SIGNIFICANT FOSSIL DISCOVERIES SINCE 1958: CREATIONISM CONFIRMED†

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Creationists have often pointed out that the fossil record, although claimed by some to be evidence for evolution, is in fact more indicative of special Creation. A well known book on geology, published in 1958, corroborated, in a remarkable chart, the Creationist position, although the book was not written from a Creationistic viewpoint.[1] It showed that many distinct kinds of creature, both plant and animal, appeared suddenly and separately in the fossil record, and remained separate, without any evidence of evolution into something else, until the present or until they became extinct. In this article some of this evidence is reviewed. Also, it is shown that in the years since 1958 the beginning of various kinds has been found to be earlier in the fossil record, but there is still no evidence that some evolved from others.

Although many different kinds of evidence are cited to support evolutionary theory, all of these evidences are circumstantial with the exception of the historical evidence, the fossils. Many evolutionists recognize that the theory of evolution stands or falls ultimately on the quality of the fossil evidence. Yet, there is something of a paradox in the almost universal acceptance of evolution on the one hand and the universal absence in the fossil record of the transitional forms which the theory of evolution demands.

For generations, we have been exposed to diagrams of the so-called tree of life implying that all life is genetically related and began with one or a few simple cells. Seldom in evolutionary writings are we shown diagrams setting forth the true condition of the fossil record. Perhaps the most complete and most remarkable statement of the actual condition of the fossil record is the chart, reproduced in the paper, from the inside front cover of *Introduction to Historical Geology*, Second Edition, by Raymond C. Moore,[1] published in 1958. Moore, before his death in 1974, was professor of Geology at the University of Kansas. He was the editor of the definitive six-volume work, *Treatise on Invertebrate Paleontology*, and was one of the most distinguished of twentieth-century paleontologists.

Even a cursory examination of Moore's chart reveals the following facts regarding the fossil record: first, the separateness or distinctiveness of all eighty-six categories of plants and animals from the time of their first appearance in the fossil record to the present day (or to the time of their extinction); second, the complete and total absence of transitional forms between the various categories listed in the chart; and third, the alleged evolutionary relationships inserted in dotted lines which reveals that these relationships are a faith construct or a philosophical concept rather than a deduction from the fossil evidence.

Since Moore's chart represents the evidence for the condition of the fossil record in 1958, it is the purpose of this paper to set forth the most significant fossil discoveries in the twenty-two years since 1958, as reported in the relevant literature, to determine whether this separateness of the categories of plant and animal life persists—thus strengthening the evidence for special creation—or if convergence through the discovery of transitional forms has been demonstrated—thus furnishing a degree of rigorous historical evidence for evolution. The material will be considered under four categories: Precambrian Microfossils, Land Plants, Invertebrates, and Vertebrates.

I. The Precambrian Microfossils

Although the study of the Precambrian microfossils is less than fifteen years old, it has already given rise to an extensive literature. Rather than deal with this literature here, I want merely to state some of the questions Creationists have regarding the interpretation of these microfossils and the reasons why we challenge this interpretation.

Several years ago, I attended a seminar on the Precambrian microfossils at the University of Michigan, Ann Arbor. The speaker was Dr. J. William Schopf (Professor of Geology, U.C.L.A.), who is recognized as perhaps the world's leading authority on the Precambrian biota. Questioned why people haven't looked much for fossils in the Precambrian (which evolutionists feel represents seven-eighths of earth history), Schopf replied that they had looked but had looked for the wrong things. They made the mistake of looking for large (megascopic) organisms. He continued:

> Of course, the Precambrian really is the age of microscopic life. Many of us working in this field figure that you can look as long and as hard as you want in rocks perhaps older than 700 million years and you never will find any megascopic records of life. Many of us think that there were no such things as megascopic organisms prior to that time.[2]

Schopf thus rules out, by definition or by belief, any possibility of discovering anything but microscopic life in the bulk of the Precambrian. However, after commenting on some of the spurious Nineteenth Century claims of macroscopic fossils in the Precambrian, he remarks:

> In a philosophical sense, folks find what they want to find. You go out looking for something . . . and some folks will make it be whatever their model says it should be. That type of thing, unfortunately, runs through science.[2]

In the question period following his lecture, I asked

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Schopf two questions. I first asked him what criteria were used to determine whether a given object in the Precambrian was indeed a microfossil as opposed to something of inorganic origin. Calling it "an interesting problem," he said that one had to determine that a particular object was indigeous to the rocks involved, and then determine whether it was indeed a fossil. His criteria were, first, "Was is of organic composition?" and second, "Does it have biologic morphology?" His criteria worked quite well, he felt, for something relatively complex. However, "the spheroids become a mess." For these are smaller, and in the earlier assemblages, most of them are very poorly preserved. He thus cited two additional criteria: first, "Are such spheroids a part of an evolutionary continuum? Do they fit in?" He stated that some do but most do not. Second, an examination of population structure is useful. When compared to the organic matter in meteorites—which is non-biological—most of the spheroids compare with them rather than with biological systems.

My second question dealt with two articles published in the journal, *Evolution*, by Daniel Axelrod (1959) and S. Leclercq (1956). Both cited numerous fossil discoveries of vascular (land) plants in the Cambrian. Reference will be made to both of these articles later. I asked Schopf if he were familiar with those papers—knowing that he was an associate of Axelrod at U.C.L.A. He replied:

> Oh yes, and I think that even Dan (Axelrod) would say these days that that is an error . . . If you find a tracheid in there (Precambrian shale on which one is doing macerations), you say "I have a Precambrian tracheid," particularly if that happens to fit your model that there ought to be vascular plants in the Precambrian . . . The nice thing now is that you have a tree, a tree of some sort (based on the evolutionary sequence of Precambrian microfossils that he and others have worked out). You know what is reasonable and what isn't reasonable. There is some base data. You have some idea of what we've found in these sections, demonstrably indigenous to the Precambrian. Now we can go look (at other rocks) and if somebody finds pine pollen, as has been reported in the Precambrian (much laughter by the audience) they are not going to interpret it, one hopes, unless they are anti-evolutionists, as evidence for pine in the Precambrian. So now we have some sort of base line. That base line is not fixed. We have many questions to solve. We don't know all the answers. There's an awful lot more to learn than we already know now, but I think we are making some progress.[2]

