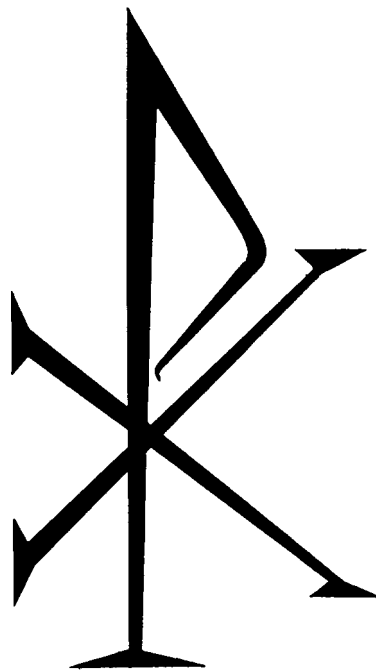


CREATION RESEARCH SOCIETY

QUARTERLY



Haec credimus:

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

CREATION RESEARCH SOCIETY QUARTERLY

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EDITORIAL COMMENTS

In our September issue we asked the questions, "Can the age of stratified rocks and fossils really be estimated by radioactivity dating techniques? Is radioactivity dating valid?" Surprisingly we found that radiocarbon dating, properly interpreted, indicated ages remarkably close to those of Bible chronology. The same is true of potassium-argon dating according to Professor Whitelaw.

In this issue we are examining just what certain geological formations show as to the time of appearance of various animals and plants. We are usually taught that there is a very definite sequence from the simple to the complex, in conformity with evolutionary theory.

Human Sandal Prints

The recent amazing discovery of human sandal prints in trilobite beds near Antelope Springs, Utah, by Mr. William Meister certainly is jolting to the usual paleontological concept that trilobites existed millions of years before man. There have been reports before of human footprints found in Mesozoic formations presumably deposited long before man appeared on the scene of action. However, they were not authenticated by witnesses at the time of discovery, hence have always been considered faulty as evidence.

Fortunately Meister immediately showed his discovery to Dr. Melvin Cook and many others as referred to in his report. There can thus be no question as to its authenticity. The article from the *Newark Sunday News* is reprinted in order to present the rather amusing theory of Dr. Jesse Jennings that the footprint is the outline of a very large trilobite!

Plant Fossils Also

Similarly with plants, the impression given by most textbooks of paleontology is that the earliest rock formations such as the Cambrian have only relatively simple plants such as calcareous algae. Professor Wilbert Rusch, clearly shows that this idea must be abandoned.

The strength of his article lies in the fact that he cites **only** research men who are evolutionists! Thus Axelrod records about 60 Cambrian spore genera of various complex plants. Leclercq believes that the occurrence of vascular plants in the Cambrian is well established. These points are about as amazing as the discovery of human footprints in the Cambrian. In addition, of course, we have the research of Dr. Clifford Burdick reported in the *Creation Research Society Annual*, 1966, where he describes and illustrates spores from the Cambrian, and even Pre-Cambrian, in the Grand Canyon.

Clearly, as Rusch concludes in a somewhat mild understatement: "Some of the new finds in the field of paleontology, rather than driving the last nail in the coffin of creation, would seem to continue to keep it alive as a viable alternate theory to that of evolution."

Plant Survival Problem

Those of us, who believe in a world wide flood of the severity and magnitude described in Genesis 6-9, have a problem in accounting for survival of so many different genera and species of plants. The account describes in considerable detail how the basic stock of air breathing animals were especially taken care of in a supernatural manner, but nothing is said of plants.

The paper of Dr. George Howe is therefore an excellent research start in the right direction. Further work is necessary to completely explain plant survival. No doubt many seeds and parts of plants were buried in the upper levels of the freshly deposited sedimentary layers. Possibly such seed was protected from harmful exposure to salt water. Experiments to test the degree to which various depths of burial in soil removes salt from water would be of great value.

We are indeed happy to present another college having the creation point of view. Obviously no attempt can be made in the presentations to answer such questions as teacher training approval or accrediting. In the final analysis proof of successful teaching depends on the performance record of graduates.

Many of the interesting items sent in by Harold Armstrong have been accumulating due to lack of space. Accordingly we are giving him more room for his "News and Views." His item on the recovery of a man who lost half of his brain during the war, attended Oxford and now works in electronics is fascinating, and I especially like his discussion of the implications of this.

And Book Reviews

Finally, we are fortunate in having three fine book reviews. It is interesting to note from Donald O. Acrey's review that even orthodox geologists are no longer so slavishly dedicated to absolute uniformitarianism. Dr. Emmett Williams' detailed review of the Wistar Institute's Symposium on evolution merits careful study.

We are much indebted to Dr. Williams for this fine review and it is hoped that many of our members will familiarize themselves with this
(Continued on Next Page)

unusual symposium. Even Sir Peter Medawar admits,

Then, there are philosophical or methodological objections to evolutionary theory. They have been well voiced by Professor Karl Popper—that the current neo-Darwinian Theory has the methodological defect of explaining

too much. It is too difficult to imagine or envisage an evolutionary episode which could *not* be explained by the formulae of neo-Darwinism. (p. xi)

--WALTER E. LAMMERTS
Editor

COMMENTS FROM THE PRESIDENT

We in the Creation Research Society recognize of course that a man can be a sincere Christian, even an active and useful Christian, and still be a theistic evolutionist. But we do insist that one cannot be both a Christian and an evolutionist and be consistent!

The concept of evolution is diametrically opposite to the fundamentals of Biblical Christianity. A man must resort to extreme methods of Biblical hermeneutics, and to extremes of extrapolation and statistical improbabilities in the scientific data, if he is to produce any semblance of harmonization between the two. Sensing this fact, most Christian evolutionists solve the problem by ignoring it.

I have often challenged such men to explain why Christ accepted the Genesis account of creation as historically accurate, if He was really the Son of God and if the account is only allegorical rather than historical (note Matthew 19:3-6, for example). Liberals of course answer this by saying either that Jesus was limited by the culture of His own era or else that the Gospel writers reported His words incorrectly. Such explanations are not available to the Bible-believing Christian, however, and I have never to this day heard a serious answer to this difficulty by evangelical evolutionists.

Some Christians have been so intimidated by the pervasiveness of evolutionist influence that they have jumped too quickly on the "evolutionary bandwagon." As a matter of fact, the scientific evidence supporting the evolutionary system is notoriously subjective in nature, but-tressed almost entirely by circular reasoning and superimposed hypotheses.

In the meantime, solid evidence against even the very possibility of evolution continues to accumulate. The discovery of a sandal footprint in a Cambrian formation demonstrates clearly that man was contemporaneous with his earliest supposed ancestors. The statistical absurdities of evolutionary theory are more and more being recognized by mathematicians and physical scientists. These and other significant developments are discussed in this *Quarterly*.

We would strongly urge our Christian col-

leagues in the various sciences to abandon the anti-Christian and unscientific dogma of evolution and to devote their God-given abilities and opportunities to a positive witness supporting the fact of special creation as taught in the Word of God. There are undoubtedly thousands of scientists, engineers and other well-educated men and women in America today who consider themselves to be true Christians and who believe the Bible to be divinely inspired. If all of these people would withdraw their support of the evolutionary system (even silence, on such an issue as this, implies assent) and give real support to the Biblical record, regardless of personal consequences, I believe we could see a remarkable revival of genuine Biblical Christianity in our land in our time.

Of course revivals built on emotionalism and personalities are bound to be superficial and ephemeral. What is urgently needed is the re-establishment of the Bible and its complete world-view as the only realistic and intellectually satisfying foundation for life. Not only scientists, but even more the *sciences*, need to be won for Christ!

These sciences, especially the historical sciences (geology, anthropology, paleontology, etc.) have been almost completely controlled by evolutionists for a hundred years, and there is urgent need for Christian scholars to accomplish a complete re-structuring of the mass of data now accumulated in each science within the true framework of Biblical creationism.

We ought to remember that we shall all one day be called to give an account of the stewardship of our time and talents before God. "For unto whomsoever much is given, of him shall be much required (Luke 12:48). We can be sure that these gifts were not entrusted to us for the purpose of bringing about a compromising conformity of the Word to the world. In the light of the certain coming of that Day, should not each Christian scholar ask himself: "Who knoweth whether thou art come to the kingdom for such a time as this?" (Esther 4:14).

