. A. 1976. Flow Patterns and Drag Coefficients of Cephalopod Shells *PA* 19(3):560.
- ²⁰⁸Westermann, G. E. G. 1973. Strength of Concave Septa and depth limits of fossil Cephalopods. *LE* 6(4):383.
- ²⁰⁹Saunders, W. B. and D. A. Wehmann. 1977. Shell Strength of *Nautilus* as a depth limiting factor. *PB* 3(1):83.
- ²¹⁰Miller, A. K. 1949. The Last Surge of the Nautiloid Cephalopods. *EV* 3:231.
- ²¹¹Teicher, C. and R. C. Moore. 1964. Introduction. *TP* K2
- ²¹²Scott, G. 1940. Paleocological Factors Controlling the Distribution and mode of life of Cretaceous Ammonoids in the Texas area. *JP* 14(4):308.
- ²¹³Haas. 1973. *op. cit.*, p. 543.
- ²¹⁴Barskov, I. S. 1974. Structure of the Protoconch and Ontogeny of the Belemnites (Coleoidea, Cephalopoda). *DE* 208(1-6):218.
- ²¹⁵Hallam, A. 1975. Evolutionary Size increase and longevity in Jurassic bivalves and ammonites. *NA* 258(5534):493.
- ²¹⁶Wiedman. 1969. *op. cit.*, p. 1002.
- ²¹⁷Arkell. 1957. *op. cit.*, p. L119.
- ²¹⁸Chamberlain, J. A. and G. E. G. Westermann. 1976. Hydrodynamic Properties of Cephalopod Shell Ornament. *PB* 2:330.
- ²¹⁹Tozer. 1971. *op. cit.*, p. 1002.
- ²²⁰Sakharov, A. S. and T. A. Lominadze. 1971. Ecological Interrelationships of Middle Callovian Ammonites from the Northeastern Caucasus. *DE* 196:227.
- ²²¹Brenner, K. 1976. Ammoniten-Gehäuse als anzeiger von PaleoStromungen. *NP* A 151(1):101.

A SOLUTION TO SEEING STARS

DAVID M. HARRIS*

Received April 24, 1978, revised from February 14, 1978.

The question is sometimes raised: how distant stars, created only a few thousand years ago, could be visible even now, let alone at the Creation. Here a solution to the problem is proposed. The solution also offers an explanation of the red-shift of the light from stars, without any need of assuming that the universe is expanding.

Introduction

I was very interested to read the article by Lewis Neilson¹ on Certainties, Less Than Certainties, and Evolution. I was struck by the one problem that arose in the article, and would like to introduce a theory that would attempt to answer Mr. Neilson and many other Creation Scientists. This theory is completely speculative, with no experimental evidence to back it up as yet; but it does answer certain points that are difficult to explain in a young universe. This is not a fully developed theory; and I would welcome any contributions of further development that other members, perhaps more qualified than myself, could make. The question is how can we see stars that are apparently billions of light years away, if the universe is only thousands of years old? The answer proposed not only deals with that question, but also proposes a reason, not requiring expansion of the universe, for the red-shift observed in starlight.

The Problem

While I was pondering the difficulty of reconciling the fact that we can see stars that are apparently billions of light years away, with the fact that the universe is probably only thousands of years old, I suddenly remembered what a colleague from my university suggested to me last year: "What if the speed of light were only nearly always constant?" Suddenly a theory formed in front of me, and I would like to present this to the members of the Society.

Since God created the stars on the fourth day, and apparently they were visible on the sixth day to Adam and Eve on the Earth, if the stars were indeed billions of light years away, we have the problem of how this would be possible at a finite speed of light. As rightly noted by Mr. Neilson, some Creationists propose the theory that a continuous span of light was also created by God from the star to the Earth. However, assuming the stars were billions of light years away, there is another possible answer.

A New Model

When Sir Isaac Newton put forward the laws of motion, they were true, up to a point, that of relativistic laws proposed by Einstein. It is quite possible that Einstein's postulation of the constancy of the speed of light is also only true up to a point. Suppose that it were not constant over all time or space, we could build another model of the universe on this.

Suppose that at the time of creation the speed of light were in fact infinite, then the stars would be seen immediately they were created. However, we do know that in this portion of the universe, at this time, the speed of light is not infinite, so somewhere there must have been a change. It is reasonable to assume that this change came in with the fall of man, as did many other changes such as decay and death, or as many creationists believe, the second law of thermodynamics. (See Genesis 2:17-19, Romans 5:12).

Obviously if this meant that everywhere the speed of light became a constant, that of 300,000 kilometers per second, *c*, we would have exactly the same problem as before. In fact the position would have been even worse

*David M. Harris, B.Sc., lives at Unit 85, Frimette Court, 740 Kennedy Road, Scarborough, Ontario, Canada.

for Adam and Eve since all the stars would disappear for at least four years (the nearest star being four light years away). Worse even than that, the whole Earth would be in total darkness for 8 minutes, until light from the Sun could again reach the Earth, or be reflected from the Moon.

However, suppose we assume that at the fall a boundary, spherical in shape (though the shape is not important) moved out from the Earth at a set speed. This could almost be the reaction of the universe to sin entering into it, recoiling in shock, much as ripples on a water surface would react to a pebble dropped into it. Inside this boundary the maximum speed of anything, in particular electro-magnetic radiation, was c . However, outside the boundary the speed of light was still infinite. As will be mentioned later in this article, it would be a better model if we assume something like diffusion, i.e., that the speed of light increased at a certain rate out from the boundary, and did not become infinite until an infinite distance had been reached (i.e., it tended to infinity). Or at least it did not become infinite until a sufficient enough distance to make it not noticeable from our vantage point on the universe. For simplicity, however, we will for the moment take the model that outside the boundary the speed of light was infinite. For this model we will say that the boundary was expanding at a velocity v , this being some velocity less than that of the speed of light inside the system.

Observations from the Earth

Under this system the change in the appearance of the heavens to Adam or Eve would be a dimmer, redder Sun for a short time and stars red shifted at night. Since the boundary is receding from the Earth at velocity v , and the instant the light leaves the Sun it arrives at the boundary, this can be considered as if the Sun's light were emitted from the boundary. If the emission frequency of the Sun's light is f , and the frequency received at the Earth is f' , the Doppler effect gives a change of $f' = fc/(c + v)$, which is a reduction of frequency, or a red shift.² The brightness, or power emitted per unit of time, would be similarly reduced. Also, instead of seeing the heavenly bodies as they were at the time of observation, they would start to see them as they were some time prior to observation time. The time taken for the light from fairly distant objects to reach the Earth would be independent of the distance from the Earth, to begin with. (Reflecting bodies would act a little differently, as I will discuss in a moment.) The length of time for the light to reach the Earth will purely be a function of the position of the boundary from the Earth (i.e., its radius), for all light emitters outside the boundary. In Figure 1 it is obvious that since the speed of light between the star and point B is infinite, the moment the light is emitted by the star, it will arrive at the boundary. If r is the radius of the boundary in units of light years, it will then take r years for the light to reach the Earth from this point, i.e., point B to the Earth E. Since during this time that the light was travelling to the Earth at speed c , the boundary was travelling in the opposite direction at speed v , at any point in time when the boundary was of radius r , observers on Earth would see the light emitted from objects outside the boundary

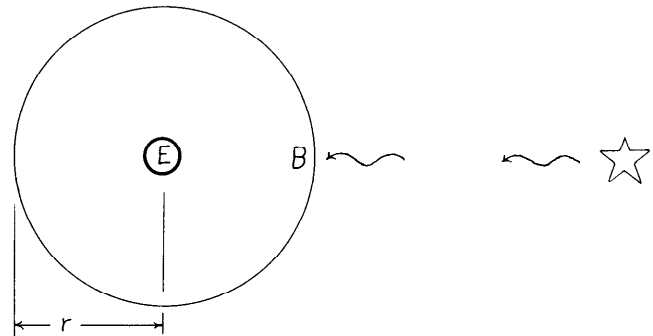


Figure 1. E is the Earth, and B the boundary. The time for the light to go a distance r light years (where its speed is not infinite) is r years; that applies inside the boundary. But at infinite speed, light from the star arrives at the boundary B instantaneously. Thus the total time taken, from the star to the Earth, is r years. These drawings, of course, are not to scale.

$r/(c + v)$ years ago. See Figure 2. If we assume that the fall was, say, 6,000 years ago, then at the present r would be equal to 3,000 light years, for $v = c/2$. Any star farther away than 2,000 light years would be seen as it was 2,000 years ago, regardless of its distance.

Other Observations

The only slight change in the appearance of the heavens, other than that of the Sun, which could have been noticed from the Earth would have been that of bodies reflecting light, for instance planets, which were farther from the Earth than the Sun was at the time of the fall. While the Sun was outside the boundary such reflecting bodies would still be seen, but reduced in brightness, and redder. See Figure 3. Consider Jupiter, for instance. The sunlight would travel to Jupiter and back to the boundary instantaneously, then to Earth in the few minutes that light would take to traverse the distance from the boundary to the Earth at speed c . Since the boundary is receding from the Earth at velocity v , and the instant the light is reflected from Jupiter it arrives at the boundary, it can be seen that this is the same as the situation for the sun as described above, and the frequency received at the Earth f' , is $f' = fc/(c + v)$.