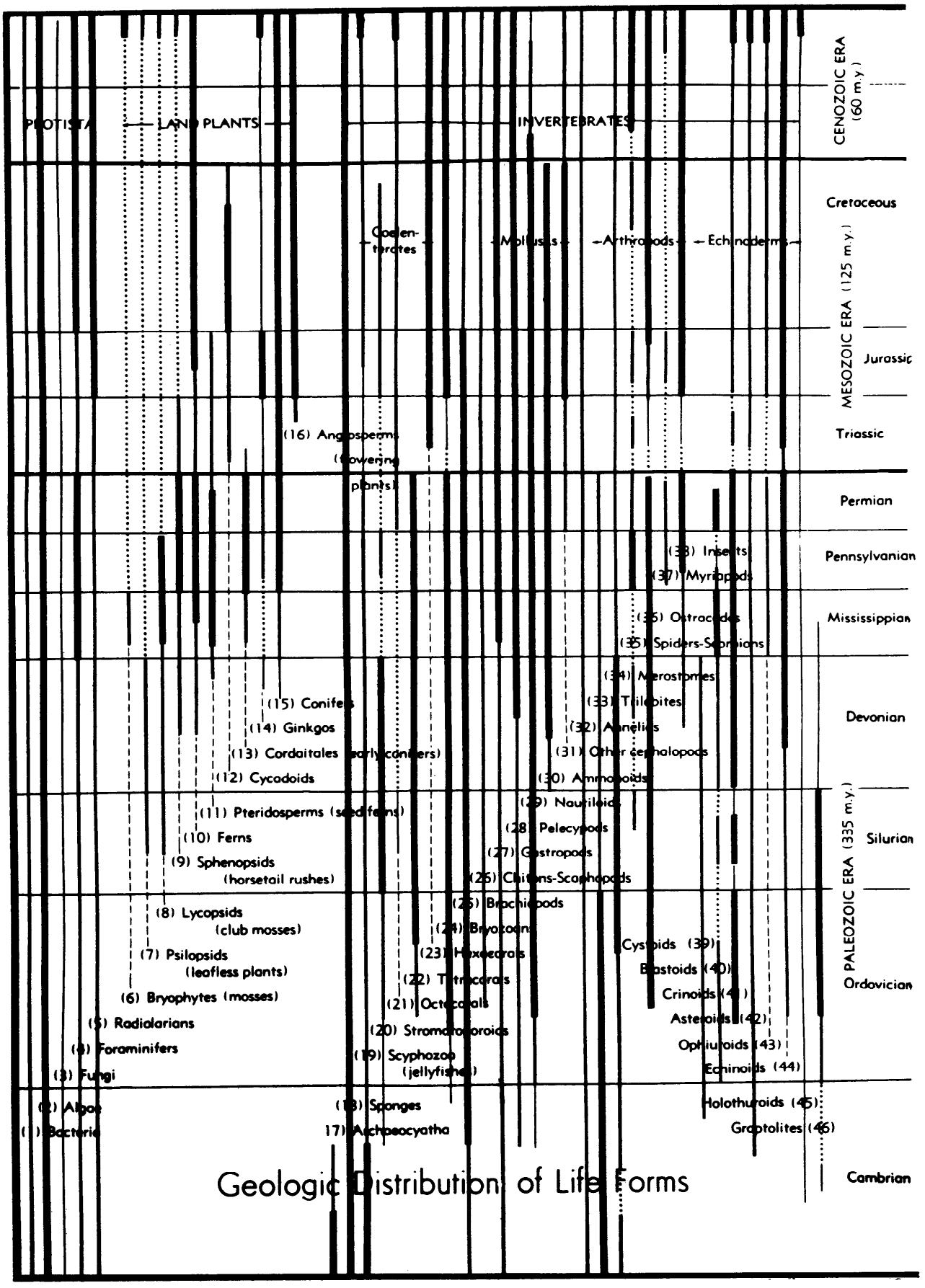
I have no doubt, based upon the evidence Schopf presented, that he has indeed found legitimate microfossils—including fossils of multicellular organisms—in the Precambrian. The reason I am convinced he has found multicellular fossils in the Precambrian is itself interesting—they are virtually identical with present-day organisms. His work in this case is with blue-green algae preserved in stromatolite sediments. Blue-green algae from stromatolite material said to be 900 million years old were easily identified by their present-day morphological counterparts. Schopf spoke of " . . . their apparent lack of morphological evolution. To evolutionists this presents a rather interesting problem." Further this lack of change in both the unicellular and multicellular fossils was " . . . characteristic of these primitive microorganisms."

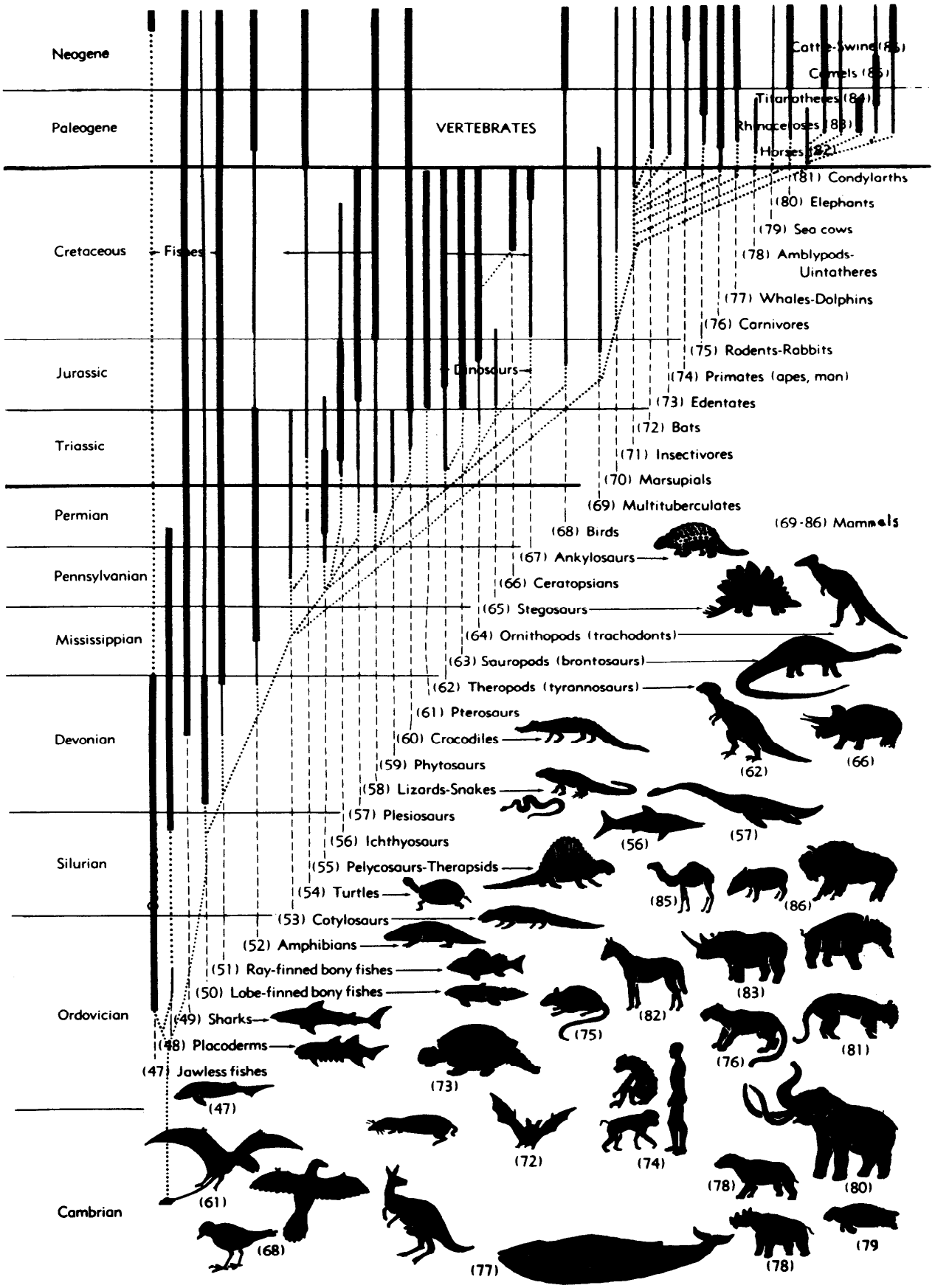
Creationists have no difficulty accepting the legitimacy of these Precambrian fossils. We do have immense difficulty in accepting the age which evolutionists assign to them. (The dating methods are beyond the scope of this paper but have been handled very well in other creationist writings.) "Change" and "evolution" are used almost synonymously. The evolutionist's

Table 1. This shows extensions which should be made to many of the lines in the chart, on the basis of discoveries of fossils since the chart was first prepared.