--HENRY M. MORRIS
President

WILLIAM J. MEISTER DISCOVERY OF HUMAN FOOTPRINT WITH TRILOBITES IN A CAMBRIAN FORMATION OF WESTERN UTAH

MELVIN A. COOK*

Early in June, 1968, I was introduced to Mr. Meister by Burton Tew, Research Scientist, Baccus Works, Hercules Incorporated. Mr. Meister had with him a most remarkable fossil specimen of a human footprint embedded in which were two very distinct and easily recognizable trilobites and several smaller, less distinct ones.

The specimen comprised two approximately inch thick slabs displayed in a plaster-of-paris cast. One slab contained the footprint and its associated trilobites and the other its mold. The footprint was that of the right foot of a human wearing a sandal. The rock in which the print was impressed was obviously natural, genuine, and characteristic rock.

Since Mr. Meister's interesting discovery, other persons have found similar but less spectacular specimens in the same area, two of which have been shown to me.

In late August, Dean Bitter, educator in the public schools of Salt Lake City, showed me a specimen of rock with two sandal-shod footprints he claimed to have found in diggings in a hill at Antelope Springs near that where the Meister

*Professor of Metallurgy, University of Utah, and President, IRECO Chemicals, West Jordan, Utah.

fossil was discovered. Later Mr. Meister showed me a specimen he said was discovered by George Silver, a friend, in the same location as the original discovery.

While neither of these specimens revealed trilobites in the footprints themselves, one of them showed a small trilobite in the same rock. The sandals appeared to be of the same vintage in the five prints that have been exhibited to me.

In a telephone conversation with Dr. Clifford Burdick and Mr. Meister, I learned that Dr. Burdick had discovered the footprint of a barefoot child when he went with Mr. Maurice Carlisle to the site of the Meister discovery to check the authenticity of it.

While I am by no means an authority on fossils and footprints, the Meister specimen seems to me clearly to speak for itself. Even aside from any doubt as to the identity of the formation in which the discovery was made, it is a serious contradiction of conventional geology. That is, the feature of this specimen is the intimate simultaneous occurrence of modern (sandal-shod) men with trilobites. Furthermore, no intellectually honest individual examining this specimen can reasonably deny its genuine appearance. Finally, in my judgment, Mr. Meister is a fine gentleman of complete honesty and integrity.

DISCOVERY OF TRILOBITE FOSSILS IN SHOD FOOTPRINT OF HUMAN IN "TRILOBITE BEDS"-A CAMBRIAN FORMATION, ANTELOPE SPRINGS, UTAH

WILLIAM J. MEISTER, SR.*

As a trilobite collector and "rockhound," I have often enjoyed searching "the trilobite beds" of Antelope Springs, about 43 miles northwest of Delta, Utah, for my favorite fossil. Although I had previously found many excellent trilobite specimens in this so-called Cambrian formation, none can compare with my astonishing discovery of June 1, 1968.

I arrived at Antelope Springs on Decoration Day in company with my wife and two daughters and Mr. and Mrs. Francis Shape and their two daughters. We all remained at this location four days. Upon arrival we immediately began chiseling at the rock in search of trilobites.

Trilobite Within Footprint

On the third day while the Shapes were relaxing in camp (the four girls were with us), I

*Mr. Meister is Drafting Supervisor, Baccus Works, Utah, Hercules Incorporated.

broke off a large, approximately two-inch thick slab of rock. Upon hitting it on the edge with my hammer, it fell open like a book. To my great astonishment I saw on one side the footprint† of a human with trilobites *right in the footprint itself*. The other half of the rock slab showed an almost perfect mold of the footprint

†Editor's Note: In telephone conversation, Dr. Melvin Cook has reported that, according to William J. Meister, the trilobite beds are located about halfway up a 2000 foot fairly high, mountain face. (See Figure 6.) The strata are horizontal. Meister was forced to stop many times as he climbed up the face of the mountain. He had to make footholds in order to climb and to work in the area which was about halfway up the side. There was a ledge-like protrusion from the face below the working area.

Quite obviously this footprint could not be the result of any carving since, until found by Meister, it was covered by the strata above.





Figure 2. Enlargement of fossil Trilobite from heel part of Figure 1. Photo by Enno Drown.

and fossils. Amazingly the human was wearing a sandal!

The footprint measured $10\frac{1}{4}$ inches in length, $3\frac{1}{2}$ inches in width at the sole, and 3 inches in width at the heel. The heel print was indented in the rock about an eighth of an inch more than the sole. The footprint was clearly that of the right foot because the sandal was well worn on the right side of the heel in characteristic fashion. A photograph of the footprint and its mold are shown in Figure 1.

The most remarkable feature of the footprint was that it had in it several easily visible trilobites. One of the most distinct trilobite fossils occurred on the right side of the heel of the footprint. An enlargement of this fossil is shown in Figure 2. Another of comparable size was found toward the front of the footprint, an enlargement of which is shown in Figure 3. Some of the smaller trilobites may be seen in the enlargement from the sole shown in Figure 4. These enlargements were kindly made for me by Enno N. Drown, photographer at Hercules Incorporated.

Shortly after discovering the human footprint with its associated trilobites, I mounted my specimen in plaster-of-paris to make sure it would not become mutilated, and, in company with Burton Tew, an associate at Hercules Incorporated, I showed it to Professor Melvin



Figure 3. Enlargement of fossil Trilobite from front portion of footprint of Figure 1. Photo by Enno Drown.

A. Cook of the University of Utah. He recommended that we show it to some of the geologists at the University of Utah, but I was not able to find one who would take time to examine it. However, I was able to obtain considerable favorable publicity from the Deseret News (Figure 5 was taken by a Deseret News photographer), and an article was carried by UPI nationally as well as internationally.

Further Corroborating Finds

On July 4, I accompanied Dr. Clarence Coombs, Columbia Union College, Tacoma, Maryland, and Maurice Carlisle, graduate geologist, University of Colorado at Boulder, to the site of the discovery. After a couple of hours of digging, Mr. Carlisle found a mudslab which he said convinced him that the discovery of fossil tracks in the location was a distinct possibility, since this discovery showed that the formation had at one time been at the surface.

The first week in August, Dr. Clifford Burdick, well-traveled consulting geologist of Tucson, Ariz., visited the site of the discovery at Antelope Springs with Mr. Carlisle. On this visit Dr. Burdick found a footprint of a barefoot child in the same location as my discovery. He showed me this footprint August 18. The day before, my family and I had met Dr. Burdick at Ante-