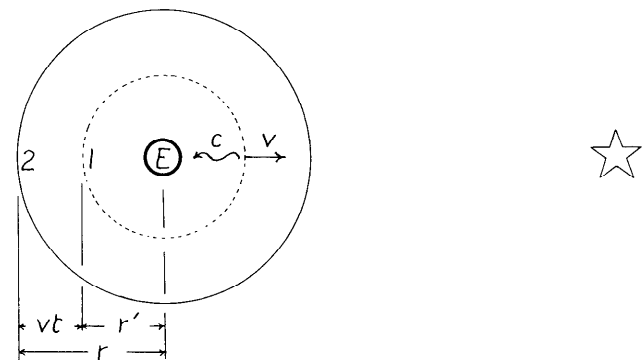


Figure 2. Suppose that the boundary was at the place shown by the broken circle at a certain time, and continued away from the Earth at speed v . Meanwhile the light proceeded toward the Earth at speed c , taking a time $t = r'/c$ to reach the Earth from the boundary at position 1. During this time, the boundary expanded to radius r , by an amount vt . Thus $t = r'/c$, and also $r - r' = vt$. So $t = r/(c + v)$. If r is in light years, t would be in years.

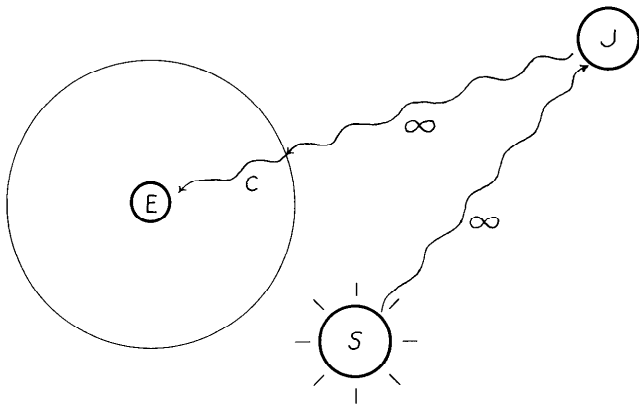


Figure 3. While the Sun was outside the boundary, reflecting bodies, such as Jupiter, indicated by J, were seen reduced in brightness and redder than now. These conditions might be called level 1 of color and brightness.

The power reflected per unit of time, or brightness, will follow a similar reduction. However, as soon as the boundary passed the Sun, the speed of light going from the Sun to Jupiter would reduce to c . This would mean that as an observer on Jupiter watched the Sun it would become dimmer and redder. The reason for the brightness and color change is basically the same as for what the Earth observer saw. Since the speed of light from the boundary to Jupiter is infinite, as light reaches the boundary, it reaches Jupiter. Since the boundary recedes from the Sun at velocity v , the frequency received on Jupiter, f' , compared to the frequency emitted from the Sun is $f' = fc/(c + v)$. The brightness, related to the power output per unit time, will diminish to the same extent as the frequency, for the same reason. After striking Jupiter the light would return to Earth, be red-shifted and reduced in power once more, as in the above calculation; and Jupiter would become dimmer and redder even than before; and f'' , the frequency seen on Earth from the reflection from Jupiter would be: $f'' = f(c - v)/(c + v)$ (Figure 4). In fact all light in the direction of the boundary would reduce in intensity and red-shift.³ The reason is that the light would have to pass through the boundary, and as it penetrated the boundary it would be slowed down to speed c , red-shifted and dim. It would continue at this speed until it caught up with the other side of the boundary, where once again it would red-shift and dim.

The Earth observer would continue to see Jupiter for a further 8 minutes at level 1 of brightness and color, after the boundary had passed the Sun, until all the light that had already reached the boundary had travelled to the Earth. After 86 minutes at velocity $v = c/2$ of the boundary, the observer on Jupiter would again see the Sun at its normal brightness and color since the boundary would have reached the planet by then. The light would then journey to Earth taking approximately 86 more minutes. This would mean that Jupiter would have been at this lower level, level 2, for a total of $(2 \times 86) - 8$, or 164 minutes.

However, this may not have been noticed by the two Earth observers present at the time, since they were pre-occupied with hiding from God, and making clothes out

of fig-leaves (Genesis 2:7-10). Anyway, since this occurred probably in the afternoon where Adam and Eve were situated, looking at Genesis 2:8, even if Jupiter were above the horizon it could not have been seen in the daylight.

A Closer Consideration of the Nature of the Boundary

If we look carefully at the composition of the boundary, it could be seen that it could not be a two-dimensional wave (i.e., a spherical shaped surface), expanding out from the Earth. For if it were, light from a given star would arrive at all places on the half of the boundary facing it, in phase. According to Huygen's principle these places would act as secondary sources, and being all in phase would give spherical waves converging on the Earth. Or, looking at Snell's law of refraction, since the index of refraction inside the boundary would be infinite relative to the outside, the light would be refracted normally to the surface, i.e., radially, focusing on the Earth.⁴ This would effectively spread the star's light out over the whole of the hemisphere. Since this is not observed, the boundary must be viewed as being diffuse, probably stretching out infinitely before the speed of light was actually infinite. This would answer another problem that would arise with a discrete boundary. With the discrete boundary all stars outside the boundary would be red-shifted by the same amount, the same as the Sun while outside, which is not borne out by observation. However, with a diffuse boundary the red shift would depend on the distance the star was from the Earth (or the boundary which is proportional to the distance from the Earth). This is the fact observed about the red shift. Also it may make the stars seem further away due to the reduction in brightness because of slowing through the boundary and the effect of apparent depth. The difference in substituting a diffuse boundary for a discrete one is largely a matter of degree, so the points mentioned remain true

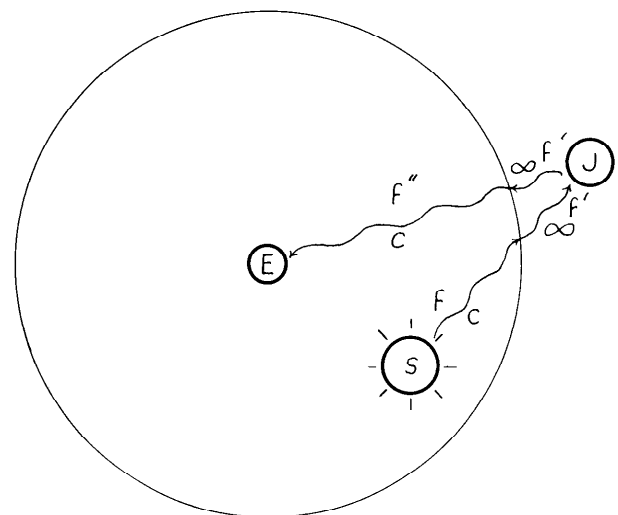


Figure 4. When the boundary passed the Sun the light was slowed down. Moreover, as the light passed through the boundary it was red-shifted, and reduced in brightness. So it became quite dark on Jupiter for a time; and on Earth, Jupiter was seen (if anyone noticed) at what might be called level 2 of color and brightness.

qualitatively where they may change quantitatively; and it is easier to demonstrate the situation using a discrete boundary.

Suggestions for Further Development

Members may like to pick up the ball at this point to try to develop the following points:

1. What kind of red shift would appear for various stars?
2. What would be the effect of the variation of the speed of light gradually with distance from the Earth?
3. What would be the effect on formulac containing the speed of light as a constant; which ones would change and which ones would not?

Conclusion

I realize that this is just an initial idea, but I feel that this theory could probably be refined by other readers, and I would welcome their expansions or opinions of it. However, this does provide at least one alternative to

the problem raised, without the question arising of God showing us things that never occurred.

Acknowledgments

I should like to acknowledge the help of Mr. Harold Armstrong, M.Sc., in preparing this paper, and of Mr. Mike Leich-Devlin, B.Sc., in giving me the original idea.

References

- ¹Neilson, Lewis, 1977. Certainties, less than certainties, and evolution. *Creation Research Society Quarterly* 14(3):180-182.
- ²See the discussion of the Doppler effect in the part on waves of any elementary work on physics.
- ³Oddly, this last result is just what a relativistic treatment would give. A relativistic treatment of the previous case would give a somewhat different result; but provided v be somewhat less than c the actual difference would be negligible.
- ⁴These matters are considered, under optics, in any elementary work on physics.
- Incidentally, effects of Snell's law might arise in other cases, such as when the Earth and the Sun were inside the boundary, but Jupiter outside it, as considered. However, such points may be left for later consideration.

VARIATION AND FIXITY AMONG LIVING THINGS. A NEW BIOLOGICAL PRINCIPLE

FRANK L. MARSH*

Received November 21, 1977

This article lists the processes of variation which occur among plants and animals, and shows that a true fixity exists in nature at the level of the basic type. The presence of discontinuities between basic types is shown; and a new biological principle is stated: the Principle of Limitation of Variation among Organisms. This principle may be stated as follows: processes of biological variation can go no further than to produce new variants within basic types already in existence.

Variety

One of the delightful things in our natural world is the abundance of objects which challenge our physical senses. In the matter of *number* of living forms alone, taxonomists tell us there are well over one quarter of a million "species" or "kinds" (ignore the distinction for the moment) of plants, and one and one quarter million "kinds" of animals. No wonder we have trouble in our gardens!

There is indeed great variety among the different basic kinds of plants and animals, but in this article I wish to discuss the variation in form and structure which occurs *within the basic types*. By basic types I refer to animals as different as dogs and horses, and to plants as different as roses and sunflowers.