Line no.	Fossil	Extended to
6	Bryophytes	Lower Cambrian
7	Psilopsids	Lower Cambrian
8	Lycopsids	Middle Cambrian
9	Sphenopsids	Lower Cambrian
10	Ferns	Lower Cambrian
11	Pteridosperms	Middle Cambrian
12	Conifers	Bottom of Cambrian
16	Angiosperms	Bottom of Cambrian
22	Tetracorals	Middle Cambrian
24	Bryozoons	Bottom of Ordovician
26	Chitons-Scophopods	Bottom of Cambrian
28	Pelecypods	Lower Cambrian
31	Other Cephalopods	Bottom of Cambrian
36	Ostracades	Bottom of Cambrian
37	Myriopods	Middle Silurian
38	Insects	Lower Cambrian
41	Crinoids	Middle Cambrian
43	Ophiuroids	Lower Ordovician
44	Echinoids	Lower Cambrian
47	Jawless fishes	Middle Cambrian
49	Sharks	Upper Ordovician
58	Lizards, Snakes	Upper Pennsylvanian
69	Multi-tuberculates	Upper Triassic
74	Primates	Middle Cambrian
81	Condylarths	Upper Cretaceous

The Chart, on the next two pages (the two parts may be imagined pushed together to form one chart) shows the state of the fossil record in 1958, when the chart was published. Some later discoveries, listed in Table 1, serve to extend a number of the lines. It will be noticed that there is no recorded branching of lines or evolution of one kind into another; if anything of the sort is suggested it is hypothetical.


PROTISTA
LAND PLANTS
INVERTEBRATES
CENOZOIC ERA (60 m.y.)
Cretaceous
Coelenterates
Molluscs
Arthropods
Echinoderms
MESOZOIC ERA (125 m.y.)
Jurassic
Triassic
(16) Angiosperms (flowering plants)
Permian
(38) Insects
(37) Myriapods
Pennsylvanian
(36) Ostracodes
(35) Spiders-Scorpions
Mississippian
(34) Merostomes
(33) Trilobites
(32) Annelids
(31) Other cephalopods
(30) Ammonoids
(15) Conifers
(14) Ginkgos
(13) Cordaitales (early conifers)
(12) Cycadoids
Devonian
(29) Nautiloids
(11) Pteridosperms (seed ferns)
(28) Pelecypods
(10) Ferns
(27) Gastropods
(9) Sphenopsids (horsetail rushes)
(26) Chitons-Scaphopods
(25) Brachiopods
(8) Lycopsids (club mosses)
(24) Bryozoans
Cystoids (39)
(7) Psilopsids (leafless plants)
(23) Hexacorals
Blastoids (40)
(22) Tetracorals
Crinoids (41)
(6) Bryophytes (mosses)
(21) Octocorals
Asteroids (42)
(5) Radiolarians
(20) Stromatoporoids
Ophiuroids (43)
(4) Foraminifers
(19) Scyphozoa (jellyfishes)
Echinoids (44)
(3) Fungi
Silurian
PALEOZOIC ERA (335 m.y.)
Ordovician
(2) Algae
(18) Sponges
Holothuroids (45)
(1) Bacteria
(17) Archaeocyatha
Graptolites (46)
Cambrian
Geologic Distribution of Life Forms


Neogene
Paleogene
Cretaceous
Jurassic
Triassic
Permian
Pennsylvanian
Mississippian
Devonian
Silurian
Ordovician
Cambrian
VERTEBRATES
Fishes
Dinosaurs
Cattle-Swine (85)
Camels (85)
Titanotheres (84)
Rhinoceroses (83)
Horses (82)
(81) Condylarths
(80) Elephants
(79) Sea cows
(78) Amblypods-Uintatheres
(77) Whales-Dolphins
(76) Carnivores
(75) Rodents-Rabbits
(74) Primates (apes, man)
(73) Edentates
(72) Bats
(71) Insectivores
(70) Marsupials
(69) Multituberculates
(69-86) Mammals
(68) Birds
(67) Ankylosaurs
(66) Ceratopsians
(65) Stegosaurs
(64) Ornithopods (trachodonts)
(63) Sauropods (brontosaurs)
(62) Theropods (tyrannosaurs)
(61) Pterosaurs
(60) Crocodiles
(59) Phytosaurs
(58) Lizards-Snakes
(57) Plesiosaurs
(56) Ichthyosaurs
(55) Pelycosaurs-Therapsids
(54) Turtles
(53) Cotylosaurs
(52) Amphibians
(51) Ray-finned bony fishes
(50) Lobe-finned bony fishes
(49) Sharks
(48) Placoderms
(47) Jawless fishes

favorite, although sadly deficient and misleading, definition of evolution is "change through time." To state that these Precambrian microorganisms have persisted through 900 million years of evolutionary history with no change whatsoever stretches credulity. Many creationists believe that evolutionists are in error in their dating system by a factor of 10^5.

I have referred as extensively as I have to Schopf's work with the Precambrian microfossils because that same lack of objectivity so clearly seen in his evaluation of the Precambrian fossils is also seen in the failure of evolutionists to accept the extensive evidence found in the literature for land plants in the Cambrian. It will be noted in Schopf's criteria that there is first of all the assumption that evolution is a fact. Hence, Precambrian fossils are accepted as valid only when they fit into an evolutionary continuum. Any evidence for creation is automatically discarded as contamination, no matter how valid that evidence might be. Only evidence that fits the evolutionary scenario is valid. It is not at all surprising, then, that Schopf and others are able to point to their research as supportive of evolution. One can only wonder at the amount of contrary evidence that has gone unreported. The theory of evolution thus determines which evidence will be accepted and which evidence will be discarded. This same prejudice obtains when we consider the evidence for vascular plants in the Cambrian.

II Discoveries of Fossils of Land Plants

It is the almost universal evolutionary position that vascular (land) plants evolved from marine plants called algae. These algae are thought to have evolved in the Precambrian. Later, in the Cambrian, some of the modern algae groups were established, and in the Ordovician the marine algae were the dominant plant types. One could document literally thousands of statements in evolutionary literature stating that land plants did not evolve until the late Silurian and early Devonian, and that this is where the first direct fossil evidence for land plants is found. The time span from the first appearance of multicellular blue-green algae in the Precambrian to the appearance of land plants in the late Silurian is, according to evolutionists, approximately 500 million years.

Few people, other than botanists, appreciate the radical differences between marine and land plants, and the tremendous changes that had to take place before plants could survive on land—assuming that they evolved. Only when we understand the radical transformations that had to take place can we understand why the theory of evolution demands a vast period of time for the emergence of the land plants and why evolutionists resist accepting any evidence for land plants before the Silurian.

Aquatic plants do not need to support themselves nor have a deep root system, for the water itself gives them support and buoyancy. Their immediate environment provides them both with water for photosynthesis and the various mineral salts required. Further, they do not need a vascular system to conduct the water and minerals from the roots to the leaves because the necessary water and minerals can be absorbed directly from the environment. The water also provides the vehicle whereby the zoospores are dispersed and the sperm reaches the egg. Nor is there any danger of the plants drying out, for they are bathed in water.

For plants to survive on land, they had to "solve" all of these problems in the course of their evolution. One of the first and immediate necessities was the evolving of the cuticle, the wax-like layer which prevents a plant from drying out. Since a plant could dry out in just hours, this had to be a very rapid development. Yet, we are told that evolution is such a slow process that it is not subject to direct human observation. While a plant is in water, this cuticle would have been a disadvantage. Yet, a land plant needs it immediately. One looks in vain in evolutionary literature for an explanation as to how this transformation might have been accomplished.

Aquatic plants are quite fragile. The transformation to land involved an adequate root system for underground support as well as the evolution of the xylem, the tissue which gives above-ground support and rigidity to the plant.

This xylem also serves as the conducting or vascular system for the transport of water and mineral salts from the roots to the area of photosynthesis—the leaves. This vascular system is so basic to land plants that land plants are called vascular plants. This system is also diagnostic in determining whether a plant fossil is indeed a land plant. Chaloner writes:[3]

> The one criterion by which a fossil may be indisputably recognized as a vascular plant is by the occurence of xylem elements in the form of tracheids, with the characteristic thickening of the walls of this type of cell.

The land plants also had to develop a dispersal system for disseminating their reproductive cells. Since water was originally required for the sperm to swim to the egg, it is difficult to comprehend how a pollen system allowing transport by wind, insects, or animals could evolve rapidly enough to allow land plants to survive.