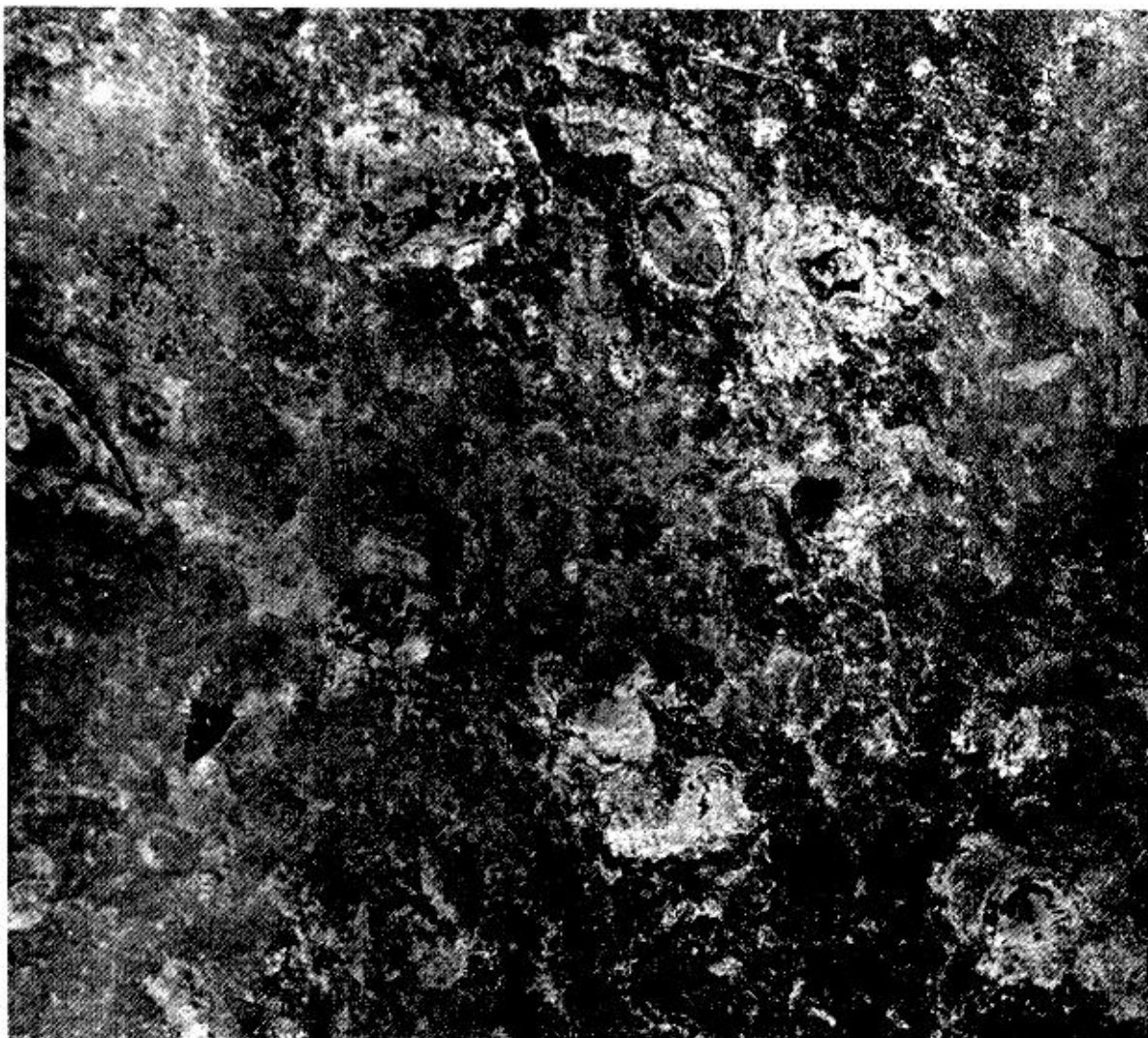


Figure 4. Enlargement of instep portion of footprint of Figure 1, showing several small fossil Trilobites. Photo by Enno Drown.

lope Springs. While there we found another sandal print. Dr. Burdick continued, and on Monday, August 19, he informed me by letter that he had found a second child's footprint.

In addition to my discovery and that of Dr. Burdick, a friend of mine, George Silver, digging alone in this location discovered more footprints of a human or human beings also shod in sandals. His specimen which he showed me (I also showed this specimen to Dr. Melvin Cook) had two footprints, one about a half inch above and on top of the other. Finally, Dean Bitter, teacher in the public schools of Salt Lake City, discovered other footprints of human beings wearing sandals much like those found by George Silver and me. Both Dr. Cook and I have seen his specimens found at Antelope Springs some dis-

tance from the site of my discovery.

While I had previously been little concerned with the different explanations of the fossil record, my discovery of a shod, and therefore obviously modern, human footprint associated intimately with trilobites has converted me completely to the story of the Bible. That is, the Bible alone provides a possible explanation of this remarkable occurrence of trilobites and humans obviously alive and together at the same time. To me it seems clear that this particular fossil is in some way related to Noah's Flood, but just how I do not know.

Leland J. Davis, Consulting Geologist of Salt Lake City, kindly agreed to outline for me the geology and stratigraphy of the formations where the discoveries described above were made.



Figure 5. William J. Meister with "opened" two-inch thick slab of rock in which he found footprint containing fossil Trilobites. *Deseret News* photograph.

Following is the letter he wrote to me on August 30, 1968:

DAVIS AND DAVIS
CONSULTING GEOLOGISTS
2060 Ribbon Lane
Salt Lake City 17, Utah
CR 7-0106

August 30, 1968

Mr. W. J. Meister
4341 West 5015 South
Salt Lake City, Utah

Dear Sir:

At your request the following is a geologic and stratigraphic report on the Cambrian sequence and of the Trilobite fossil collecting area near Antelope Springs in West Central Utah. The area is located approximately 50 miles west of Delta, Utah.

General Geology

The Antelope Springs area is located in the Basin and Range Province. The House Range is the major structural feature in the area and is a typical northerly trending basin—range "block" consisting almost entirely of Cambrian strata. The dip of the strata is generally easterly. The steep west slopes of the House Range are

traditionally conceived as a dissected fault scarp, together with its more gentle dipping eastern slope. In many places this eastern flank is characterized by dip slopes, and has lead to a general belief that the range has been elevated and tilted along a normal fault at its western base.

Increased evidence of Tertiary thrusting in the Great Basin should also be considered a possibility in this area.

Stratigraphy

(a) Correlation

Chart 1 is a columnar section of the Cambrian strata. Widespread continuity of strata units in the miogeosynclinal cordilleran region is a well known correlation of Cambrian strata that involve rock units (formations only). Wheeler (1948) has shown that biostratigraphic and lithologic correlations are rather closely parallel in the more calcareous (non-detrital) portions of the succession; while divergence between these two types of correlation (temporal transgression) is usually evident in the detrital units, especially those nearest the Cambrian base.

For example, the Burnt Canyon limestone is probably closely contemporaneous in both the

AGE	FORMATION	THICK- NESS	LITHOLOGY	ZONE FOSSILS
OBOLV.	CHOCOEHEBRY?	285' +		
UPPER CAMBRIAN	NOTCH PEAK LST.	1490'		--- <i>Ilacmurus</i>
	"ORB" and "WEEKS" FORMATIONS	3500'?		--- <i>Tricrepicephalus</i>
				--- <i>Tricrepicephalus</i>
				--- <i>Cedaria</i>
MIDDLE CAMBRIAN	MARJUM LST.	1530'		
	WHEELER FM.	440'		--- <i>Agnostus cf. interstrictus</i>
	SWASEY LST.	395'		--- <i>Asaphiscus wheeleri</i>
	DOMIE LST.	325'		--- <i>Elrathia kingi</i>
	BURNT CANYON LST.	200'		--- <i>Elmiania</i>
	BURROWS LST.	340'		--- <i>Elmioniella</i>
	MILLARD LST.	275'		--- <i>Glossopleuro</i>
	BUSBY QUAZITE	150'		--- <i>Kootenia</i>
LOWER CAMBRIAN	PIOCHE SHALE	265'		--- <i>Zacanthoides</i>
	PROSPECT MOUNTAIN QUARTZITE	1000' -		--- <i>Clonellus</i>

Chart 1. House Range Cambrian Columnar Section.

ROCKHOUND FINDS PUZZLING FOSSIL

Reprinted from NEWARK SUNDAY NEWS
July 14, 1968

SALT LAKE CITY (UPI) —An amateur rockhound William Meister, has found what appears to be a human sandal print with a trilobite, an extinct marine animal, imbedded in the fossilized footprint.

James Madsen, curator of the Museum of Earth Science at the University of Utah, said "there's something of a problem there," since trilobites and humans are separated by millions of years.

Trilobites, a class of arthropods with shells, were among the first marine invertebrates living in the Cambrian period of the Paleozoic era. Man, however, did not become dominant until the most recent geological period.

Puzzling Fossil

Meister, chief draftsman at the Hercules, Inc., Bacchus plant west of Salt Lake City, found the puzzling fossil in June while digging at Antelope Springs near Delta, Utah, an area known for its abundance of trilobite fossils.

During the weekend encampment with his family, Meister sliced open a chunk of shale and found what appears to be a sandal print with

three readily discernible trilobites, as though a human had stepped on them and the print was fossilized.

The sandal print, about the same size as an average man's shoe, is shaped like a right shoe and rounded on the outside edge of the heel, as is the case in normal wear of a shoe.

Theory Offered

Dr. Jesse Jennings of the University of Utah's anthropology department theorized that the outline, which appears to be a sandal print, may be the outline of a very large trilobite, which had been crushed and fossilized along with the smaller trilobites.

Madson was inclined to believe the find was the product of a natural occurrence. He said he has a piece of sandstone dated 170 million years old with what appears to be a human footprint and a chunk of limestone from the ocean floor with a shape similar to the fossil remains of an elephant's tooth. Madsen said he is convinced both were merely natural occurrences and not actual impressions.

The 64-year-old Meister retires next year and plans to devote full time to digging in the remote Antelope Springs shale.