Fixity

The second noun in our title is "fixity" which, as a biological term, comes to us by way of the teachers of theology in the great church-connected universities of Europe. (Which all were, until not long ago.) What was

taught in the area of origins by the theologians in these schools during the eighteenth and nineteenth centuries is made clear by the English historian Sir William Cecil Dampier as follows:

"The emphasis laid by the Protestant Reformation on the verbal inspiration of the Bible led to a more literal interpretation, and by the eighteenth century an acceptance of the details of the story of organic creation, as given in the first chapter of Genesis, became necessary to orthodoxy. In the nineteenth it was apparently believed by almost the whole Christian world."¹

For in the early nineteenth century (in contrast to the situation today, when much scepticism may be found even in schools of theology) most academics (most of whom were then clergy) accepted Genesis quite literally. Many even went beyond the literal reading, it appears, and declared that the expressions in Genesis 1, "after his kind," "after its kind," "after their kind" (See New American Standard Bible), meant that *no variation* could occur within the basic kinds. Furthermore, these theologians apparently taught that the plants and animals had been created in their forms of that day and set on the earth in the very areas where they were found in the 1820's. (It is hard to see how such a belief would

*Frank L. Marsh, Ph.D., is Professor Emeritus of Biology at Andrews University, and lives at 216 Hillcrest Drive, Berrien Springs, Michigan 49103.

be reconciled with Genesis 8:17.) Actually the Bible nowhere speaks of “no variation” and “no migration.” This teaching regarding no variation has been called the Doctrine of Extreme Fixity. This was the introduction of the word “fixity” into biological literature. Sometimes this belief was referred to as “the Doctrine of Immutable Species,” i.e., “not capable or susceptible of change.” Nordenskiöld says here, “To Darwin, . . . ‘immutable’ and ‘created’ in regard to species, are inseparable terms.”²

Darwin's Studies

Darwin apparently started on his voyage around the world believing that “no variation and no migration” was the true teaching of Genesis. In the words of Nordenskiöld,

“He (Darwin) was, moreover, in his youth a firm believer in the Christian faith—he intended, in fact, to become a clergyman—and he accepted without criticism the traditional dogmas including, of course, the doctrine of the origin of living species as the result of a divine act of creation. During his voyage, however, he found that this belief conflicted with the results of his observation.”³

Darwin's observations, which revealed both variation within kinds and migration over the earth's surface, placed him in direct confrontation with his understanding of the doctrine about the origins in Genesis. Actually, he seems at that time to have had no desire at all to believe contrary to the common interpretation of Genesis; but with his own eyes he had seen both variation and evidences of migration. This situation worried him very much. This mental struggle is revealed by Darwin in the following extract from a letter written by him to the English botanist J. D. Hooker:

“In 1844 he writes in a letter to his friend the botanist Hooker: ‘I have read heaps of agricultural books and have never ceased collecting facts. At last gleams of light have come, and I am almost convinced (quite contrary to the opinion I started with) that species are not (it is like confessing a murder) immutable.’”⁴

Most unfortunately Darwin appears not to have studied Genesis carefully for himself. He believed (so far as he thought about it) that his teachers had interpreted Genesis correctly; and that his discovery of variation and migration had shown that the Genesis account could not be accepted. Tragically he went on, as have many since Darwin's day, to conclude that he had disproved Genesis when all he had done was to disprove an extreme *interpretation of Genesis*. Those who read Genesis for themselves will find nothing said about no variation and no migration. They *will* find that basic types were created after their kinds (Genesis 1), and that the land animals were to migrate from the ark (whether or no they were created at one place) and “breed abundantly on the earth, and be fruitful and multiply on the earth.” Genesis 8:17 NASB.

But Darwin Went Beyond His Observations

The effect upon Darwin himself of thinking he had disproved the Biblical account of special creation was to cause his imagination to run away with him to the

conclusion that there was no law-bound force in nature—variation, for example, could occur without limitation—or if there were a natural law here it would be one which produced uninterrupted development. In nurturing this idea Darwin found a powerful assist in the geologist Charles Lyell's book, *Principles of Geology*. Regarding the mutual helpfulness of Darwin and Lyell in furthering an idea of a fundamental progressive force in nature, Nordenskiöld says,

“But the main point is that Lyell's theory of geological evolution offered at the time particularly valuable support to the idea of evolution, which was one of the watchwords of the age; here indeed there was confirmation in nature herself of the idea of an uninterrupted development as the fundamental force in existence.”⁵

“Belief in a gradually progressive, law-bound development has always been limited to a few, and these perhaps are to be found among the men of action rather than the men of thoughts and words. The most pronounced faith in progress that has ever existed has been the liberalism of the nineteenth century, a current of ideas which had just reached its zenith by the middle of the century, when the theory of origin came to the fore. The coincidence is of course not accidental; on the contrary, the one idea is dependent on the other, and therefore the victory of Darwinism is inexplicable without some insight into the general intellectual conditions at the time of its birth.”⁶

Darwinism won in the view of the majority, because it assumed and described an attractive fundamental force of continual development, improvement, and progress in nature. Upon an acceptance of this undemonstrated progressive principle in nature the term “fixity” was discarded, except as a collector's item from a past age.

Variation and Fixity

Variation suggests divergence, variance; *fixity* suggests stability. Possibly we should ask, “Can variation and fixity occur in the same population of living organisms? If a population varies how can it be fixed?; if it is fixed how can it vary?” It just may be that the term “fixity” is of great value to us today.

As individual biologists it is very important that we rediscover first if variation *can* occur in the population of a basic type, and second, if it does occur, how far can it go in chemical and corresponding morphological change? It took a voyage around the world to prove to Darwin that variation did occur within basic types. We can know the fact vicariously by a short trip to the library and taking down a few volumes by present-day reputable taxonomists. Here are a few scattering illustrations of what we discover:

1. Hitchcock lists 64 species of bluegrass in the United States.
2. Gray lists 17 species of the common thistle, and 51 species of violets.
3. Sargent catalogs 24 species of willows, 54 species of oaks, and 153 species of the hawthorn or red haw.

4. Hall and Kelson list, for the United States, 66 subspecies of the deer mouse, 66 subspecies of the northern pocket gopher, and 214 subspecies of the southern pocket gopher.
5. Walker lists 12 species of true cattle in the world.
6. Over 30 subspecies of the song sparrow have been listed for the United States.
7. Griffith Taylor names 160 distinct breeds of man on the earth.
8. And who wishes to tell us the number of varieties of dogs, cats, corn, beans, or any other domesticated plant or animal?

Indeed, variation generally *does occur* within basic types. Darwin should receive credit for being among the first to make this delightful fact apparent to the world. Interestingly, there are a few basic types which *do* apparently show extreme fixity—offspring are as like their parents as coins are like the die that stamps them. These include the ginkgo tree, the coelacanth fish, the thistle butterfly, the American eel, some chalcid wasps, the garden weed purselane, and a few more. The factors of their hereditary systems seem to be in so stable a state as to prevent the formation of variants.

But most basic types of organisms do show variation. What produces these variants in the basic types? Here is where the geneticists come in, and they give us the facts for the following Outline of Variation:

Types of Variation

There are two large classes of variation: 1. Non-hereditary (environmental, nongenetic), and 2. Hereditary (genetic).

1. Environmental. Example: an 80-foot Englemann spruce at 9,000 feet elevation in the Rockies, and grotesque dwarf Englemann spruce at timberline (10,000 to 11,000 feet). Environmental variation does not affect the germ line. I.e., if seeds are planted in a new environment, the plants will be according to the new environment, not the old.

2. Hereditary.

(a) Recombinations of genes: Produce throwbacks but nothing basically new. Example: Red-and-white calf born to established black-and-white Holstein cattle line.

(b) Gene mutations (chemical changes in genes at the level of the nucleotides) (1) Visible, (2) Biochemical, (3) Lethal.

(1) Visible. Examples: Short-legged Ancon sheep, albino forms, double flowers, red sunflower, Concord grape, calico corn, bulldog-faced dog, pacing gait in horse.

(2) Biochemical. Causes inability to make a certain essential amino acid or protein.

(3) Lethal. Causes early death if in double recessive (homozygous) combination, or possible living freaks if heterozygous. Example: Creeper fowl in poultry.

(c) Chromosomal aberration (chromosomal mutation): (1) Changes in chromosome number, (2) Changes in chromosome structure.

(1) Changes in chromosome number. Haploidy (single chromosome of each set present), polyploidy (more than two chromosomes present in each set). Examples: Autopolyploidy

(hybridization within one species), and allopolyploidy (hybridization between two species), and heteroploidy (abnormal number of chromosomes in a single set, but not a simple multiple of the haploid number). Example: Variants in Jimson weed.

(2) Changes in chromosome structure.

Deficiency or deletion—loss of one or more genes. Examples: Notched wing in *Drosophila*, waltzing gait in mice.

Duplication—addition of one or more genes in chromosome. Example: In *Drosophila*, roughening of eyes, changes in wing shape, and modified bristles.

Translocation, or segmental interchange—exchange of parts between nonhomologous chromosomes. Example: Produces variants within a basic type.

Inversion, or rotation of a block of genes within a chromosome. Example: New species of *Drosophila*, grasshoppers, and some plants.

Hybridization

Hybridization (referred to in 2(c)(1) above) is probably the single greatest source of new variants. Witness the enormous number of hybrids among our domesticated plants and animals today. If we could only cross two different basic types we would surely get a new basic type. However, all practical and laboratory evidence indicates that if two organisms are sufficiently different morphologically to constitute two different basic types, they *can not hybridize*. To say this the other way around, in every verified instance where cross breeding has occurred the two partners have been sufficiently alike morphologically to belong to the same basic type. There is *no* exception to this principle in natural sexual reproduction.