Further, the roots, once needed only to secure the plant to the bottom of its aqueous environment, not only had to be considerably extended for the support of the plant on land, but also had to take up a whole new function—that of mining or extracting mineral salts from the soil as well as transporting them to the above-ground portions of the plant.

When the radical nature of the changes is comprehended, it is easy to understand why evolution, with its belief that all of these changes came about naturalistically, demands vast periods of time. Yet, logic alone would seem to dictate that if land plants came from marine plants, each of these changes had to come about very rapidly and that most of them had to happen simultaneously for the land plants to survive.

Let us now consider some of the fossils.

A. *Division Bryophyta* (Line 6 on Moore's chart).

The bryophytes are the liverworts, the hornworts, and the mosses. After the Protista, they come first in the fossil chart by Moore because they are considered the most "primitive" green land plants and are thought to be something of a bridge or transition between the marine algae and the more "advanced" land plants.

Although they are extant today, Moore (1958) shows them as fossils only in the Mississippian. Scagel et al. 1969 (Ref. 4, pp. 250-51) show them in the Upper Devonian, Permian, and Triassic as well.

However, in 1959, Axelrod (Ref. 5, p. 264) cites the discovery by Naumova, in 1949, of Bryophyte spores in the Lower Cambrian Pre-Baltic clays of the U.S.S.R.

It should be pointed out that although this paper deals basically with fossil discoveries since 1958, we are going to include significant fossil discoveries made before that time and reported in the relevant literature but which have been ignored by Moore and others because they do not fit the accepted evolutionary scenario. One of the very few references in current botany textbooks to some of the discoveries we shall mention is found in Scagel et al. (Ref. 4, p. 25) who writes:

> Spores attributed to terrestrial plants have been found in Precambrian and Cambrian rocks in the Baltic. Whether some of these are from bryophytes is uncertain.

In the original report by Naumova, she stated that the spores represented both Bryophyta and Pteridophyta (Ref. 5, p. 264). Scagel et al. do not seem to challenge the fact that spores of land plants have been found in the Precambrian and the Cambrian. They only question whether they include bryophytes. Yet, this discovery of early terrestrial plants does not influence them in their concept of evolution or in their concept of the origin of land plants. They continue to state in their text that land plants first evolved in the Early Devonian.

B. *Division Psilophyta* (Line 7).

The psilopsids are the leafless plants. Besides being extant, they are shown by Moore to be found as fossils in the Silurian and the Devonian. Recent textbooks convey basically the same information.

However, Axelrod (1959, Ref. 5, p. 273) shows spores of *Rhyniaceae* (Division Psilophyta) having been discovered in the Lower Cambrian. He writes (p. 274): "The Psilophyte Paleoflora was already in existence in Precambrian time."

C. *Division Lycophyta* (Line 8).

The lycopsids are the club mosses. Some are extant; also many of the coal beds of the world are made up of extinct members of this group. Moore shows them as fossils from the Silurian to the Pennsylvanian. Recent texts date them no earlier.

In 1972, Fleming and Rigby[6] make reference to the discovery, in 1968, by J. Obrhel, of lycopod-like plant remains in the Ordovician of Bohemia. It should be understood that the discovery of fossil plant remains is even more significant than is the discovery of fossil pollen and spores as far as diagnosis and confirmation of land plants is concerned.

In 1956, Leclercq[7] records the discovery, by the Soviet investigator, A. N. Kryschtofowitch, in 1953, of lycopodiaceous plant material in the Middle Cambrian of East Siberia. The find included four impressions of shoots, one of which is 8.5 cm. long with spirally arranged microphyllous leaves. The 1959 article by Axelrod[5] refers to the article by Leclercq.

D. *Division Arthrophyta* (Line 9).

This division includes the sphenopsides and the Equisetales, the horsetail rushes. All in this division are marsh plants, and Moore dates them from the Middle Devonian through the Triassic as well as the Recent. Newer texts place their beginnings, as far as the fossils are concerned, in the Early Devonian.

As early as 1953, however, K. Jacob, C. Jacob, and R. N. Shrivastava report their own findings of spores of Equisetales (horsetails) in the Cambrian Suket Shales, Vindhyan System, Central India.[8] Besides their own work they cite the work of two other researchers to the same effect: the discovery of horsetail spores by Naumova from the Lower Cambrian Pre-Baltic clays in the U.S.S.R.; and the discovery of horsetail spores by Reissinger from Lower Cambrian sediments of Kunda in Esthonia. Review articles by Axelrod[5] and Leclercq[7] cite all of the above research. This represents three reports by five investigators of horsetails in the Cambrian.

E. *Division Pterophyta* (Line 10).

This division involves the ferns, and is the largest group of vascular plants that do not form seeds. Moore lists them as extending from the Middle Devonian to the present. Recent texts give the same time span. Yet, the reports of fern fossils from the Cambrian are many, and are quite impressive.

William Darrah of Harvard, in 1937, reports pteridophyte spores in the Upper Cambrian "Kolm", a Swedish oil shale formation.[9]

Ghosh and Bose[10] report their 1947 findings of pteridophyte tracheids from the Dandot overfold and the Salt Pseudomorph Beds, Salt Range, Punjab, India. Both of these formations are of Cambrian or Precambrian age. In a later report (1952, Ref. 11), they confirm their original findings with further investigations in the Salt Range of Punjab, the Cambrian Vindhyan System, and the Cambrian of Kashmir. They state that some have suggested an Eocene dating for the Salt Range because of the vascular plant fossils they contain but that a field party of geologists in 1944 unanimously rejected that as being incompatible with the field evidence. Further, the Cambrian of Kashmir has several types of trilobites in it.

In 1953, Jacob, Jacob, and Shrivastava[8] confirm the above reports by Ghosh and Bose regarding spores and tracheids of ferns in the Cambrian of the Salt Range and Spiti. They also report fern spores from the Cambrian Suket Shales, Vindhyan System, Central India.

The review articles by Axelrod[5] and Leclercq[7] refer to all of the above research. Axelrod then goes on to mention the discovery of fern spores in the Lower Cambrian Pre-Baltic clays of the U.S.S.R. by Naumova in 1949. This makes a total of ten different findings by seven investigators of ferns in the Cambrian.

F. *Division Pteridospermophyta* (Line 11).

The seed ferns are represented in this division and are now extinct. Moore, together with recent writers, places them from the Upper Devonian through the Cretaceous. Individual authors vary somewhat. None of the recent authorities refer to the report by Jacob, Jacob, and Shrivastava[8] regarding their discovery of spores and tracheids of seed ferns in the Cambrian Salt Range of Punjab, the Cambrian of Kashmir, the Cambrian of Spiti and the Cambrian Suket Shales, Vindhyan System, Central India. The review articles of Axelrod[5] and

Leclercq[7] mention all of this research. This represents four locations by three researchers of seed-ferns in the Cambrian.

G. *Division Cycadophyta* (Line 12).

Of the eleven major categories of land plants on Moore's chart, eight have been found in the Cambrian or the late Precambrian. One of the remaining three categories, the cycads, seed plants, was found only down to the Triassic. In 1976, Sergius H. Mamay of the United States Geological Survey reported the extension of the cycads down into the Late Pennsylvanian.[12]

H. *Division Coniferophyta* (Line 15).

The well-known conifers represent this division, and Moore and recent texts list the conifers as extending from the Middle Devonian to the Present. Some authorities split this division and make the earlier conifers (Devonian and Carboniferous) a separate division, the Progymnospermophyta, or primitive gymnosperms. The neglected evidence that conifers actually go back to the Cambrian is quite compelling.