Figure 6. Field view of mountain face where footprint containing fossil Trilobites was found by William J. Meister.

House Range and at Pioche, Nevada; whereas the Pioche shale appears to have begun its accumulation considerably earlier at Pioche than in the House Range area mentioned. This indicates a near shore environment existed in the Antelope Springs area during the deposition of the Cambrian strata.

(b) Wheeler Formation

The Wheeler is exposed in the Wheeler Amphitheatre east of Antelope Springs on the east slope of the House Range. This area is famous for its fossil trilobites (especially *Elrathia* and *Agnostis*) and phosphatic brachiopods. The Wheeler consists of dull sooty-gray, fine-grained, thin, fissile, shaly limestones and calcareous shales. This formation is a valley and slope-maker with platy shale ledges wherever found in the House Range.

Very truly yours,
LELAND J. DAVIS
Consulting Geologist

LJD/b

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THE REVELATION OF PALYNOLOGY

WILBERT RUSCH, SR.*

A brief description of the science of palynology is given. The science is possible because the ornamentation and sculpture of the outer pollen wall or exine is remarkably durable. Palynologists have been able to assign microspore of Cenozoic and Mesozoic rocks to modern families, genera and even species. In the last fifteen years spores of vascular plants have been reported from the Cambrian. Axelrod reports over 60 Cambrian spore genera are now on record. Leclercq believes the finding of spores of woody plants already in the Cambrian raises the question of the polyphyletic origin of vascular plants. This is another way of saying that, as far back as we can trace geologically, plants are as distinct from one another as now. This certainly is strong evidence for an original creation of them as distinctive kinds.

Introduction

It has frequently been admitted that the only real compulsive evidence for evolution (ameba to man form) must lie in the geological record. And yet that record often contains evidence that apparently mitigates against a history of phylogenetic developments, i.e. forms developing from simple to complex, which typifies the developmental schemes so prevalent in biology and geology texts in the past.

In recent years a new branch of plant science has developed which is called palynology. This is the study of microspore and pollen grains of plants. Palynology as an organized science is possible because of the ornamentation and sculpture of the surface of the pollen grains, a feature of great value for classification purposes.

Pollen grains have outer wall known as the exine. This is composed of an amazingly durable substance called sporopollenin. Since the outer walls of the spores are rather durable, they seldom undergo replacement or chemical alteration, and are also resistant to most forms of chemical and biological decay. Fossil pollen usually consists solely of this exine.

Among other features, these grains may have thin areas in their outer walls in the form of germinal pores or furrows, or both. The furrow is called the colpus. Pollen grains may then be classified as one of two possible types. The monolete, with one germinal furrow, occurs in monocotyledon, cycads, cycadeoids and seed ferns, as well as some woody dicotyledons. The trilete type with three germinal furrows, is found in most dicotyledons.

Preparation and Interpretation

Preparation of microspore for paleontological study is a rather lengthy process. Microfossils must be liberated from the sedimentary matrices and then concentrated by methods such as centrifugation and density gradients. Rigorous cleanliness is essential at all steps to guard against contamination by drifting present day

samples. Once extraction is completed, the polleniferous material is mounted on a microscope slide. Good photomicrographs of the resulting samples require exposure at different focal planes so that all the detail of structure and sculpture may be observed.

After these features of pollen grains were recognized, attention was given to the Pleistocene peat and lacustrine (lake-bed) sediments in an attempt to reconstruct the flora of that time on the basis of the pollen grains present. This procedure was later extended for the same purpose to the Tertiary formations of Western Nebraska to similarly determine the grasses present at the time of deposition of these sediments.

Palynologists have been able to assign microspore that have been found in Cenozoic and Mesozoic rocks to modern families, modern genera, and sometimes to modern species of the plant world. Statistical comparisons of "pollen rains" of the present to fossil pollen distribution and counts have been the basis of attempts to estimate the abundance of fossil parent plants at the time of deposition of sediments. As the techniques of palynology were refined, it has been possible to extend the search for and study of fossil microspore into Paleozoic formations.

Palynology Extended to Paleozoic

Results of this extension have been rather startling. One can usually find statements in texts implying that the Cambrian plants are the simplest possible—namely, all algae, or that the whole life record of the Cambrian is marine.¹ Museum displays give the same message in their beautiful but imaginative reconstructions of Cambrian life.

But within the last 15 years, spores of vascular plants have been discovered in the Lower Cambrian of Kunda in Estonia; the Pre-Baltic of the U.S.S.R.; the Upper Cambrian of Kashmir and the Salt Range of India.² Such reports were usually met with skepticism and suspicions of contamination.

However, in 1953 Krychtofowitch reported the discovery of lycopodiaceous shoots in the Cam-

*Wilbert Rusch Sr., is Professor of Biology, Concordia Junior College, Ann Arbor, Michigan.

brian of East-Siberia. In addition, various workers report the findings of small fragments of tracheids which show simple and bordered pits.

Agreement in Research Reports

Leclerq of the Department of Paleobotany at the University of Liege, Belgium, discusses these finds and others in an article "Evidence of Vascular Plants in the Cambrian."³ Although holding to the concept of evolution, he believes that the presence of vascular (woody) plants in the Cambrian seems established. Axelrod, of the University of California,⁴ agrees, pointing out that approximately 60 Cambrian spore genera are now on record.

Leclerq feels that these results definitely raise the question of the polyphyletic origin of the vascular plants. He also feels that the Psilophytales would seem to be eliminated from their usual position as the first land plants. The evidence for this rests not only on the Cambrian discoveries, but also the Silurian strata from Victoria, Australia, which have yielded vascular plant compressions associated with *Monograptus*, a graptolite.⁵ Axelrod concurs, as is evident, when he says that the plants of the continental interiors were more highly evolved than the contemporaneous psilophytes which lived near the shore of seas.

Leclerq also discusses the remarkable difference in the vegetation of the Lower Devonian compared to that of the Middle and Upper Devonian. The Upper Devonian shows preserved structures of pteridophytes such as Filicales and Calamitales (ferns and related forms) and gymnosperms such as Coniferales and Cordaitales (conifers and related forms) including some tree forms. The Middle Devonian also shows the same groups represented, but not in the tree-form. The Lower Devonian shows essentially herbaceous and semi-aquatic psilophyte-like as well as lepidodendroid forms. What Leclerq finds so astonishing is the marked discrepancy in the latter two flora so close together in time. He considers that the Lower Devonian were also present during Middle Devonian while Middle Devonian forms were present during Lower Devonian.

Relevance to Creation versus Evolution

What has all this to do with creation versus evolution? The Lower and Middle Devonian situations would seem to indicate that, due to the shortness of time sufficient to allow Lower Devonian flora to "evolve" into Middle Devonian, we have instead the following situation:

(a) a Lower Devonian flora, which may have existed also in the Middle Devonian, but this particular flora has not yet been found as fossils.

(b) Conversely, the Middle Devonian flora also existed in the Lower Devonian, but no fossils have been discovered.

The distinctness of the two flora may be due to a shift in environment, bringing into the area a new flora, already in existence in other like environments, but not previously found as fossils, rather than an evolution from one flora to another. This explanation may well be validly applied to other fossil sequences.

Austin Clark⁶ once wrote that on the basis of the fossil record, the creationist has all the better of the argument, since there is not the slightest evidence that any of the major groups arose from any other. He also has pointed out that this record does not support a tree of life, but rather presents the evolutionist with the necessity of explaining the development of a whole forest of trees (polyphyletic evolution).

This difficulty is not being eliminated, but rather amplified, hence the increasing appearance of the concept of polyphyletic evolution; and this concept is difficult to separate from creation with variation. It is to be noted that Leclerq in his article refers to the fact that the question of polyphyletic evolution is again raised by this new evidence. This would seem to support the persistence of types; as well as the sudden appearance of new types referred to at length by the German paleontologist, O. Kuhn.⁷

Furthermore, it is now legitimate to consider the existence of land animal forms, associated with these land plants, that might also have existed in the early Paleozoic, contrary to the present picture presented. Just as only fragmentary microfossils of land plants remain, so the animal remains would also either be absent or so small as to be unrecognizable as such.