Basic Types are Fixed

In the above categories we have listed all known ways of producing a new variant. After many years of practical experience and laboratory study of these processes of variation the conclusion is that not one nor all these ways of accomplishing variation have ever produced any basically new organisms. New variants indeed do appear in existing basic types, but *no new basic types* have resulted. By present-day definition microevolution (variation within a basic group) has occurred; but no empirical evidence exists that macroevolution (formation of a new basic type) ever occurred; rather the evidence is against it.

And now we return to the term “fixity.” In harmony with every laboratory finding and common experience, we discover that there *is* a fixity in nature; but that fixity exists, not at the level of, e.g., varieties of dogs, but rather at the level of the *dog kind* (the dog basic type).

Most evolutionists conceive of a hypothetical phylogenetic tree in which all members are genetically related. (A few seem to envisage some separate origins.) This means that if the concept is true one should be able, in the realm of morphology, to follow continuously link by link from any organism to any other organ-

ism. But in nature this *cannot be done*. We discover that every basic type, with its population of more or less variants, is isolated from every other basic type. It is as if each basic type were surrounded by a "wall" which preserves the integrity of the basic type and prevents it from ever forming any new basic type. Variation can do no more than produce a new variant within the "wall" of that basic type. This wall (chemical separation) makes crossing of two basic types impossible. This biological isolation of basic types from one another is called *discontinuity* (see Dobzhansky¹), and this discontinuity between basic types is in every sense a *bridgeless abyss*. The situation is exactly as stated in Genesis: God by separate acts created the discrete kinds of plants and animals.

The Principle of Limitation of Variation

This brings us to the unveiling of a new basic biological principle, a principle as important as that of "Life Only from Life." This principle or natural law may be named and stated as follows: The basic biological principle of *Limitation of Variation*: Processes of biological variation can go no farther than to produce new variants within basic types already in existence.

To my knowledge the only place in biological literature where this principle has been recognized as such is at the bottom of page 105 of my recent book *Variation and Fixity in Nature*.²

Why is it that this extremely important, thoroughly demonstrated principle of biology, one which is verified by *every* pertinent laboratory finding, has not been recognized in nature by our modern biologists? How can this happen in modern science where the watchword is "open-minded study"? Help in answering these

questions may be found on page 154 in the English evolutionist physiologist G. A. Kerkut's book, *Implications of Evolution*.³ Kerkut warns that extrapolating beyond demonstrable evidence which bears on origins may lead to a blind acceptance of an hypothesis which will close our eyes to yet undiscovered facts. Only a "short step in logic," wishful extrapolation, and great faith (presumption?) in an hypothesis can cause a scientist to ignore the completely demonstrated biological principle of Limitation of Variation.

References

- ¹Dampier, Sir William Cecil, 1944. A history of science. The Macmillan Company, New York. P. 334.
 - ²Nordenskiöld, Eric, 1928. The history of biology. Alfred A. Knopp, Inc., New York. P. 466.
 - ³*Ibid.*, p. 463.
 - ⁴*Ibid.*, p. 463.
 - ⁵*Ibid.*, p. 457.
 - ⁶*Ibid.*, p. 458.
 - ⁷Dobzhansky, Theodosius, 1970. Genetics of the evolutionary process. Columbia University Press, New York. Pp. 21 & 22.
 - ⁸Marsh, Frank L., 1976. Variation and fixity in nature. Pacific Press Publishing Association, Mountain View, California. P. 105.
 - ⁹Kerkut, G. A., 1960. Implications of evolution. Pergamon Press, New York. P. 154.
- Editor's Note: Is it possible that the theologians of about 1820 were thinking of fixity of the Genesis kinds, the basic kinds mentioned here; but that they spoke of them as species? For the theologians were likely more familiar with Aristotle's writings than with Linnaeus'; and Aristotle meant by species something like the basic kind. See, e.g., his *Categories*, chapter 5. But those who had studied biology would likely have interpreted the species in a narrower sense. If this suggestion is true, in a real sense the Darwinian dogma arose out of confusion.
- It may be fair to remark that in Darwin's own time, Fleeming Jenkin, for one, expressed the fact that variability is limited, although he did not call the fact a principle, nor use the name proposed here. See Siegler, Hilbert R., 1976. Fleeming Jenkin's critique of Darwin's Origin of Species. *Creation Research Society Quarterly* 13(2):111-114. But he apparently got little hearing.

NEW ORGANIZATION TO UPHOLD BIBLICAL INERRANCY

Word has been received of the formation of an International Council on Biblical Inerrancy. The purpose of the Council is to publish literature, to conduct seminars and conferences, and to take other steps to strengthen and propagate the doctrine of inerrancy.

As an early stage in the work, a summit meeting is planned for October 1978.

More information can be obtained from Dr. J. Grimstead, International Council on Biblical Inerrancy, Post Office Box 13261, Oakland, California 94661.

The Things Which One Can Study!

St. Thomas Aquinas, in his *Prologue to a Sermon on the Creed*, used the following illustration: "... if man could know perfectly all things ... it would be stupid to believe what we do not see. However, our knowledge is so imperfect that no philosopher has ever been able to make a perfect investigation of the nature of one fly. We read that a certain philosopher spent thirty years in solitude, so that he might study the nature of a bee. If our intellect is so feeble, then, is it not stupid to refuse to believe anything about God, other than what man can know by himself?" (This is included in *The Pocket*

Aquinas, ed. Vernon J. Bourke, 1960. Washington Square Press, New York. pp. 385 & 286.

It does not seem to be stated who the philosopher mentioned was. Maybe this remark was intended as a half-humorous illustration.

However, (and this is the point to be made here) is it not surprising how the matter has turned out? For there now are philosophers, natural philosophers, that is, and hundreds, maybe thousands, of them, who devote their time to the study of a fly. Of course, the fly is now called *Drosophila*.

THERMODYNAMICS, ENERGY, MATTER, AND FORM

H. L. ARMSTRONG*

The dichotomy of matter and energy is very common in physical discussions. It is suggested here that both matter and energy are, in a sense, to be considered as the materials of things. An alternate dichotomy, then, is the old one of form and matter. Matter is conserved, forms are replicated; but neither matter nor form arises from nothing. The consideration, that forms arise only from pre-existing forms, is enough to reveal the impossibility of evolution. Thus, the argument about forms may serve as a useful alternate to the common appeal by Creationists to the second law of thermodynamics.

Creationists often make much, in arguments, of the laws of thermodynamics, especially the second. Certainly the points expressed thus: that from nothing comes nothing, and that from disorder order does not come spontaneously, are valid.^{1,2}

There may, however, be difficulties, especially with an appeal to the second law. Because of the way in which that law was established, there may be a tendency to bring in considerations quite foreign to the Creationist's purpose. Also, opponents are likely to quibble about open and closed systems.

One may wonder, then, whether there may be some law or principle, somewhat more general and not presenting these difficulties. It is suggested that indeed there is such a principle, and that it may be very useful. After some preliminary discussion, the proposed principle will be stated.

Conservation and the First Law

The first law of thermodynamics is really a statement of conservation of energy, especially as it applies to mechanical and thermal processes, which are often what are being considered. In physical science there are two principles of conservation which are often mentioned: conservation of energy and of mass (or matter). These quantities are said to be conserved, that is, to remain the same.³

It is better to speak of conservation of mass than of matter. For conservation is a quantitative notion; it is a quantity which is conserved. Both energy and mass are, in this sense, quantities; it is often said, after Newton, that mass is the quantity of matter. Besides, matter, in so far as it is matter and nothing else, must remain unknown; then it would not be known whether or not it was conserved.

It is sometimes said that, according to the theory of relativity, it is mass and energy together which is conserved. That notion will be examined in an appendix; and it will be found that each is conserved independently, but that usually the processes going on involve both.

Matter vs. Energy

In many discussions, matter (now scarcely considered synonymous with mass) and energy are presented as the two contrasting things in physical science. Such a contrast is strange, if it is proposed to go on and argue that they are the same thing, essentially, as is often done. While the more extreme doctrine that they are the same is repudiated here, it will be seen that they do have

something in common. Thus it seems advisable to look for a different antithesis.

Matter and Form

In fact, such an antithesis was known at least from Aristotle's time, and it had great use especially among the Schoolmen. The antithesis meant is that of matter and form.⁴

Matter, in this context, means much the same as material. It is the material element in things.

Form means, in a sense, the way in which the material is used. For a statue, as the ancients used to say, the material is marble, or whatever it may be; the form is the shape of the statue. The matter, or material, of a house is lumber, bricks, etc.; the form is the design. The matter of a machine is steel, for instance; the form is the design and the function of the machine.

Consider the work in a foundry. The matter is the pig iron which is used. The forms are, or are incorporated in, the molds. One great difference between form and matter is apparent here. When the supply of iron is exhausted, nothing more can be made. Matter, it might be said, is that of which there is only so much. The same amount of iron, in finished products and in scrap, leaves the foundry as entered it in pigs. The matter is conserved.

As for the form, the same mold could, in principle at least, be used over and over. (This is true at least in principle. The actual current practices in a working foundry are not to the point here.) And how were the molds made? From patterns, which likewise incorporated the forms of the things to be made.

Is the point not plain, then? Matter is conserved. Once a certain amount of matter is used for something, it is out of circulation, until the thing in which it was used is melted down, or whatever may be necessary to recover the matter done.

Forms, on the other hand, are replicated. The form came from a previously existing form; the mold from the pattern, for instance.

Incidentally, since energy, too, is conserved, it may be convenient, as is suggested in the appendix, to count it in as matter, in a sense.

Three Ways in Which a Form Can Exist

It has been said that forms are replicated; that a form comes from a previously existing form. That is true; but it is necessary to distinguish the different ways in which forms can exist.