In 1947, Ghosh and Bose[10] reported bordered pitted tracheids of conifers from the Cambrian Dandot overfold and the Salt Pseudomorph Beds, Salt Range, Punjab, India. In the Dandot overfold, they also discovered wood parenchyma (tissue of cortex or pith) from conifers. A second report by Ghosh and Bose (1952, Ref. 11) confirms their original findings and tells of further investigation in the Salt Range of Punjab, the Cambrian Vindhyan Syustem, and the Cambrian of Kashmir with similar results regarding conifer fossils in the Cambrian. The review articles by Axelrod[5] and Leclercq[7] include all of the above findings.

The discovery, in 1964 and 1965, by Clifford L. Burdick, of gymnosperm pollen in the Hakati Shale, Upper Precambrian of the Grand Canyon,[13] is well known to many creationists. His work has been highly criticized by evolutionists—as one would expect—but this work has been justified by subsequent creationist investigators[14] as well as by findings of evolutionists themselves (Ref. 5, 7, 10, 11).

In the light of the research presented thus far, it is very difficult to reconcile recent articles in *Nature* describing an Upper Carboniferous conifer fossil as "the earliest conifer"[15] and Silurian tracheids as the "oldest recorded *in situ* Tracheids".[16] There are at least six different locations reported by three different workers where conifers have been reported in the Cambrian and Late Precambrian.

J. *Division Anthophyta* (Line 16).

The anthophyta are the flowering plants (angiosperms). They are the largest single division of the plant kingdom and are the best known to man. Because they are the most complex, evolutionists believe that they were the last category to evolve. Moore places their beginnings in the Upper Middle Triassic. Some recent authorities place the beginnings of the flowering plants in the Jurassic or even later in the Cretaceous. Darwin called the origin of the flowering plants "an abominable mystery," and modern evolutionists admit that that is still the case.

Just as fossils of most of the other land plants have been discovered in Cambrian deposits, so it is with the flowering plants. In 1947, Ghosh and Bose[10] reported discovering angiosperm vessels with alternate pitting and libriform fibres of higher dicotyledons from the Salt Pseudomorph Beds and the Dandot overfold, Salt Range, Punjab, India. These are Cambrian deposits. They later report (1952, Ref. 11) that further investigation confirmed their original report, and the same results were obtained from the Cambrian Vindhyan System, and the Cambrian of Kashmir—these Kashmir beds also containing several types of trilobites. The review articles of Axelrod[5] and Leclercq[7] acknowledge these findings.

Clifford Burdick[13,14] reports finding angiosperm pollen grains in the Upper Precambrian Hakati Shale of the Grand Canyon in 1964 and 1965 while working with the University of Arizona. Because these results were totally incompatible with the evolutionary theory, his findings were challenged and the claim was made that what he thought were Precambrian angiosperm pollen grains were actually contamination by modern plants. Burdick's refutation of this charge seems to be beyond reproach. He states that not only were elaborate precautions taken against contamination, but that the pollen and spores were dyed a deep red because of being imbedded in the iron-rich red Hakati Shale. Further, an examination of slides of extant pollen and spore grains at the University of Arizona (one of the largest and most complete slide libraries of that type in the world) revealed none quite like these. These were extinct species or genera. Hence, contamination from present-day plants could not possibly be the explanation for these pollen grains. Thus, at least three workers have reported six separate discoveries of angiosperms in the Cambrian and Late Precambrian. In total, this paper has documented thirty-two individual localities where discoveries of land plant fossils have been made in the Cambrian or below. Writing in 1959, Axelrod (Ref. 5, p. 264) stated that at that time approximately 60 Cambrian spore-genera had been reported. This evidence should not be ignored.

K. *Land Plant Fossils of Unknown Taxa.*

A number of fossils have been discovered which are not capable of being diagnosed in terms of their proper division, but give every indication of being legitimate fossils of land plants found in strata older than the commonly accepted time for the evolution of vascular plants.

Jane Gray and A. J. Boucot[17] reported in 1974 the discovery of probable land plant trilete spores and spore tetrads from Silurian deposits on the island of Gotland in the Baltic Sea. They also reported, in 1971, the discovery of several taxa of abundant cutinized trilete spores from the earliest Silurian shale at Niagara Falls, New York. These, they say, predate by almost the entire Silurian Period vascular land plant megafossils.[18] In a 1977 article, Gray and Boucot tell of two areas in North America where spores and spore tetrads of land plants have been found in the uppermost Ordovician (Ref. 19, p. 170). They also lament the problems which attend land plant evolution and strongly defend as legitimate the evidence of palynology. In the absence of megafossils, they feel that if any new light will be shed on the origin of land plants, the evidence will come from microfossils..

Pratt, Phillips, and Dennison[20] claimed discovery, in 1978, of the earliest land plants. The remains were from earliest Silurian age deposits in Virginia and include cuticularized scraps, banded and unbanded tubes, and trilete, cutinized spores. They also found erect plant structures.

Fleming and Rigby, in 1972, reported the finding of two fossil fragments that are probably stems of land plants in the Middle Cambrian of Queensland, Australia.[6]

Melvin A. Cook[21] states that while he was serving as a consultant at the Schefferville mine of the Iron Ore Company of Canada he was shown and given samples of several fossil wood specimens that had been recovered from the iron ore deposits several hundred feet below the surface. It was a Precambrian deposit, and there were no overturns or fissures that would have allowed the material to be introduced at a later time. Two independent radiocarbon dates gave consistent ages of about 4,000 years. Attempts by some evolutionists to make this material "Late Cretaceous rubble" do not satisfy the field evidence.

No one has summed up the full significance of the evidence of the very early appearance of the vascular plants better than has Leclercq—himself an evolutionist (Ref. 7, p. 111 and 113).

> The conclusion to be drawn from these facts was that varied types of vascular plants existed in Early Palaezoic . . . In a wider sense palynology and plant impressions of Cambrian raise the major question of the polyphyletism of the vascular plants.

A Special Creationist couldn't have said it better.

III. Discoveries of Fossils of Invertebrates

A. *Phylum Bryozoa* (Line 24).

Fossils from the Black Rock limestone of northeastern Arkansas discovered as early as 1911 were thought to be bryozoans, but they were so poorly preserved that no definite determination could be made. Very recent discovery of fossils in very good state of preservation from the same formation now allows a positive identification to be made. The fossils are dianulitid bryozoans from the very early Ordovician. It is believed to be the oldest occurrence of an unquestioned bryozoan.[22] The fossil record of bryozoans is thus extended from the Middle Ordovician to the Lower Ordovician, very close to the Cambrian/Ordovician boundary. There is no question but that their ancestors had to extend down into the Cambrian.

B. *Phylum Mollusca.*

1. *Class Calyptoptomatida* (Might be assigned line 26½).

In 1962, J. Wyatt Durham and Roland A. Gangloff (University of Califonia, Berkeley), collected mollusk-like fossils from the White-Inyo Mountain area, Inyo County, California.[23] They consist of small orthoconic shells with relatively large bilaterally symmetrical protoconch-like initial termini. Some similarities exist between these fossils and members of the Cephalopods, but not enough to include them in that class. Since these fossils were found at least 900 meters below the strata containing the earliest known olenellid trilobites, it is considered Precambrian although the Precambrian/Cambrian boundary is indistinct in that area. The classification is also somewhat tentative. They were not on the original chart.

2. *Class Bivalvia* (Line 28).

This category includes the oysters, mussels, and clams. Fossils of disputed taxon from many early Cambrian localities have been identified, in 1973, as a result of specimens from the Lower Cambrian rocks of New York State.[24] Fordilla troyensis *Barrande* has been identified as the oldest known pelecypod mollusk. This finding extends the range of the Class Bivalvia backwards in time from the early Ordovician to the very early Cambrian—a step of about 100 million years according to evolutionists. It also places the animal very close to the base of the known fossil record of animals with hard parts.

3. *Class Cephalopoda* (Line 31).