Most of the early Paleozoic sedimentary rocks are marine, not continental, and so we should expect very few records of land life to be preserved in them. While such records might once have been present in the non-marine deposits, most of these might have been eroded, and the record thus lost. But certainly it should be clear that the reconstruction of biofacies presented in so many texts and museum displays as a complete representation of life at a given time may not really be completely representative at all, and thus be quite biased.

Conclusion

In conclusion, some of the new finds in the field of paleontology, rather than driving the last nail in the coffin of creation, would seem to continue to keep it alive as a viable alternate theory to that of evolution.

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SEED GERMINATION, SEA WATER, AND PLANT SURVIVAL IN THE GREAT FLOOD

GEORGE F. HOWE*

Seeds from the fruits of five different species and families of flowering plants were tested for germination after prolonged periods of soaking in sea water, fresh water, and mixed water baths. Seeds from three out of these five species germinated and grew after 140 days of soaking in each of the solutions mentioned.

The effect of the Genesis Flood upon seed plant life in general is discussed. Several means of plant survival both inside and outside the ark are evaluated. On the basis of present experiments and those of Charles Darwin, it is concluded that seeds from many plants may have resisted the direct contact of flood waters and germinated vigorously after the waters subsided from the surface of the earth. Several unanswered questions and areas for further study are enumerated.

Introduction

The topics of seed dormancy, germination, and growth have challenged the minds of botanists for many years. Several thorough articles and monographs on these topics provide information about the longevity,¹ preservation,² and metabolism,³ of seeds. Some of these references and certainly the paper by Ungar⁴ provide information about the effect of salts in the soil water at time of germination. Boyko has investigated the use of salt water as a source for irrigation^{5,6}.

None of the above studies has dealt specifically with the effect of soaking during storage on the survival of seeds. Since this topic is of interest from the standpoint of experimental plant physiology and also from the vantage of seed germination after the flood recorded in Genesis, the present investigation was undertaken to determine some of the effects of previous soaking upon germination of the seeds. Charles Darwin studied this problem of soaking and floating seeds in order to determine how plants might have traveled across large stretches of ocean water.⁷

Materials and Methods

Fresh fruits containing seeds of the five following different plants (from five different families) used in these studies were collected in weedy fields surrounding Westmont College, Santa Barbara, California in late June, 1967: *Raphanus sativus* L. (Brassicaceae or mustard family), *Rumex crispus* L. (Polygonaceae or buckwheat family), *Cirsium edule* Nutt. (Asteraceae or sunflower family), *Medicago hispida* Gaertn. (Fabaceae or legume family), and *Malva parviflora* L. (Malvaceae or hollyhock family).

All the specimens collected were dry and apparently ripe fruits from the current growing season (December through March, 1967). Fruit types involved were indehiscent silique (*Raphanus*), achenes (*Rumex* and *Cirsium*), legume (*Medicago*), and shizocarp (*Malva*). Taxonomic verification was conducted by the author, using Jepson⁸ for genus and species and Porter⁹ for family.

On June 24, 1967, fruits of each species were divided into four groups and treated as follows: (1) control fruits stored dry in paper sacs, (2) fruits soaked in sea water, (3) fruits soaked in sea water mixed with tap water, and (4) fruits soaked in tap water. Soaking baths were changed about every fourth day to prevent stag-

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nation, microbial bloom, or gross changes in saline content.

Sea water for soaking was collected fresh from the Pacific Ocean about every 4 days in a 20 liter bottle, along the beaches of Santa Barbara. The city water of Montecito, California was used to supply the tap water treatment. Approximately 10 liters of fresh sea water were mixed every fourth day with 10 liters of the tap water to provide a "mixed" soaking bath for each species tested.

Fruits were floated in shallow plastic containers holding about 2 liters in the case of *Rumex*, 1 liter for *Malva* and *Medicago*, and about 4 liters for *Raphanus* and *Cirsium*. Floating and soaking of these fruits in the liquids mentioned was performed in a glasshouse. No temperature control was provided during either the soaking or germination phases of this work.

At the beginning of the experiment, fruits of all the species floated for several days, as reported also by Darwin.¹⁰ By the end of the second week, however, nearly all fruits except those of *Cirsium* had sunken to the bottom of the liquids in the shallow storage pans, where they remained submerged throughout the rest of the soaking period. The *Cirsium* fruiting heads floated throughout the entire period of soaking.

Soaking began on June 24 and continued until November 11, 1967, a period of exactly 20 weeks or 140 days which corresponded roughly to the 150 day period in which water prevailed upon the earth during the Great Flood (see Genesis chapters 7 and 8).

At intervals of 4, 8, 12, 16, and 20 weeks after June 24, seed samples of the various plant species were removed from the several treatments and placed under conditions favorable for germination. Seeds selected for a germination study were removed from the fruit and counted before planting. Most germination tests were performed in 4-inch clay pots containing a soil mixture of sand, local clay soil, and peat moss blended in proportion of 1:2:1 respectively.

Ten seeds selected for a particular germination analysis were sown in a pattern as shown in Figure 1, to a depth of $\frac{1}{2}$ inch for *Cirsium* and about $\frac{1}{4}$ inch for all other species. Soil pots were subsequently watered with tap water during the germination tests.

Since the soil was not sterilized, there remained the possibility of volunteer seed growth within the experimental pots, since the species studied are all common weedy plants of Southern California. The geometry of sowing noted in Figure 1 allowed for easy distinction between the experimental seeds and "volunteer" seedlings of the same or other species. Actually only two of the test species had volunteers in the

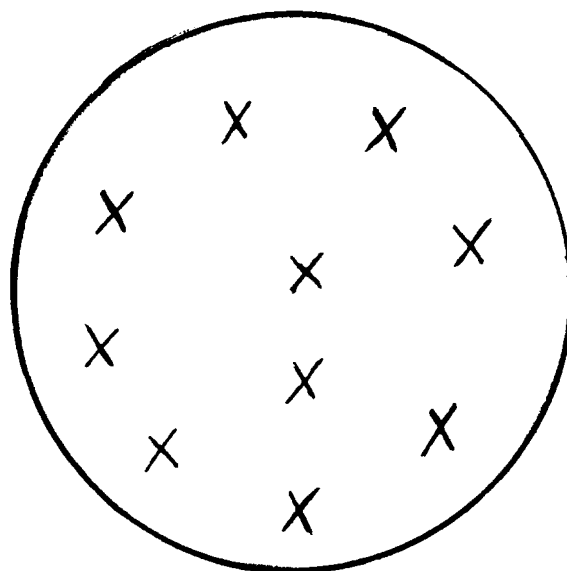


Figure 1. Surface view of a pot as used in germination trials. Each "X" indicates the position in which one seed was planted. This planting pattern enabled one to distinguish clearly between experimental seeds that had been planted and any volunteers present accidentally in the soil.

other treatments: *Malva parviflora* and *Rumex crispus*.

In the case of the *Rumex* germination studies, most tests were carried out in tap water contained in 50 ml beakers rather than in the soil pots mentioned. The seeds of *Rumex* germinated well this way and were completely visible, so that all possibility of volunteers affecting the *Rumex* count was removed. In the trials of the 16th and 20th weeks, separate observations were made on the germination of *Malva* and *Rumex* seeds in beakers of tap water and in soil-pots. The results of these parallel studies are included in Tables IV and V.

Since the two sets of data concur quite closely, it is evident that the problem of volunteer seedlings was minimal even among those two species which had some volunteer germination from the natural soil. On the basis of the position analysis of planted seeds and on parallel germination trials within beakers or pots, it can be inferred safely that these data represent actual germination of the experimental seeds.

Observations on each germination trial were made for several weeks after planting. Seeds in the soil were scored as "germinated" if the cotyledons emerged and expanded. Although a few of the *Medicago* seedlings later showed signs of "damping off" in one experiment, they were still scored as "germinated." Some of the *Rumex* seedlings, however, that were germinated by soaking in water, grew a root but did not unfurl the cotyledons or cast off the fruit wall

TABLE I—Week 4 (28 days of soaking)

Planting date: July 22			Data recorded for: 44 days
Seeds	Storage	Scarification	Soil-pot Results No. Seeds Germinating out of 10
<i>Raphanus sativus</i>	Control	_____	3
" "	Sea water	_____	5
" "	Mixed water	_____	8
" "	Tap water	_____	6
<i>Rumex crispus</i>	Control	_____	6
" "	Sea water	_____	8
" "	Mixed water	_____	9
" "	Tap water	_____	Grew in soaking bath.
<i>Cirsium edule</i>	Control	cut	4
" "	Sea water	cut	2
" "	Mixed water	cut	0
" "	Tap water	cut	1
" "	Control	_____	0
<i>Medicago hispida</i>	Control	cut	10
" "	Sea water	cut	10
" "	Mixed water	cut	9
" "	Tap water	cut	8
" "	Control	_____	0
<i>Malva parviflora</i>	Control	cut	8
" "	Sea water	cut	1
" "	Mixed water	cut	1
" "	Tap water	cut	2
" "	Control	_____	0

and such seedlings were not considered as "germinated," despite their root growth.