First of all, they can exist as the form of some matter. The form of the statue exists as the form of a piece of marble. The form of the casting exists as the form of

*H. L. Armstrong, M.Sc., teaches Physics at Queen's University, Kingston, Ontario, Canada.

some iron, the form and matter together making up the casting. It also existed, in much the same way, in the mold and in the pattern.

A second way in which a form may exist is in matter, but in pieces. Consider, for instance, an automatic lathe, making some machine part. The form of the part exists in the cams, followers, levers, etc., of the lathe. So it is still material, but in several parts.

This printed page may furnish another example. When it had been set up in type, its form existed in the type. But now consider an earlier stage: the typewritten manuscript. Its form existed, before the typewriting had been done, partly in the typist's soul, as will be explained; but partly in the typewriter, in pieces.

What is meant by "in pieces" (or parts), is this. The forms of the letters, which are parts of the total form, existed in the typewriter. So did the spaces between letters, for instance; but they existed in the form of the spaces between notches in the control of the carriage. So the form existed in parts; these parts were assembled under the typist's control.

The third way in which a form may exist is in a soul, or mind. The word "soul" is used here in Aristotle's sense; the Christian sense includes and goes beyond that. The order of the letters in the manuscript, for instance, existed at one stage in the typist's soul. And the form of the statue, before the statue had been carved, existed in the sculptor's soul.⁵

There is a special point about the existence of a form in matter, but in parts. The thing in which the form exists will always be considerably more complicated than the form itself. Few would deny that the typewriter is more complicated than the sheet of manuscript. And the automatic lathe is certainly much more complicated than the thing which it is making.

It is easy to see why this must be so. For the thing under discussion, the typewriter, automatic lathe, or whatever it may be, must not only contain all of the parts of the form which it will reproduce, but also it must embody its own form. So naturally it is a more complicated thing.

The Potential Existence of Forms in the Soul

It is necessary to consider a little more of the existence of forms in the soul. For the sculptor did not consciously have the form of the statue in his soul from childhood; he was not always thinking about it.

It must be said, then, that the soul contains all forms, but potentially. Aristotle distinguished two senses of this potentiality. When the sculptor was an infant, then he was potentially a sculptor, in that, being human, he had the ability to learn the art in due time. Later, when he had become a sculptor, it was potentially in his soul in that, when he set himself to thinking about it, he could give the form to the marble to make the statue.⁶

The Impossibility of Evolution

That there are many forms in the world today, none will deny. And many of them, especially the forms of living beings, are most complicated. How did they come about?

It was proposed above that a form comes from a pre-existing form. But the evolutionist would admit that there was a time when the Earth was without form. In this, at least, he would agree with Genesis.

But suppose that there was a time when there was nothing but a cloud of dust, or of nebula, or whatever the current fashion may be. Certainly the forms of planets and stars, let alone living things, did not exist materially in it as stars, planets, and living things.

Neither did these forms exist materially in parts. For how could they have done so? Besides, it has been shown that such an existence demands something even more complicated than the form in question; and how would that be found in a featureless cloud of stuff?

Finally, the evolutionist, if he is of the usual materialistic type, can not claim that the forms then existed in a soul. For he will not admit that there is such a thing as a soul. So he has no way of accounting for the variety of things which now admittedly exist.

All that he can do is argue that forms need not come from pre-existing forms. But then one may appeal to induction, and show that in every case in which one can trace whence the form came, it came from a pre-existing one. So the evolutionist has not a leg to stand on.

Note that the evolutionist in mind here was a materialistic evolutionist. A theistic evolutionist might not be affected so much by this argument; it would be necessary to argue with him on other grounds.⁷

The Creationist's Viewpoint

The Creationist grants—nay, insists—that there was a time when all of the forms did not exist in the world in a material way. But this causes him no trouble. For then they existed in God. For certain aspects of God's being are analogous to the human soul, but infinitely more powerful. So, just as at one time the form of the statue was in the sculptor's soul, so at one time the forms of all of the things which are in the world were in God.

Indeed, it is not too strong a statement to say that the admission that forms can come only from pre-existing forms logically compels one to admit that there is a Creator.

Conclusion

It has been argued, then, that much of the same conclusions as it is often proposed to reach by the second law of thermodynamics can be reached by using the principle that forms come only from pre-existing forms. And such an argument leaves no room for quibbles about open and closed systems.

It is not proposed, of course, that this principle supersede the second law generally. In the first place, the second law, being a more quantitative thing, will continue to be needed for purposes of calculation in engineering and other fields. Also, the term "second law of thermodynamics" has been used so much by Creationists that it will likely continue to be used. But in such cases there may be a possibility of meeting quibbles by an appeal to this principle of forms, as something more general.

The Second Law Again

It is often noted that the second law of thermodynamics implies that in every process some energy becomes unavailable. Is that not true of matter also? A machine shop produces scrap; carpentry, useless ends of boards; and so in other cases. This view may be useful if energy and matter are to be considered together.

Is something the same not true of forms at each replication? If a casting is used to make a mold, the mold to make another casting, and so on, flaws will accumulate, until the result is useless. Likewise if a book is copied many times. One might say that the original form becomes less and less available.

It is hoped, in a subsequent issue, to have an appendix, discussing in more detail certain points about conservation.

References

- ¹Williams, Emmett L., 1973. Thermodynamics: a tool for Creationists. *Creation Research Society Quarterly* 10(1):38-44.
- ²Morris, Henry M., 1970. Evolution theory and thermodynamics. *Creation Research Society Quarterly* 6(4):199-200.
- ³Armstrong, H. L., 1975. Use of the second law of thermodynamics in macroscopic form in Creation studies. *Creation Research Society Quarterly* 12(2):103-106.
- ⁴Cardinal Mercier and others. A manual of modern Scholastic philosophy. Third English edition, translated by T. L. Parker and S. A. Parker, 1960. Routledge and Kegan Paul, London. Volume 1, pp. 506-508.
- ⁵Aristotle, *Metaphysics*, Book VII, Chapter 7.
- ⁶Aristotle, *On the Soul*, Book II, Chapter 5.
- ⁷Armstrong, H. L., 1976. An examination of theistic evolution. *Creation Research Society Quarterly* 13(2):108-110.

REPORT OF 1978 BOARD OF DIRECTORS MEETING

The annual meeting of the Board of Directors of the Creation Research Society was held at Concordia College, Ann Arbor, Michigan, beginning at 1830 Friday, 21 April 1978, with a time of silent prayer. Present were: G. Howe, E. Williams, H. Armstrong, W. Frair, R. Korthals, W. Rusch, T. Barnes, D. Boylan, C. Burdick, D. Gish, J. Klotz, W. Lammerts, J. Meyer, J. Moore, G. Mulfinger, H. Slusher, W. Tinkle. Absent: H. Morris. Visitors were welcomed by President Howe. Ladies among the visitors kindly provided refreshments during the break.

The minutes of the meeting of 1977 were read and approved. The secretary reported that 217 ballots had been cast in the election and the six incumbents in the slate of ten were reelected. (See June *Quarterly*.) The Student Chapter constitutional amendment (Article III, Section 3) was passed by a vote of 211 to 6.

Treasurer Korthals disclosed that income for the year was \$37,204.88; total expenses were \$36,302.16; and the balance in accounts as of 31 March 1978 was \$47,323.33.

Rusch, the membership secretary, reported that there are now 595 voting members, 1152 sustaining members, 95 subscribers, 412 student members, 180 library subscriptions, 16 school subscriptions, and 6 church subscriptions, giving a total of 2466. Changes of addresses should be referred to Rusch's office. Notices, and second notices if necessary, are sent about renewal; but members and subscribers need not wait for them.

Rusch reported on the C.R.S. biology books. Sales have been: textbook—56,900; teacher's guide—3,000; student's lab manual—14,000; teacher's manual with answers—2500. Rusch also reported on the Textbook Committee meetings dealing with options regarding revisions.

Armstrong, editor of the *C.R.S. Quarterly*, reported that it has remained and will continue at about 230 pages per year. He always appreciates receiving suggestions from readers.

Meyer reported on new membership brochures, 10,000 of which were printed at a cost of \$772.50. Also he hopes soon to have bulletin board posters available for use primarily in science departments of colleges and universities. Meyer also reported advertising in *The Sword of the Lord*. *Scientific American* had refused to print a C.R.S. advertisement; so one will be placed in *Science* or *Nature*. During the past year 40 news releases were sent out.

Slusher described the El Paso, Texas, student chapter, which is the first student chapter and presently has three to nine members. Meetings are held every two weeks, and student reports are given on creation subjects. Slusher urges development of chapters elsewhere. He may be contacted for help.

Williams, chairman of the Research Committee, introduced Dr. Henry D. Voss who was followed by Professor M. E. Clark and Dr. Sherman Kanagy in describing some of their research on the action of water in a large circular flume. Meyer announced a projected island biogeographical study which could be undertaken at Sheva Temple in the Grand Canyon.

Mulfinger reported progress on preparation of technical monographs. Efforts are being made not only to reprint some old works, but also to produce some contemporary "state-of-the-art" publications.

Barnes discussed participation on "Openness as a Principle in Science". He has about 600 signers and hopes to get more.

The meeting was adjourned at 2320.

Next session was called to order on Saturday, 22 April, at 0905 and began with a period of silent prayer. Consideration was given to encouraging distribution of the article by W. R. Bird published in *The Yale Law Journal* 87(3), January 1978, dealing with legal aspects of teaching religion and science in public schools. Also the book, *The Separation Illusion*, by John W. Whitehead; 1977; published by Mott Media, Box 236, Milford, MI 48042; cost, \$4.25; was discussed. It was

pointed out that there is wisdom in separating religious from scientific creationism.