One of the most remarkable fossil discoveries[25] in recent years was made by Jean B. Firby and J. Wyatt Durham in 1974. Their discovery was that of a large squid-like mollusk with tiny cone-shaped denticles (teeth) in the very early Cambrian rocks of the White Mountains near Bishop, California. The denticles appear most like those of living members of the predatory Class Cephalopoda, especially the cuttlefish (*Sepia*). These fossils were found in the lowest trilobite-bearing formation, and it is speculated that trilobites may have been the major prey of this predator.

This discovery, found at the very Cambrian/Precambrian boundary, is of major significance for a number of reasons. First, it extends the range of the Cephalopoda from the late to the very early Cambrian. Second, the cuttlefish, which are very complex invertebrate predators, had not been reported previously from strata earlier than the Jurassic, 400 million years younger according to evolutionary geologists. Third, these fossils represent predators 100 million years older than any that had been found previously.

This predatory feature has special significance because evolutionists believe that rapid and far-reaching evolutionary changes took place in the Late Precambrian and the Early Cambrian. Since all of the major animal phyla are found in the Cambrian, it means that the bulk of evolutionary diversity had to take place before that time. The reason so much evolution could take place at that time, evolutionists explain, is due to the *absence of predators.* During times of rapid evolutionary change it is assumed that animals would be more susceptible to predation because they would be in a transitional phase from one type of organism to another or from one ecological niche to another. The finding of very capable predators at the base of the Cambrian is thus a major blow to evolutionary theory.

C. *Phylum Priopulida* (Might be assigned line 31½).

The priopulids, worm-like invertebrates, had not been considered of major importance. There are only a few living members of this group and they had never been found in the fossil record. They are not on Moore's chart.

In 1978, Simon C. Morris, working in the Middle Cambrian Burgess Shale of British Columbia, found fossil priopulids. Gut contents show that these worms

were carnivorous-eating mainly hyolothids and brachiopods. In the words of Richard Cowen: " . . . here are some of the long-lost predators of the Cambrian sea-floor".[26]

In a more recent article, "The Animals of the Burgess Shale," Simon C. Morris and H.B. Whittington describe four more predators of the Middle Cambrian.[27]

They are: (1) *Opabinia*, a worm-like creature, representing a new phyla, which swam close to the sea-floor; (2) *Olenoides*, a trilobite able to feed on small worms; (3) *Sidneyia*, an arthropod, with limbs similar to the horseshoe crab, which was able to crush the shells of hard-bodied prey such as brachipods; and (4) *Nectocaris*, another representative of a new phyla, a fast swimming predator with enormous eyes, prominent dorsal and ventral fins, and numerous fin rays. Thus, at least six predators have recently been discovered in the Lower and Middle Cambrian, in which there were formerly thought to be none.

D. *Phylum Arthropoda.*

1. *Class Crustacea* (Line 36).

The ostracodes are small, bivalved members of the crustaceans. Although they are living today, they are also quite important in Paleozoic rocks because they abound in many strata and differ from layer to layer. Hence, they are often used for correlation of rock strata. Moore, in 1958, has them terminating in the Middle Ordovician. However, a newer chart by Norman Newell, 1967, shows them extending to the base of the Cambrian.[29]

2. *Class Myriapoda* (Line 37).

This class involves the familiar centipedes and millipedes—the millipedes having the older fossil record. Moore's chart shows them extending down to the Lower Pennyslvanian. Beerbower states that they are now found in the Silurian (Ref. 30, p. 328).

3. *Class Insecta* (Line 38.).

In 1970, a Melbourne University student discovered the oldest fossil flea.[31]

It is thought to be 120 million years old, putting it in the Lower Cretaceous. Since insects are known all the way back to the Middle Devonian, a 120 million year old flea should not even raise an eyebrow. However, it does pose a very interesting question. Since fleas are hosted by fur-bearing animals, and since the fur-bearing animals are the mammals, and since the mammals having fur are said to have evolved only about 30 million years ago, one could ask the question: Does that flea know something we don't know?"

E. *Phylum Echinodermata.*

1. *Class Eocrinoidea* (Might be assigned line 38½).

Moore does not have these early echinoderms on his chart. Beerbower (Ref. 30, p. 387) describes them as becoming extinct in the Ordovician. J. Wyatt Durham reports the discovery of the oldest eocrinoid in the Early Cambrian Marble Mountains of California.[32] James Sprinkle also records eocrinoids from the Early Cambrian.[33]

2. *Class Crinoidea* (Line 41).

The crinoids are the sea lilies. In 1958 they were known as far down as the lower Middle Ordovician. However, the Stephen Formation of the Burgess Shale in the Rocky Mountains of British Columbia has produced a Middle Cambrian crinoid. Morris and Whittington write: " . . . the sea lily *Echmatocrinus*, is the earliest crinoid in the fossil record . . ." (Ref. 27, p. 129). Sprinkle also confirms this discovery.[33]

3. *Class Ophiocistioidea* (Line 43).

These slender-armed star-shaped echinoderms were known in 1958 only from the Lower Mississippian and above. Beerbower states that they have been extended all the way down to the Early Ordovician (Ref. 30, p. 410).

4. *Class Echinozoa* (Line 44).

The echinoids are the sea urchins and the sand dollars. While in 1958 Moore shows them extended only to the Middle Ordovician, in 1978 Bruce Bell and James Sprinkle describe an edrioasteroid (echinoid) from the Middle Cambrian.[34] Further, both J. Wyatt Durham[32] and James Sprinkle[33] state that two types of echinoids (helicoplacoids and edrioasteroids) have been found in the Lower Cambrian near the California-Nevada border and in the Rocky Mountains of British Columbia.

F. *Phylum Coelenterata.*

Tetracorals (Line 22).

The tetracorals are corals with four-fold symmetry. Whereas in 1958 they were found only as far down as the Middle Ordovician, a review article by John Pojeta, Jr.[35] tells of a discovery in New South Wales, Australia, of Orders Rugosa and Tabulata from the Cambrian, making these the oldest known corals.

IV. Discoveries of Fossils of Vertebrates

A. *Sybphylum Cephalochordata* (Might be assigned line 46½).

A tiny animal, two inches long, with a general shape like that of a slender minnow, is known as lancet or *amphioxus*. It is not actually a vertebrate. It has, instead of a vertebral column, a hollow dorsal nerve cord running the length of its body. Below that and extending to the tip of the head is a Notochord. This latter structure consists of a tough cover and a gelatinous-like interior. It functions as a stiff but flexible beam on which the body muscles can pull. Lancet's general morphology, though relatively simple, is much like the vertebrates.

Amphioxus, although hardly a household word to most people, is of tremendous importance in the evolutionary scenario. In the words of zoologist Alfred M. Elliott (University of Michigan): " . . . it possesses body structures that force us to believe that some such form might have given rise to the vertebrates".[36]

Although capable of swimming, this animal often buries itself in bottom sediments. It is found, among other places, off the coast of California and off the coast of China—where it reaches such numbers that it is utilized as a source of food.

Amphioxus has had a very poor fossil record, and was not in the original chart. Until now it was known only from the Recent Stage. (The Recent Stage is a rather vaguely defined geologic period that generally refers to the interval between the end of the Wisconsinan glaciation and the present. This is considered to be a time peroid of approximately 10,000 years.)

Now a form very much like *Amphioxus*, known as *Pikaia*, has been found in the Middle Cambrian Burgess

Shale of British Columbia. At first this form was considered to be a polychaete worm. However, about thirty well-preserved specimens show a prominent rod along the animal's back that resembles a notochord. Morris and Whittington write (Ref. 27, p. 131):

> In addition to this key anatomical feature the blocks of muscle in *Pikaia* form a zigzag pattern that is comparable to the musculature of the primitive living chordate *Amphioxus* and of fishes. Although *Pikaia* differs from Amphioxus in several important respects, the conclusion that it is not a worm but a chordate appears inescapable. The superb preservation of this Middle Cambrian organism makes it a landmark in the history of the phylum to which all vertebrates, including man, belong. There are possible instances of even earlier chordates from Lower Cambrian formations in California and Vermont but none is as rich in detail.