Early germination trials indicated that controls of *Medicago*, *Malva*, and *Cirsium* showed little or no germination. It was obvious that some dormancy mechanism prevailed in these three types.

It was discovered that these same three species would germinate readily if the seed coats were first cut tangentially with a razor blade before the germination trials were begun. Cutting was performed on the back of the seed to avoid injury to the radical or the epicotyl. It will be noted accordingly in the tables that seed coats of various lots were routinely scarified by cutting to break the seed-coat dormancy.

Furthermore, control seeds of *Medicago* and *Cirsium* germinated if they were soaked for about 10 minutes in concentrated sulfuric acid prior to planting. No cutting or acid scarification was attempted on seeds of *Rumex* or *Raphanus* because control seeds of these two species germinated readily. The whole fascinating topic of seed-coat dormancy has been reviewed adequately in various plant physiology text books.

Results

Data on the germination of various seed aliquots after 4, 8, 12, 16, and 20 weeks of soak-

ing are presented in Tables I-V. Each table indicates time after soaking period began, the exact starting date for the germination study, and the number of days during which germination data were recorded after planting the seeds or placing them in beakers.

Listed opposite each species is the soaking storage treatment, the scarification procedure (if any), and the number of seeds germinating out of 10. Tables IV and V also provide the results of both soil-pot and beaker germination trials in freshwater, as indicated earlier.

Throughout these tables the phrase "grew in soaking bath" appears opposite those *Rumex* fruits stored in tap water. This indicates that seeds of *Rumex crispus* germinated while they were soaking in the fresh water storage bowl, and continued to grow well until about the 16th week at which time they became heavily covered with algae.

It can be concluded that *Rumex* seeds in fresh water will germinate and grow for long periods of time. After resting upon moist soil, it is conceivable that these seedlings would survive and become established. This germination of *Rumex* seeds even while they are soaking in water may contribute to the growth and survival of the species in swampy or otherwise moist situations.

TABLE II—Week 8 (56 days of soaking)

Planting date: August 19			Data recorded for: 29 days
Seeds	Storage	Scarification	Soil-pot Results No. Seeds Germinating out of 10
<i>Raphanus sativus</i>	Control	_____	8
" "	Sea water	_____	1
" "	Mixed water	_____	5
" "	Tap water	_____	6
<i>Rumex crispus</i>	Control	_____	7
" "	Sea water	_____	3
" "	Mixed water	_____	4
" "	Tap water	_____	Grew in soaking bath.
<i>Cirsium edule</i>	Control	cut	10
" "	Sea water	cut	0
" "	Mixed water	cut	0
" "	Tap water	cut	0
<i>Medicago hispida</i>	Control	cut	10
" "	Sea water	cut	8
" "	Mixed water	cut	10
" "	Tap water	cut	6
<i>Malva parviflora</i>	Control	cut	4
" "	Sea water	cut	7
" "	Mixed water	cut	9
" "	Tap water	cut	2

TABLE III—Week 12 (84 days of soaking)

Planting date: September 16			Data recorded for: 31 days
Seeds	Storage	Scarification	Soil-pot Results No. Seeds Germinating out of 10
<i>Raphanus sativus</i>	Control	_____	10
" "	Sea water	_____	0
" "	Mixed water	_____	3
" "	Tap water	_____	2
<i>Rumex crispus</i>	Control	_____	9
" "	Sea water	_____	3
" "	Mixed water	_____	8
" "	Tap water	_____	Grew in soaking bath
<i>Cirsium edule</i>	Control	cut	9
" "	Sea water	cut	0
" "	Mixed water	cut	0
" "	Tap water	cut	0
<i>Medicago hispida</i>	Control	cut	8
" "	Sea water	cut	8
" "	Mixed water	cut	7
" "	Tap water	cut	10
<i>Malva parviflora</i>	Control	cut	6
" "	Sea water	cut	4
" "	Mixed water	cut	8
" "	Tap water	cut	4

TABLE IV—Week 16 (112 days of soaking)

Planting date: October 14			Data Recorded for: 24 days	
Seeds	Storage	Scarification	No. of Seeds Germinating out of 10	
			Soil-pot Results	Beaker Results
<i>Raphanus sativus</i>	Control	_____	9	_____
" "	Sea water	_____	0	_____
" "	Mixed water	_____	0	_____
" "	Tap water	_____	5	_____
<i>Rumex crispus</i>	Control	_____	7	10
" "	Sea water	_____	4	10
" "	Mixed water	_____	2	6
" "	Tap water	_____	Grew in the soaking bath	
<i>Cirsium edule</i>	Control	cut	8	_____
" "	Sea water	cut	0	_____
" "	Mixed water	cut	0	_____
" "	Tap water	cut	0	_____
<i>Medicago hispida</i>	Control	cut	8	10
" "	Sea water	cut	10	10
" "	Mixed water	cut	10	10
" "	Tap water	cut	10	10
<i>Malva parviflora</i>	Control	cut	3	4
" "	Sea water	cut	3	9
" "	Mixed water	cut	5	9
" "	Tap water	cut	6	5

TABLE V--Week 20 (140 days of soaking)

Planting date: November 11			Data recorded for: 22 days	
Seeds	Storage	Scarification	No. of Seeds Germinating out of 10	
			Soil-pot Results	Beaker Results
<i>Raphanus sativus</i>	Control	_____	9	_____
" "	Sea water	_____	0	_____
" "	Mixed water	_____	0	_____
" "	Tap water	_____	3	_____
<i>Rumex crispus</i>	Control	_____	6	2
" "	Sea water	_____	7	2
" "	Mixed water	_____	2	7
" "	Tap water	_____	Grew in the soaking bath	
<i>Cirsium edule</i>	Control	cut	10	_____
" "	Sea water	cut	0	_____
" "	Mixed water	cut	0	_____
" "	Tap water	cut	0	_____
<i>Medicago hispida</i>	Control	cut	10	_____
" "	Sea water	cut	10	_____
" "	Mixed water	cut	10	_____
" "	Tap water	cut	10	_____
<i>Malva parviflora</i>	Control	cut	5	6
" "	Sea water	cut	7	10
" "	Mixed water	cut	6	9
" "	Tap water	cut	9	4
				(fungus present)

After 4 weeks of soaking in sea, tap, or mixed water, seeds of all species tested showed at least some germination (with the one exception of *Cirsium* in the mixed soaking bath).

After 8 weeks it is apparent that *Rumex crispus*, *Raphanus sativus*, *Medicago hispida*, and *Malva parviflora* seeds from all soaking treatments germinated. Seeds from *Cirsium edule* taken from the sea, tap, or mixed water storage did not germinate.

After 12 weeks of soaking, germination results were similar to the 8 week data excepting that seeds of *Raphanus sativus* stored in sea water did not germinate.

After 16 weeks of soaking in sea water, tap water, or mixed water treatments, seeds of *Rumex crispus*, *Medicago hispida*, and *Malva parviflora* germinated well. It is seen finally in Table V, that after 140 days of soaking in the three storage treatments, seeds of *Rumex crispus*, *Medicago hispida*, and *Malva parviflora* germinated well in the soil-pot trials (and in the beaker tests where indicated.) Thus seeds from three out of the five weedy species randomly selected germinated and grew after seven weeks of soaking in sea, tap, or mixed water.

These data indicate that there is widespread resistance to salt or fresh water soaking among the seeds of flowering plants. Such resistance may be at least partially attributable to seed-coat dormancy in the case of *Malva parviflora* or *Medicago hispida*, but is also evident in *Rumex crispus* where no such dormancy exists.