Moore explained his opportunity to present creationism in Michigan State University, and he distributed outlines of his courses.

The 1979 Annual will deal with experimental research regarding what happened in the first few centuries after the flood. Tinkle urged members of the board to write for the *Quarterly*.

The *Scientific American* advertising situation (with possible legal action) was discussed and there may be some further correspondence with them regarding this. There followed a discussion whether we should make more generally known that there will be an open Friday evening meeting when research will be discussed.

There was consideration of the possibility of advertisements in the *Quarterly* since second-class mailing rate is now being used.

The following motions were carried:

1. that the board authorize expenditures for 5000 advertising posters at a cost of about \$800.00;
2. that the board authorize printing an additional 10,000 C.R.S. brochures when needed;
3. that subsequent to 22 April 1978 board nominees shall have written some scholarly publications in creation research which is to include papers in *Creation Research Society Quarterly*, papers in other peer review journals, symposium chapters, or major books;
4. that the Executive Committee propose an amendment to the bylaws listing requirements

for membership to the board;

5. that the Textbook Committee prepare a new manuscript for a high school level biology textbook instead of a revision of the existing biology textbook; the new manuscript of the book would be submitted to Mott Media for publication under specific contract;
6. that Harold Armstrong be reappointed as editor for another three years, the term starting spring of 1979;
7. that the five incumbents of the Board of Directors whose terms would expire be renominated and that appreciation be expressed to Walter Lammerts for many years of service with regrets for his withdrawing his name from renomination. Other nominations were made. (Elsewhere in this issue the complete slate is listed.);
8. that present officers of the board should be retained;
9. that the meeting for 1979 be held at Concordia College, Ann Arbor, Michigan, 20 and 21 April, beginning at 1800, 20 April; and that a committee study the feasibility of a rotational schedule for the meetings.

Members of the Board of Directors were encouraged to arrive in Ann Arbor as early as noon on Thursday, 19 April 1979, for informal discussions and committee meetings.

The executive session adjourned at 1500.

Wayne Frair, Secretary

EXCERPTS FROM THE BYLAWS

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 50 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.

SPECIAL NOTICE

The following candidates have been nominated to the Board of Directors to serve for a three-year term beginning in 1979.

John W. Klotz
Richard G. Korthals
Henry M. Morris
Wilbert H. Rusch
Harold S. Slusher
E. Norbert Smith
Erich von Fange

Six members are to be elected to the Board. The date of the annual election is 1 March 1979. Biographical information on each nominee will be distributed with the ballots.

PANORAMA OF SCIENCE

Light on the Recency of Creation

The zodiacal light, of which a striking display is shown on the front cover, can provide good evidence that the universe is young. This light is seen just after sunset or just before sunrise, especially in the tropics. In higher latitudes, it is commonly hidden by the long twilight. It is believed to be the sunlight reflected off a multitude of tiny particles, moving around the Sun in orbits more or less in the plane of the ecliptic.

It has been pointed out before, in the *Quarterly*, that the existence of dust in interplanetary space is good evidence of a young universe. For by the Poynting-Robertson effect, and for other reasons too, the dust is removed from the Solar System.¹ The article in which this picture was featured agrees, stating that dust should be swept out of the System in about 10,000 years.²

Some, to extend this time, propose that dust is continually coming from the breaking up of comets or asteroids. But that just shifts the problem. For the comets and asteroids do not last forever;³ so the fact that they still exist is more evidence for a young Solar System.

Living God—not Living Planet

A recent essay "The Gaea Hypothesis—our Living Planet" has suggested that we think of the Earth, along with the atmosphere and the living things, as one living entity, to be called "Gaea".⁴ The arguments given are the obvious fitness of the Earth as a home for living beings. The fitness no one disputes; but it surely does not prove that the Earth is living in any meaningful sense. After all, my house is fitting; but that does not show that it is alive. Rather, it shows that an intelligent being is taking care of it. Is the case not similar with the Earth? But we know that it is not human care which the Earth receives; must it not be superhuman care, by God Himself?

Readers who can get to read the whole of this essay will find it interesting. They should be warned, however, to take some statements with more than a

grain of salt. For instance, it is stated that formerly the Earth's atmosphere contained no oxygen. But good reasons have been given for think that the atmosphere has always been about the same as it is now.⁵

Mr. David A. Depew, of Alhambra, California, called this item to my attention.

Archaeopteryx not the First Bird

It has been reported that a fossil bird has been found which is claimed to be sixty million years earlier than the *Archaeopteryx*.⁶ Accordingly, it is stated: "... we must now look for the ancestors of flying birds in a period of time much older than that in which the *Archaeopteryx* lived."

Many Creationists will doubt the sixty million years. They can agree, however, that the *Archaeopteryx* was no connecting link between reptiles and birds. For there was no such connecting link at all; the kinds were created separate.

Is this not oddly like the situation about man: evidence has been found to show that true men were living before some of the alleged links lived?

The mastodon mentioned in the reference, incidentally, was noteworthy in that a stone point, evidently an artifact, was embedded in it. Thus it was contemporary with man.

References

- ¹Slusher, Harold S., 1971. Some astronomical evidences for a youthful Solar System. *Creation Research Society Quarterly* 8(1):55-57.
- ²Leinert, Christoph, 1975. Zodiacal light—a measure of the interplanetary environment. *Space Science Reviews* 18(3):281-333.
- ³Van Flandern, T. C., 1977. Evidence for a recent origin of comets and asteroids. *Bulletin of the American Physical Society* 22(4):538.
- ⁴Verschuur, Gerrit L., 1977. The Gaea hypothesis—our living planet. *Griffith Observer* 41(12):2-9. (Published by Griffith Observatory, Los Angeles.)
- ⁵Dimroth, Erich, and Michael M. Kimberly, 1976. Precambrian atmospheric oxygen: evidence in the sedimentary distribution of carbon, sulfur, uranium, and iron. *Canadian Journal of Earth Sciences* 13(9):1161-1185.
- ⁶1977. Bone bonanza: early bird and mastodon. *Science News* 112(13):198.

QUOTABLE QUOTE

"If here it be demanded what that is which keepeth nature in obedience to her own law, we must have recourse to that higher law whereof we have already spoken . . . all other laws do thereon depend . . . Although we are not of opinion . . . that nature in working hath before her certain exemplary drafts or patterns . . . nevertheless, forasmuch as the works of nature are no less exact, than if she did both behold and study how to express some absolute shape or mirror always present before her . . . it cannot be but nature hath some director of infinite knowledge to guide her in all her ways. Who the guide of nature, but only the God of nature? . . . Those things which nature is said to do, are by divine art performed, using nature as an instrument; nor is there any such art or knowledge divine in nature herself working, but in the Guide of nature's work.

Whereas therefore things natural which are not in the number of voluntary agents . . . do so necessarily observe their certain laws, that as long as they keep those forms which give them their being . . . all which they do in this sort proceedeth originally from some such agent, as knoweth, appointeth, holdeth up, and even actually frameth the same.

The manner of this divine efficacy, being far above us, we are no more able to conceive by our reason than creatures unreasonable by their senses are able to apprehend after what manner we dispose and order the course of our affairs."

—From Richard Hooker's "On the Laws of Ecclesiastical Polity", Book 1. This is contained in the reprinting of the first book by the University of Chicago Press.

BOOK REVIEWS

Astrology Disproved by Lawrence E. Jerome. 1977. Prometheus Books, Buffalo, New York 14215, 233 pp., \$14.95.

Reviewed by Gerardus D. Bouw*

This book does not qualify as creationist literature per se; but despite its great many flaws it does suggest a number of interesting and useful facts for the creationist.

Jerome is decidedly both an evolutionist and anti-Christian. He espouses these views so dogmatically that it can be seen to hurt his line of argument against the evils of astrology. Thus, for example, in the first chapter Jerome constructs an elaborate and purely speculative fantasy on the origin of language, folklore, myths, magic and astrology which is based on Marshack's speculations about the evolution of language.¹ Marshack bases his elaborations on a number of batons, decorated with figures and scratches and made of either stone or bone. If Marshack is right in his interpretation of these batons as calendars, then this provides evidence of an already developed, on-going *astronomy*, not astrology.

Jerome is sometimes quite careless in his presentation. For example, he correctly notes that astrology is based on magic, the suggestive power of words and analogies. He then traces its supposed Babylonian origins through the Greeks and notes that the Greeks obscured the magic base with their ideas of science and philosophy; but when Augustine condemned astrology and pointed to its thusly obscured base, Jerome writes that: "It required religion—in the form of Christianity and in the person of St. Augustine—to put the magic *back* into astrology." p. 97. Thus he would leave the reader to wonder which he meant, had the Greeks obscured the magic, as he first claimed, or had they removed it as would be indicated in the quote?

Likewise, on p. 106, Jerome takes a swipe at Luther for blaming "much of medieval Europe's ills upon the insidious work of witches" while he, himself, attributes many similar ills to those other "magicians", astrologers. This despite the fact that he has an even weaker base than he maintains that Luther had.

One example of the weakness of his base is his treatment of Kepler. He correctly credits Kepler with having more sense than to believe in astrology, but yet Jerome maintains that Kepler's belief in astrology delayed his formulation of the three laws by some 20 years. Actually, this delay was based more upon Kepler's acceptance of the Platonic idea of geometrical perfection than upon any astrological belief.