B. *Subphylum Vertebrata.*

1. *Class Agnatha—Jawless Fishes* (Line 47).

Until recently, the oldest fish fossils known were from the Middle Ordovician Harding Sandstone of Colorado. These were of "primitive" heterostracan fishes (Class Agnatha) which are jawless. The Vertebrates were the only major animal group not found as fossils in Cambrian rocks.

In 1976, Bockelie and Fortey[37] reported the discovery of heterostracan fish fossils, consisting of minute scales and spine fragments, from the very early Ordovician Valhallfonna Formation on the island of Spitsbergen. They have proposed for their find the new genus *Anatolepis*. These specimens predated the Colorado fish fossils by about 20 million years. Concluding their article, they state the belief that pre-Ordovician vertebrates may exist and express hope that their discovery might stimulate such a search.

In 1977, Ritchie and Gilbert-Tomlinson reported the occurrence of two new genus of heterostracan fishes from the earliest Middle Ordovician of Australia (Ref. 38, p. 529). These specimens would be slightly younger than those reported by Bockelie and Fortey from Spitsbergen. However, they are significant in that they are well-preserved molds of articulated individuals.

The anticipation of Bockelie and Fortey was rewarded in 1978 when John E. Repetski, paleontologist with the U.S. Geological Survey branch at the National Museum, Washington, D.C., reported fish fossils from the Upper Cambrian Deadwood Formation in northeastern Wyoming.[38] These fossils have been assigned to the genus *Anatolepis* because of their great similarity to the Spitsbergen fossils. They extend the fish fossil record 40 million years beyond the Spitsbergen and 60 million years beyond the Colorado fossils according to standard geologic dating.

For Creationists, this discovery of fishes (vertebrates) in the Cambrian is without question the most significant fossil discovery in the period 1958-1979. The evidence is now complete that all of the major categories of animal and plant life are found in the Cambrian. While Creationists should remember that evolutionists claim the Cambrian extends over a period of 100 million years and that would allow for a significant amount of evolution, there is no question but that this discovery lends credibility to the Creationist position and presents problems for evolutionists.

Anatolepis was a tiny heterostracan fish of from one to three inches in length. The original discovery[38] consisted of four bony plate fragments and about two dozen individual tubercules. Since then, Repetski reports finding hundreds of plate fragments in rocks at the same Wyoming locality,[39] X-ray analysis of the scales shows that they are of bony composition. *Anatolepis* apparently had a protective armor or shield to which the scales were attached.

Repetski reports that he has also recovered *Anatolepis* fossils from Upper Cambrian rocks in Idaho, eastern Alaska, from the Upper Cambrian basil Fort Sill Limestone in southwestern Oklahoma, and from the *Middle Cambrian* Metaline Formation in northeastern Washington. He has also found additional Lower Ordovician occurrences in the El Paso Group of westernmost Texas, the Baldwin Corner Formation of eastern New York, the Wahwah Limestone of western Utah, and in the Black Rock Limestone of northern Arkansas. Reports tell of additional occurrences in the Lower Ordovician of eastern Greenland.

From the geographical occurrences of *Anatolepis*, it is obvious that it had an extensive range. It is also obvious that we are not dealing with an insignificant Cambrian phenomenon. Furthermore, all of the occurrences are in what Repetski states are of "undoubted marine origin". It deals a serious blow to the long-standing evolutionary teaching that the earliest vertebrates originated in fresh-water habitats.

2. *Class Chondrichthyes—Sharks* (Line 49).

Raymond Moore, in his 1958 chart, shows the fossil record of sharks extending down to the Upper Middle Devonian. In 1979, D.A.T. Harper reports spines of the spiney shark in the Upper Ordovician Lady Burn Starfish Beds at Girvan, southwest Scotland.[40] This represents an extension of approximately 80 million years in the fossil history of sharks.

Two fish spines were found, the better preserved one being 13 cm. long. Harper refers to the unusually early appearance of this type of vertebrate material in the fossil record and states: "Most probably the spines are those of an acanthodian (spiney shark)" (Ref. 40, p. 634).

3. *Class Reptilla.*

a. Order Squamata—Lizards and Snakes (Line 58).

In 1958, Moore shows the lizards and snakes extending to the Upper Middle Permian. In a 1977 article in *Science*,[41] Robert Reisz tells about fossils known as *Petrolacosaurus kansensis* ("rock lizard") extending down into the Upper Pennsylvanian. This form was a slender, delicately limbed lizard about the size of an average iguana. Many of these fossils have been found in the Rock Lake deposits near Garnett, Kansas.

What is especially interesting about this article is that what gives every evidence of being just an ancestral lizard is made into a major transitional form by this evolutionary writer. He claims that this fossil lizard, which he calls the oldest known diapsid reptile, is an evolutionary link relating the ancestral stem reptiles and the dawn of diapsids. Diapsids include the over-

whelming majority of living reptiles (three of the four orders) and such extinct groups as eosuchians, thecodonts, dinosaurs, the flying pterosaurs, and one that eventually gave rise to birds (Ref. 41, p. 1091). yet, a careful study of the article gives compelling reasons for saying that it represents an extension in the fossil history of lizards. Nothing more. Beerbower (Ref. 30, p. 464) writes:

> The lizards and snakes (order Squamata, suborder lacertilia and Ophidia) have been the true heirs of the primitive diapsids. Most retain the pineal eye and the primitive palate and resemble the late Permian form in size and adaptations.

b. *Order Pterosauria—Flying Reptiles* (Line 61).

The largest known flying creature ever to inhabit the earth describes a series of fossil discoveries made by Douglas Lawson beginning in 1971. In a remote section of Big Bend National Park in southwest Texas, Lawson has unearthed the fossil remains of three pterosaurs—one of them having an estimated wingspan of 51 feet, twice as large as any flying reptile previously discovered. By way of contrast, the bird with the largest wingspan, the wandering albatross, measures 11 feet, and the McDonnell Douglas F-15A jet fighter has a wingspan of 43 feet.

Pterosaurs had bat-like leathery wings, long, powerful necks, and pelican-like jaws. Although they were originally thought to be fish eaters, the remains were found in Late Cretaceous nonmarine sediments far from the ancient coast. The fossil discovery includes vertebra, humerus, and wing bone material of the larger specimen. An almost complete skeleton of a smaller specimen was found, as well as remains of a third one of intermediate size.[42]

C. *Order Saurischia—Lizard-Hipped Dinosaurs* (Line 63).

James A. Jensen, Director of the Earth Science Museum, Brigham Young University, is one of the most remarkable paleontologists of our day. Not only was he responsible for discovering some of the crucial fossils that provided evidence to the geological world that the continents were once linked together, but in the Summer of 1972 he discovered the world's largest dinosaur.

This dinosaur is significant not because of its dating but because of its size. Two shoulder blades, a pelvis, and five vertebrae were discovered by Jensen in western Colorado's Uncompahgre National Forest, near the town of Delta. Although it has a superficial resemblance to the huge herbivorous Brachiosaurus, Jensen feels that it is different enough to be an entirely new species. Estimates are that the dinosaur was 50 feet tall, 100 feet in length, and weighed 80 tons. That would make it approximately three times as large as the largest dinosaur now known, and place it in the range of size of the blue whale—called the largest creature on earth. A land creature the size of the blue whale staggers the imagination, and causes one to stand in awe at the engineering ability of the Creator.