Discussion

Cells of many plants require a high concentration of oxygen to maintain their metabolism.¹¹ Many land plants die when a region is subjected to prolonged flooding. Dead trees are often visible in the waters of man-made lakes where the roots have died from suffocation before the whole tree or shrub perished. Death in such instances is apparently caused by oxygen deficiency, and can also be noted in "water-logged" soils or overly watered potted plants.

The high oxygen requirement of many land plants presents an apparent problem to the concept of a total flood during the days of Noah. Possible survival mechanisms for various kinds of plants will be examined presently in the light of the Bible narrative.

Much destruction of plant life would have been expected in a global flood. Extinction of many species would be a predictive consequence. Reference to any standard text in Paleobotany will demonstrate that numerous kinds of plants found in fossil beds are not known on earth today.

Whole groups such as the Calamites, Cordaitales, Cycadofilicales, Bennettitales, and the Caytoniales have vanished—to mention just a few. It is of course impossible to know with absolute scientific certainty if some of these plants became extinct before the flood or if they were all destroyed by it.

Evidence does suggest, however, a much richer flora in time past and great extinctions among the fossil plants. Extinction of many species is exactly what one would predict if there had been a great flood. The first suggestion in answer to the problem of plant survival during the world-wide flood is that many plants did not survive!

The record of the flood (Genesis 6-9) contains much detail concerning provisions for animal survival. Although no mention is made of similar activity for preservation of plants, it is entirely probable that Noah and his family stored seeds or other propagules of important crop plants on the ark. If this conjecture is probable, then an interesting suggestion arises about crop plants and centers of ancient civilization.

Edgar Anderson and numerous other workers report that crop plants originated historically at ancient centers of human culture. Thus oranges, tea, and rice came from China; maize from the American Indians; and various cereal grains and fruit crops from the Indo-European area. It is at least possible that valuable plants stored on the ark were preserved by the children of Noah. If certain economic plants were cherished by the different races, one would expect to find important crop plants coming from the several centers of post-flood civilization. Although this idea is admittedly speculative, it does inject an interesting answer to the unsolved problem of crop plant origin.

The ark itself no doubt served to preserve the seeds of some species of plants either on the fur of animals or as various foods provided for them.

Sir Charles Darwin reported that trees floating in the ocean can contain seeds that will germinate:

I find that when irregularly shaped stones are embedded in the roots of trees, small parcels of earth are frequently enclosed in their interstices and behind them,—so perfectly that not a particle could be washed away during the longest transport: out of one small portion of earth thus completely enclosed by the roots of an oak about 50 years old, three dicotyledonous plants germinated: I am certain of the accuracy of this observation.¹²

This mechanism in itself may have provided for survival of seeds from many plants during the flood.

Darwin stressed the role of icebergs in transporting plant propagules, a phenomenon which also may have contributed to endurance of seeds or other plant parts in the flood:

As icebergs are known to be sometimes loaded with earth and stones, and have even carried brushwood, bones, and the nest of a land-bird, it can hardly be doubted that they must occasionally, as suggested by Lyell, have transported seeds from one part to another of the arctic and antarctic regions; and during the Glacial period from one part of the now temperate regions to another.¹³

Darwin discovered that seeds contained in dead bodies would readily germinate and grow after the carcasses had been floated in salt water:

Again, I can show that the carcasses of birds, when floating on the sea, sometimes escape being immediately devoured: and many kinds of seeds in the crops of floating birds long retain their vitality: peas and vetches, for instance, are killed by even a few days' immersion in sea-water; but some taken out of the crop of a pigeon, which had floated on artificial sea-water for 30 days, to my surprise nearly all germinated.¹⁴

Carcasses of animals strewn upon the surface after the Flood may have contained seeds which eventually germinated.

Finally, the results of this present study indicate that seeds of certain plants will grow after soaking for as long as 140 days in various water baths. It may be argued that the Flood waters were almost as salty as our ocean waters of today, or it may be possible that they had a far lower saline content. In either case, the data of my study demonstrate that three out of five species tested germinated after long soaking periods in sea, mixed, or tap water.

Darwin also experimented with survival of flowering plant seeds after floating the fruits upon a salt-water solution:

Until I tried, with Mr. Berkeley's aid, a few experiments, it was not even known how far seeds could resist the injurious action of sea-water. To my surprise I found that out of 87 kinds, 64 germinated after an immersion of 28 days, and a few survived an immersion of 137 days.¹⁵

Altogether, out of the 94 dried plants, 18 floated for above 28 days; and some of the 18 floated for a very much longer period. So that as 64/87 kinds of seeds germinated after an immersion of 28 days; and as 18/94 distinct species with ripe fruit (but not all the same

species as in the foregoing experiment) floated, after being dried, for above 28 days, we may conclude, as far as anything can be inferred from these scanty facts, that the seeds of 14/100 kinds of plants of any country might be floated by sea-currents during 28 days, and would retain their power of germination.¹⁶

Oddly enough, Darwin concluded that legume family members survived the effects of salt water badly and would not germinate after soaking:

It deserves notice that certain orders were far more injured than others: nine Leguminosae were tried, and with one exception, they resisted the salt-water badly; . . .¹⁷

This negative result may be explained by the fact that many legume type plants require scarification (cutting or acid treatment) to break their seed-coat dormancy. Perhaps Darwin would have noted better germination of soaked legume members had he understood this scarification requirement. In my experiments, it is evident that the legume (*Medicago hispida*) germinated quite well with scarification after 140 days of soaking in any of the water solutions.

Since plant species are so often limited to relatively small geographic areas, as for example, many California species of *Ceanothus*, it would seem that mostly plants survived the Flood by resistance of either the seed or plant parts to salt water. Extensive experimentation as regards survival of *Ceanothus* seeds, cuttings, and even parts of the plant with roots attached, would no doubt give us much insight on this survival problem.

From these data and from Darwin's it may be concluded that seeds of many flowering plants could have resisted the direct contact of flood waters and germinated vigorously after the Flood. Thus seed plant survival during the Flood may have occurred by many means—both inside and outside the ark.

Several questions remain as yet unanswered. More studies are needed to find how widespread this resistance to prolonged soaking may be among seeds of flowering plants. It would be of interest to investigate factors which prevent germination and growth of *Raphanus sativus* and *Cirsium edule* seeds after soaking.

The Bible indicated that a dove released by Noah returned with an olive leaf in its mouth. How much soaking in salt or other water solutions would an olive plant be able to resist and still propagate afterwards?

These and other projects might provide data which would be of value in experimental plant physiology and in the understanding of Bible history.

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UNIVERSITIES AND COLLEGES HAVING THE CREATION POINT OF VIEW

WALTER E. LAMMERTS*

Cedarville College was established by the Reformed Presbyterian Church in 1887. Then, as now, it was believed that "education without morality is a menace to the state . . . accordingly the Bible is the textbook of the college." In 1953 the operation of the college was transferred to the trustees of the Baptist Bible Institute of Cleveland; it is now an approved school of the General Association of Regular Baptist Churches.

The scenic 100 acre campus is in the rural community of Cedarville, Ohio, near the large metropolitan areas of Columbus, Cincinnati, and Dayton.



Figure 1. An interior view of the Library.

Present enrollment is about 850 students, and most of the men and women live in student residence halls. For example Maddox Hall very comfortably houses 220 women, usually eight students to a unit consisting of bedroom area, study lounge and rest-room. All students under 25 years of age must live in college-owned or approved residence quarters, unless living at home.

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Basic costs including tuition, board and room, total about \$2,000 for an academic year of three quarters. Scholarships are available to students who have demonstrated academic ability and definite financial need. There are also many opportunities, both on the campus and in the metropolitan areas, for part-time work.

Of particular interest to our society is the doctrinal statement of Cedarville College, paragraph 4 of which reads: "We believe in the literal account of creation and that the Scriptures clearly and distinctly teach that the creation of man lies in the special, immediate, and formative acts of God." Man's subsequent fall into sin and his salvation by faith in Jesus Christ as the Son of God, who physically arose from the dead, and ascended into heaven are also included in the detailed 14-point statement of belief.

Dr. Donald P. Baumann, Ph.D. 1962, Iowa State University, is head of the division of Science and Mathematics. He is professor of bacteriology and chemistry. Assisting him are associate professors Austin D. Elmore, biological science, especially botany; L. Bert Frye, physical sciences and Daniel E. Wetzel, physics and mathematics. Dr. Larry Helmick has recently



Figure 2. Dr. Donald Baumann in one of the laboratories.

joined the faculty as assistant professor of chemistry and Mr. Larry Killian as assistant professor of biology. Malcolm D. Woodard is instructor in mathematics.