The weakness of the author's humanistic beliefs show up in other places, too. He is puzzled throughout by the persistent acceptance of astrology in the light of rationalism. Apparently he holds the commonly accepted myth that rationalism can explain or overcome any problem but, just as in mathematics where rational numbers cannot negate the irrational, this is clearly not

so. Thus he also does not notice the inverse relationship between Christianity and astrology, although he does admit to Augustine's influence against astrology. Instead, he points to scientific progress in the late Renaissance and the Enlightenment. In doing so, however, he fails to notice that these actually fit the Reformation and the Great Revivals much more closely since it takes at least one or two generations for any new idea or philosophy to take effect. His matching is contemporaneous, however.

Jerome also holds to Wedel's² belief that astrology and geocentricity are linked. There is no real evidence for this belief since it could just as well be claimed that geocentricity requires the earth to be motionless and therefore unaffected by the perturbations of the other bodies in the universe and, therefore, particularly unaffected astrologically. If Wedel's premise is true then Luther, an ardent defender of geocentricity, must have been a nut on astrology which he most definitely was not.

Despite these and many more flaws, some things could be said in favor of the book. Jerome does mention the fact that the astrologers no longer place the planets in their appropriate constellations. Because of the precession of the equinoxes, if the astrology column in the newspaper says that the sun was in Leo when someone was born, then he can rest assured that it was most likely in Cancer instead.

The fate versus free-will argument mentioned on pages 105-106 is particularly relevant to Christians who insist on following the stars. After all, if the planets and stars control our destinies then God has nothing to say in the matter.

The discussion on disasters is also quite strong. Drawing up the charts for all the victims of a disaster could reveal that not a single one was to have died anywhere near that particular date.

Perhaps the strongest point to be made against astrology is its application in mind-control. Astrologers ruled Rome for several centuries during which it started its inexorable decline and fall, albeit not total annihilation.

Finally Jerome makes much of the "principle of correspondence", the foundation of astrology and magic. The reasoning is simple: "as above, so below". He fails to perceive, however, that modern science has turned this around into the equally absurd "as below, so above". This is especially true of the list of alternatives to astrology which he lists on page 200.

This book is not likely to strengthen one's faith, nor, for that matter, does the author come across credibly because of many such self-contradictions as mentioned above. One noteworthy thing in the book is this: it is mentioned that astrology appeared virtually simultaneously over all of the world. That, of course, would fit in with the Noachian flood and subsequent dispersion.

ON QUOTATION AND CONTEXT

Creationists are often able to find valuable ammunition in controversy with the evolutionists by quoting the admissions of the evolutionists themselves. Sometimes,

*Gerardus D. Bouw, Ph.D., is with the Department of Computing and Information Science, Cleveland State University, Cleveland, Ohio 44115.

upon so doing, the Creationists are accused of quoting out of context. It may be of some interest, then, to examine this matter of context.

Nobody denies, of course, that some context is needed. Dr. Henry Morris often says: "A text without a context is a pretext". Usually quotation out of context, whether alleged or real, means in fact giving too small a context, as the following example (whether true or not) will show.

There was once a style in ladies' hairdressing called the top knot, which a certain minister detested. So, one Sunday, he announced as his text: "Top knot, come down!" Upon being challenged to show that in the Scripture he pointed out that it is found in St. Matthew 24:17,—provided one start reading at the word after "house"!

Clearly, that was a case of too small a context. But how much context is needed, in general? It is not possible to give all of an author's works, or even all of one book, as a context for one sentence.

In fact, though, there is really no problem, is there? Sufficient context is that which is sufficient for an unprejudiced man of ordinary intelligence, of the kind assumed on a jury, for instance, to grasp the ordinary meaning of the quotation. And in practice such men would rarely differ much as to the context needed, or the meaning.

In fact, the reason why the evolutionists raise objec-

tions is often that an author will admit certain reasons why evolution could never have happened, but then will go on to say that it did happen anyway. The evolutionists want to have the going on as the context.

In such cases an author would be giving different testimony in different places. Here again the example of a jury may be useful. What does a juror do when he hears conflicting testimony? He tries to decide which is more reliable. And testimony which is not in the interest of the witness, or is even against it, is surely more reliable. For men do not lie in order to go contrary to their own interest.

Well, then, an author, say an evolutionist, has given conflicting testimony. He seems to consider it to be in his interest that evolution be true. So, by the principle just established, it is his testimony against evolution, by admitting the difficulties or impossibilities, which is more reliable. The Creationist, then, is doing the reasonable thing in quoting those parts.

Again, an author's statement, about say a difficulty in the theory of evolution, is either true or false, no matter what he said elsewhere. If it is true, a Creationist is not at fault in using it as evidence. If it is false, it is the author who is to blame, not the man who quotes it in good faith.

So it is seen, then, that the accusation of quoting out of context, sometimes brought against Creationists, is not, in general, a reasonable one.

LETTERS TO THE EDITOR

Student Research Organization

The readers of the Quarterly might be interested to know of the formation of "Students for Origins Research" (SOR), an inter-campus organization whose main purpose is to help college students and instructors study the evolution-creation issue.

The recent debates concerning scientific views of origins held on many university campuses, have prompted students to evaluate the evidence for themselves. As a result, students have been forming campus clubs at various schools. In 1974 several science students started the first such group at the Santa Barbara campus of the University of California known as the Creation Society of Santa Barbara. Since then a group called the Evolution Inquiry Association was started in at UCLA by a pre-med student, and a Creation Research Society student chapter was formed at the University of Texas, El Paso. We are continually receiving requests from students to help initiate similar groups at their school. Since very little effort is being made by school administrators or professors to present a balanced view of origins, students are being motivated to take the initiative.

Presently, however, there is no communication between these independent groups and with constant student turnover it is hard to keep these groups going once they are started. We feel that the formation of SOR will solve some of these problems, and encourage even more students to participate.

Among the present goals of SOR are:

- prepare a packet of material that will help students form an origins research group on their campus.
- help students plan lectures and debates, and provide them with information concerning creation scientists that are willing to speak at universities.
- provide reference materials for students who would like to do a term paper on origin topics and would like to include the creationist viewpoint.
- publish a newsletter that would:
 - report news on student events.
 - provide a means for students to have their research papers published.
 - provide a cost-effective means to present to skeptical or uninformed students and professors, sound scientific evidence for creation.

The first issue of the newsletter was published in February of this year and we hope to put it out every two months depending on available finances and student research papers. The newsletter will be sent free of charge to all students and faculty requesting it and will be available at a \$2.00 annual subscription rate to all other interested persons.

Currently SOR is staffed by a few part-time volunteers and financed by donations from individuals and special interest groups such as the Bible-Science Association. We feel the potential of such an organization far exceeds our present resources and we therefore

seek the help of everyone who shares our vision. You can help by:

- sending us the names of students and professors that would be interested in establishing a student group on their campus.
- encouraging subscriptions to the newsletter ORIGINS RESEARCH
- ordering bulk quantities of the newsletter to distribute on local campuses.
- sending us information and photographs of student groups or origins related lectures on local campuses.
- submitting student research papers for the newsletter. These papers should be typed and double spaced if possible. The papers should be 2000-4000 words in length. It should be remembered that the target readership for this newsletter is public schools and this should be kept in mind for all papers submitted.

We hope that SOR will not be in competition with any existing creation group or publication, but rather serve to unify the efforts of the many different organizations to meet the needs of college and university students. We pray that the continued work in the field of science and creation will allow students to realize that creation is a viable alternative world view and scientific model, and will ultimately lead them to establish a personal relationship with the Creator.

Dennis Wagner
Students for Origins Research
P. O. Box 203
Goleta, California 93017
Received February 19, 1978

Further Comment on Skull 1470

I was pleased to see that my own article on Skull 1470 was followed by one by John W. Cuozzo, D.D.S., in which he suggested an opposing view.¹ Dialogue that should be generated by the articles should prove fruitful. It is in that spirit that my remarks on Dr. Cuozzo's article are offered.

The nasal aperture. Dr. Cuozzo states correctly that "the nasal aperture of the gorilla is commonly a wide one while the narrow and more piriform shape is found in *Homo sapiens*". My thesis is that 1470 could very well be an australopithecine. The nasal opening in *Australopithecus* is piriform.² I seriously question whether 1470 had the developed anterior nasal spine ("ans") that is assumed by Dr. Cuozzo. My own photographs reveal that the surviving malar surface of the maxilla bordering the piriform aperture is rather *sunken or depressed* as in the australopithecines. The area does not round outwardly to meet at the base of the midline of the aperture where, in humans, the projection of the anterior nasal spine rises. At best the evidence is inconclusive.

Prognathism. The maxillary and mandibular procumbencies have to be seen on the *whole face* which does project forward to a remarkable degree.³ The reconstruction, in contrast to earlier, more vertical ones, supports the contention that we are dealing with a

possible australopithecine and not a remarkably facially prognathous human.

Loss of teeth and damage to the anterior nasal spine. Dr. Cuozzo correctly suggests that the missing teeth of the maxilla were lost after death. I fail to see, however, any necessary connection between the loss of the teeth and the destruction of the anterior nasal spine (assuming a human-like one was present). In the post mortem period teeth may simply fall out of the alveoli when a skull is moved or picked up. I have observed this during archaeological investigations. The skulls we found had suffered no traumatic conditions other than being carefully excavated. Leakey says the skull was "shattered".⁴ The teeth may or may not have fallen out before the shattering. The anterior nasal spine may or may not have been damaged before the shattering.

Since some potentially diagnostic bone is missing from the skull, and since the other evidence is quite controversial, I do not agree with Dr. Cuozzo's statement that "a normal human nose can be reconstructed with confidence".