Reports of Jensen's dicovery first appeared in *Time*, August 21, 1972, and later in its *1973 Nature/Science Annual.*[43] The absence of any report in the scientific journals caused me to contact Jensen personally about these fossils. He reports that he has found two entirely different faunas—neither one of which has been known before. Very seldom has this ever happened in paleontology. The first new fauna is at the site of the dinosaur discovery. It is Dry Mesa Quarry in the Morrison Formation, western Colorado, and is a very Late Jurassic to Early Cretacean sequence. The second new fauna is in an area of eastern Utah and is higher in the Morrison Formation. The area is so productive, the work so slow and so costly, that he does not know when he will have the material complete enough to report it. He has been working it steadily each Summer since 1972. *Science News*, August 4, 1979, reports an even larger dinosaur find by Jensen at the same place.

4. *Class Aves—Birds* (Line 68).

Although *Archaeopteryx* continues to be the oldest fossil bird discovery, dating from the Upper Jurassic of Bavaria and elsewhere, it must now share antiquity with another more modern type bird fossil discovery. Since most evolutionists felt that *Archaeopteryx* was a transitional form in the evolution of birds from reptiles, the discovery of a more modern type of bird that was contemporary with *Archaeopteryx* seems both to indicate a greater antiquity for birds and to effectively remove *Archaeopteryx* from the role of a transitional form. The result is a strengthening of the creationist position and a further eroding of the alleged evidence for evolution.

The new bird discovery, also made by James A. Jensen of Brigham Young University, has thus far been reported only in *Science News*, September 24, 1977.[44] The original report was of a bird femur and two articulated shoulder bones. This discovery was made in Dry Mesa Quarry, in western Colorado, where Jensen had also discovered the world's largest dinosaur. The finding of birds and dinosaurs together also makes more questionable the evolutionary concept that birds evolved from dinosaurs.

Jensen states that his fossil bird is 60 million years older than any previously found oldest bird. However, he takes the position, as do many other evolutionists[45] that *Archaeopteryx* is just a feathered dinosaur and should not be classed as a bird at all.

Because nothing had apeared in the scientific literature about this discovery, I personally contacted both Jensen and John H. Ostrom (Professor of Geology and Curator of Vertebrate Paleontology, Peabody Museum, Yale University), also quoted in the original *Science News* article as having verified the discovery. Jensen now feels that the original articulated shoulder bones are actually the scapula and coracoid of a flying retpile (order Pterosauria). However, he recently has found a second bird femur and two articulated tibia—metatarsals (lower leg and foot bones). He states that they are quite different from the comparable bones of reptiles and quite different also from *Archaeopteryx* in that they are more modern. He also stated that he had found the remains of *Hesperornis*, which Alfred Romer describes as both primitive and specialized: " . . . much like the modern loon in habits . . . " (Ref. 46, p. 167).

Jensen feels that he needs much more material before he can report these discoveries with any specifics. He gave no date as to when this would be, but said he would probably publish it in the *B.Y.U. Geology*

Studies or in the *Journal of Paleontology*.

5. *Class Mammalia—Mammals.*

a. *Mesozoic Mammals* (Line 69).

In 1958, the Moesozoic mammals, the Multituberculates and related orders, were extended down into the very late Jurassic. Freeman[47] states that by 1976 they had extended down into the very late Triassic. Their first occurence was about 190 million years ago, according to evolutionary geology.

b. *Order Chiroptera—Bats* (Line 72).

In 1966, in the journal, *Science*, Glenn L. Jepsen (Princeton University) gave a study he had just completed on a fossil bat found 33 years before.[48] He remarks that it is one of the most remarkable vertebrate fossils ever discovered both in its state of completeness and the preservation of the soft tissue structures. Other than having a clawed index finger, this microbat is virtually identical with bats of today and is included in the same sub-order, Microchiroptera, as are living bats. It is of special interest that the bat had the same highly developed echolocator equipment as do modern bats. The bat was found in the Green River Formation, early Eocene deposits, at famous Fossil Butte in southwestern Wyoming.

Perhaps the most important thing is not what Jepsen's article said but what it didn't say. Jepsen gave a report on this bat at the annual meeting of the American Association for the Advancement of Science before the article was published in their journal. Dr. Wilbert C. Rusch, Sr., Prof. of Science, Concordia College, Ann Arbor, Michigan, was in attendance at that lecture. He reports that Jepsen set forth a problem for evolution that he did not mention in the article. The problem is that if one has a fully developed, modern, specialized bat in the early Eocene, 60 million years old, at a time when the Class Mammalia was in the relatively early stages of its evolutionary development, then the evolutionary antecendents of that bat would have had to extend down into the Paleozoic Era, which from the standpoint of evolution is out of the question. Jepsen was not quite bold enough to put that dilemma into print, but it is a problem which evolutionists must squarely face.

c. *Order Primates, Genus Homo* (Line 74).

Although the human fossils are beyond the scope of this paper, a listing of the most significant fossil discoveries since 1958 should at least make mention of two extraordinary ones about which many Creationists are already aware. The first is the discovery of human footprints *in situ* with dinosaur footprints in the Cretaceous strata of the Paluxy River, Glen Rose, Texas. The most recent report of these tracks is by Wilbur Fields.[49]

A burned branch, about 2.25 m. long, was found buried in a limestone layer which contained many dinosaur tracks (Ref. 49, p. 23). A sample of the charcoal from this branch was submitted to the radiometric dating laboratory at the University of California, Los Angeles, by Mr. Fredrick Beierle. The reply, by Dr. Berger of the U.C.L.A. laboratory, was that the sample, labeled UCLA-2088 and dated Nov. 6, 1978, was 12,800 plus or minus 200 years old.[50]

The second remarkable discovery deals with the matter of human footprints *in situ* with trilobites, discovered by William Meister, Sr., in 1968 in the Cambrian "trilobite beds" of Antelope Springs, in western Utah.[51] These discoveries have tremendous implications for evolutionists and Creationists and deserve full, impartial study.

d. *Order Carnivora* (Line 76).

Although dogs have not been discovered at the base of the Cretaceous, fossil fleas have been.[31] Is it possible to have fleas without host animals? This is speculation, perhaps, but we wait with interest the fossil record in this area.

e. *Order Condylarthra* (Line 81).

The condylarths, now extinct, were herbivorous sheep-size animals that were known, according to Moore, only from the lower half of the Cenozoic. However, Sloan and Van Valen, in their research in 1963 and 1964 at the Fort Peck Reservoir area of northeast Montana reveal that the Condylarths extended down into the Upper Cretaceous.[52]

Conclusion

A review of the developments in the fossil record since Raymond Moore prepared his chart in 1958 reveals that the 86 categories are as distinct now as ever; that there is a general trend toward polyphyletic origins in the Cambrian; and that the transitional forms demanded by the theory of evolution are as absent as they were in 1958. The result of 21 years of paleontological discovery is further confirmation of the concept of Special Creation and a lessening of the credibility for the concept of organic evolution. The fossil record continues to provide a rigorous, objective, historical, and scientific foundation for the concept of Special Creation.

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NOTES ON THE USE OF STATISTICS IN THE DEBATE OF CREATION VERSUS EVOLUTION

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A statistical argument commonly used by Creationists and in Creation Research is reviewed and examined. Suggestions are put forward for some ways to refine the handling of statistics. It is urged that Creationist research in statistics and probability be continued and improved; but a modification in future emphasis is suggested.

Statistics today are research tools commonly used by many in physical and social sciences, the media, business, government, and even gambling. While "statistics" is a very broad term, there is a simple, recurring use of statistics, especially in probability form, in various Creation-oriented writings. The level of statistical calculation used in the Creation-evolution debate is such that people with no specialized background in mathematics and probability theory can grasp the argument. In this paper I try to show some problem areas in the argument in hopes that doing so will stimulate discussion and possibly a shift in research emphasis.

Briefly, this argument states one has reason to believe that a sequence of events has been planned if that sequence of events has an incomprehensibly low probability of occurring purely by chance. Sometimes this

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