Cranial features. The occipital area is rather gracile, but that is also true of *Australopithecus africanus*. The presence or absence of a nuchal crest for the attachment of heavy neck muscles is non-diagnostic taken by itself. Some members of true genus *Homo* display a nuchal crest, some do not.

Taken into consideration with other *africanus* characteristics the postorbital waisting evident on Skull 1470 is significant.⁵

Other considerations. In my own paper I referred to studies by Alan Walker who had some strong reservations about assigning the skull to genus *Homo* (171). In an article that appeared about the same time I submitted my own for publication Elwyn L. Simons also expressed some doubt about *Homo* status for 1470 and remarked about the australopithecine characteristics of the skull:

The earliest fossils of *Homo* from Africa such as E. R. 1470, if indeed they should be designated *Homo*, show a facial and cranial modeling that is quite reminiscent of *Australopithecus*.⁶

In spite of the recent appearance of Richard Leakey's award winning book² it must be made emphatically clear that evolutionary anthropology is far from presenting a united front on the question of the taxonomic status of 1470 and other East African hominids. The following quote from an unsigned article in *Nature* should serve to illustrate:

... one of the more serious problems in studies of early man today. That problem is a lack of usable and valid definitions for genera within the family *Hominidae*.

... its (1470) position within *Homo* is clearly now uncertain.⁷

I still want to urge utmost caution in assigning KNM-ER 1470, as well as the Laetolil (Mary Leakey) and Hadar (Donald Carl Johanson) fossils to genus *Homo*. My own very strong inclinations are that these fossils belong either to *Australopithecus* or to a yet-to-be-named genus of extinct creatures who are not related to man.

(Continued on next page)

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 500 voting members (with graduate degrees in science) and over 1600 non-voting members. The *Creation Research Society Quarterly* has been gradually enlarged and improved and now is recognized as probably the outstanding publication in the field.

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

Membership Voting membership is limited to scientists having at least an earned graduate degree in a natural or applied science. Dues are \$10.00 (Foreign, \$11.00 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 \$10.00 (Foreign, \$11.00 U.S.) per year and includes subscription to the Annual Issue and Quarterlies. All others interested in receiving copies of all these publications may do so at the rate of the subscription price for all issues for one year: \$13.00 (Foreign, \$14.00 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. Subsequently a Revised Edition (1974), a Teachers' Guide and both Teachers' and Students' Laboratory Manuals have been published by Zondervan Publishing House. All members of the Society subscribe to the following statement of belief:

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

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

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

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

Board of Directors *Biochemistry*: Duane T. Gish, Ph.D., Institute for Creation Research, 2716 Madison Avenue, San Diego, CA 92116. *Biological Sciences*: Wayne Frair, Ph.D., Secretary, The King's College, Briarcliff Manor, NY 10510; George F. Howe, Ph.D., President, Los Angeles Baptist College, Newhall, CA 91321; John R. Meyer, Ph.D., University of Louisville, KY 40208; Wilbert H. Rusch, Sr., M.S., LL.D., Membership Secretary, Academic Dean, Concordia College, Ann Arbor, MI 48105. *Engineering*: D.R. Boylan, Dean, College of Engineering, Iowa State University, Ames, Iowa 50011; *Genetics*: John W. Klotz, Ph.D., Academic Dean, Concordia Seminary, St. Louis, MO 63105; Walter E. Lammerts, Ph.D., Freedom, CA 95019; William J. Tinkle, Ph.D., Timbercrest Home, North Manchester, IN 46962. *Geology*: Clifford L. Burdick, M.S., D.Sc., 924 N. 6th Avenue, Tucson, AZ 85705. *Geophysics*: Harold Slusher, M.S., D.Sc., University of Texas at El Paso, TX 79902. *Physical Sciences*: Harold Armstrong, M.S., Publications Editor, Queens University, Kingston, Ontario, Canada; Thomas G. Barnes, D.Sc., University of Texas at El Paso and Consultant to Globe Universal Sciences, Inc., El Paso, TX 79902; Richard G. Korthals, M.S., Treasurer, Dean, Concordia Teachers College, River Forest, IL 60305; Henry M. Morris, Ph.D., Institute for Creation Research, 2716 Madison Avenue, San Diego, CA 92116; George Mulfinger, M.S., Bob Jones University, Greenville, SC 29614; Emmett L. Williams, Jr., Ph.D., Vice-President, Bob Jones University, Greenville, SC 29614. *Science Education*: John N. Moore, M.S., Ed.D., 136 Brody Hall, Michigan State University, East Lansing, MI 48824.

SPECIAL REPRINT AVAILABLE

Some Christians believe that Charles Darwin, toward the close of his life, repudiated evolution and became enthusiastic for Christianity. That this did not occur has been reported by Dr. Wilbert H. Rusch, Sr., in a 1975 investigative paper on what Darwin wrote, and presumably believed, in the last two years of his life.

Now a special reprint of that paper "Darwin's Last Hours" is available for twenty-five cents (\$0.25)/postpaid per copy from the College Bookstore of Concordia College, 4090 Geddes Road, Ann Arbor, Michigan 48105. This will be a fine publication to give to those people who inquire about a possible Christian conversion of Darwin.

LETTERS TO THE EDITOR

(Continued from page 126)

References

- ¹Cuozzo, John W., 1977. Skull 1470—a new look. *Creation Research Society Quarterly* 14(3):173-176.
²Day, M. H., 1975. The fossil history of man. Oxford biology reader 32. Oxford University Press. P. 8.
³Leakey, Richard E., and Roger Lewin, 1977. Origins. E. P. Dutton, New York. P. 86.
⁴Ibid.

⁵Leakey, Richard E., 1976. Hominids in Africa. *American Scientist* 64(2):174-178. See especially page 175.

⁶Simons, Elwyn L., 1977. Ramapithecus. *Scientific American* 236(5):28-35.

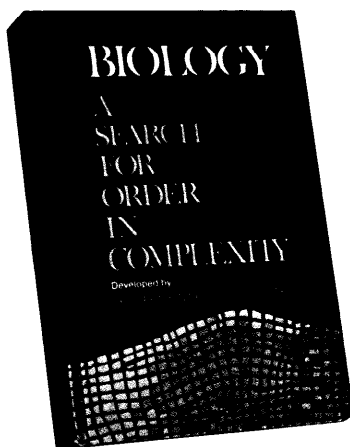
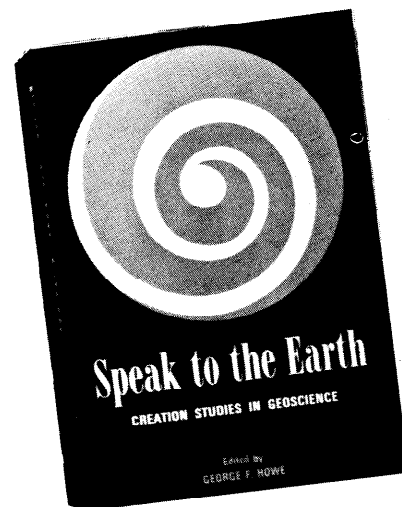
⁷1976. Rethinking human evolution. *Nature* 264(5586):507-508.

Cordially,
Chris C. Hummer
1211 Rose Lane
Berwyn, Pennsylvania 19312
Received February 10, 1978

SPEAK TO THE EARTH (*Creation Studies in Geoscience*)

A classified anthology of articles from *Creation Research Society Quarterly* for second five-year period, 1969-1974.

Presbyterian and Reformed Publishing Company, Nutley, New Jersey. \$12.50.



BIOLOGY: A SEARCH FOR ORDER IN COMPLEXITY (Revised Edition, 1974)

A textbook for high school presenting creation AND evolution.
595 pp., 436 illustrations, \$9.95.

TEACHER'S GUIDE TO ACCOMPANY BIOLOGY: A SEARCH FOR ORDER IN COMPLEXITY

Paperback, \$1.95.

INVESTIGATIONS INTO BIOLOGY: STUDENT'S LABORATORY MANUAL

Paperback, \$1.95.

INVESTIGATIONS INTO BIOLOGY: TEACHER'S LABORATORY MANUAL

Paperback, \$1.95.

WHY NOT CREATION?

A classified anthology of articles from *Creation Research Society Quarterly* for the first five-year period, 1964-1969.

Baker Book House, Grand Rapids, Michigan and Presbyterian and Reformed Publishing Company, Nutley, New Jersey. \$7.50.

SCIENTIFIC STUDIES IN SPECIAL CREATION

Additional articles from *Creation Research Society Quarterly*, 1964-1969.

Baker Book House, Grand Rapids, Michigan and Presbyterian and Reformed Publishing Company, Nutley, New Jersey. \$6.95.

SPECIAL REPRINT AVAILABLE

The primary purpose of the Creation Research Society is to carry out, or to encourage, Creationist research in the natural sciences, and to publish the results of such research. In an article in the June, 1975 issue of the *Creation Research Society Quarterly*, Dr. Duane T. Gish published a summary report of Creationist research in the last decade.

His report was organized under these headings: Geology, General Geological Reports, Genetics, Natural Selection, General Biology, Taxonomy, Thermodynamics, and A Research Challenge.

So that members of the Creation Research Society and other interested persons might distribute this summary of a decade of Creationist research a special reprint of the Gish article has been made available. The 16-page reprint is priced at 75 cents per copy, with price reduced to 50 cents each for orders of 100 copies. Orders for the reprint may be placed through the College Bookstore of Concordia College, 4090 Geddes Road, Ann Arbor, MI 48105. Postage will be paid by the bookstore.