Students may obtain a bachelor of arts degree in either biology, mathematics, or chemistry. A minor is available in physics. Stated aims of this division are also particularly interesting to our society:

This division aims to acquaint the student with the field of science and aid him in developing clear and orderly thinking processes through the use of the techniques of science and mathematics. The division seeks to help the student appreciate the facts of creation, as

studied in the physical and natural sciences. Such an appreciation is vital to a complete Christian view of the world we live in.

Included in the biological science courses offered are genetics, micro-technique, histology, general botany, study of local flora, plant anatomy, taxonomy of seed plants, introductory and advanced bacteriology and of course, biology, comparative anatomy, and embryology.

Cedarville graduates have been admitted to many university graduate schools without penalty. The college is working toward regional accreditation and currently holds state approval for both elementary and secondary teacher training.

COMMENTS ON SCIENTIFIC NEWS AND VIEWS

HAROLD ARMSTRONG*

Life Not Reducible to Physics, Chemistry

M. Polanyi¹ has written on "Life Transcending Physics and Chemistry." His main point is that the theses: "living beings are to be considered as mechanisms," and "life is to be accounted for by the laws of physics and chemistry," far from being different ways of saying the same thing are actually incompatible.

Even an inanimate mechanism, a machine, is not accounted for by the laws of physics and chemistry (consistent with, yes; but accounted for by, no). Much more is it accounted for by the law which its designer imposed on it, and this is outside the realm of physics and chemistry.

In fact, Polanyi points out, nothing is determined by the laws of chemistry and physics themselves; it is always the laws plus the initial, or boundary conditions, and the determination of these conditions lies outside the realm of physics and chemistry. Again, the essence of a machine, or of a living being, lies in, (or at least involves) its function, and the function is not a matter of physics and chemistry.

The article reads something like Aristotle returned to these times. There is his emphasis on function and essence, the contrast of form and matter, and many such points.

Current attempts to reduce life to a particular reaction or operation in physics and chemistry may not be as objectionable to us, as Christians, as some other popular notions are. Yet we shall scarcely have much liking for them.

While the Nicene Creed, in calling the Holy Ghost "the lord and giver of life," may not be quoting Scripture directly, yet it is surely in

accord with Scripture. There is something God-like about life, for ". . . God . . . breathed into his nostrils the breath of life, and man became a living soul." And thus anything which belittles life is likely to end up belittling God.

I appreciate Dr. John Moore's calling this article to my attention. (Editor's Note: Readers also might wish to consult "The Unity of the Organization" by W. R. Thompson, *The Modern Schoolman*, 24:125-157, March, 1947.)

On the Development of Corn

M. D. W. Jeffreys² has presented strong evidence to show that maize was cultivated in South Africa before Columbus' time. He proposes, on the evidence of the words for maize in the native languages, that it may have come through the Arabs to the north.

How maize got to Africa from America at all he does not consider.

Since there is no wild maize, it has been supposed that it was developed from a wild kind of pod corn. There are difficulties here: the pod corn seems a very unpromising thing for people to start cultivating, and to persist in cultivating and developing for many generations.

Is it possible that the truth is the opposite: that the pod corn is a *degenerate* variety of maize gone wild? Anyone has seen maize with kernels on the tassels; if this were let go to seed might it not at length produce a degenerate wild variety?

If, as is commonly supposed, maize started in America, it is hard to see how it crossed the ocean before Columbus. Can a Creationist offer a suggestion here?

Suppose that maize was cultivated after the flood, by the people spreading out from Mt. Ararat. A few, perhaps with maize for pro-

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visions, spread as far as what is now America, and were isolated there when the world was divided in Peleg's time.

In Asia, Europe, and northern Africa, maize lost popularity and died out; or maybe there was a plague, just as elms are now dying out in North America. But southern Africa, and, of course, America, were isolated, so it continued there.

Incidentally, is it not likely to be a waste of time inquiring how maize got from northern to southern Africa, when the answer to the big question—how it got to Africa at all, is ignored? For the answer to the big question may very likely make the answer proposed to the small question absurd.

While evolution is not particularly concerned here, the same thing is true of evolutionary discussions: much effort is put into getting small (alleged) answers, which are likely to become useless when the big question is answered.

Redundancy and Survival

A speech by Dr. V. C. Abrahams is reported³ in which he remarked, (and this has apparently been known for some time) that if one part of the brain should be damaged, another part can take over. A man, for instance, who lost half of his brain during the war was later able to attend Oxford, and is now occupied in electronics.

It is very puzzling to see how this redundancy could have "evolved." Under primitive conditions, a man or an animal who suffered injuries severe enough to damage the brain would die almost immediately. The injured would not have any more descendants. Thus there would be no especial reason why any special redundancy of brain which he might have should be passed on and developed.

So here is a feature which one can hardly believe to have arisen by accident, and for which "survival of the fittest" clearly offers no explanation. (Come to think of it, does it offer an explanation of anything? For if by "fittest" is meant those who survive, it is just a tautology. But what other way is there of judging what is fittest, seeing that many creatures which, did we not know the facts, we should judge to be quite unfit, yet survive and prosper.)

On Imagined Origins

The theory of evolution claims to be a theory of origins; to tell us how horses, e.g., originated. Now there is no way of checking anything that may be said about these origins, at least there is none for anyone who will not accept the authority of Scripture.

But there are origins about which we know directly; such are the origins of inventions, works

of art, etc. If people, who did not know the facts beforehand, were to try to think of the origin of the linotype, by looking at it and at other equipment for printing, it might be interesting to see how right or how wrong they would be.

As far as I know, such an investigation in terms of inventions has never been made. But we do have a little information about people's success—or lack thereof—in finding the origins of works of literature.

C. S. Lewis tells us that:

I have watched reviewers reconstructing the genesis of my own books . . . reviewers . . . will dash you off . . . histories with great confidence, will tell you what public events had directed the author's mind to this or that . . . my impression is that in the whole of my experience not one of these guesses has on any one point been right; that the method shows a record of 100 percent failure . . . yet they would often sound—if you didn't know the truth—extremely convincing. Many reviewers said that the ring in Tolkien's "The Lord of the Rings" was suggested by the atom bomb . . . in fact, the chronology of the book's composition makes the theory impossible . . . the results are either always, or else nearly always, wrong. The assured results of modern scholarship as to the way in which an old book was written are assured . . . only because the men who knew the facts are dead . . .⁴

Yet anyone has some idea as to how he would go about writing a book, but no idea at all as to how he would go about creating a horse. If, then, men's conjectures about the genesis of books are wrong, what faith can we put in their conjectures about the genesis of the horse?

Evolution: Theory or Myth?

If we can find that a theory, considered to be a scientific one, existed in people's imagination before it was believed on the authority of (real or apparent) evidence, we have grounds for some doubt, or, at least, extremely careful scrutiny, of the theory. For we know that it is only too easy to see any facts as evidence for what we want to believe.

C. S. Lewis⁵ (who was not particularly an enemy of Darwinian evolution) has pointed out that evolution is in this position. For the doctrine (if it can be called a doctrine, rather than a vague feeling): "Things change and change is improvement," can be found forty years or so earlier than the *Origin of the Species*, in such poetical works as Keats' "Hyperion" and Wagner's "Nibelung's Ring."

Lewis distinguished between the scientific theory (and to call it that is not to say that it

is necessarily true), and the vague feeling, which he called a myth. It is worth noticing that, even since he wrote, the myth has encroached on the scientific theory.

The latter, he remarked, "... does not in itself explain the origin of organic life, nor of the variations, nor ... of reason. Still less does it even attempt to tell you how the universe as a whole arose ... " But today we see what is presented as a serious scientific theory to "explain" all these things. Yet, there is no more conclusive evidence on such questions now, than there was when Lewis wrote.

He believed that the myth, so far as it was a myth, was already declining, but that reasons (having nothing to do with science) remained for its popularity. For everyone could think that he had seen evolution, e.g., a tree developing from an acorn; forgetting, of course, that the acorn in turn came from a tree.

Again, the myth naturally appeals to the young, or those who want to think themselves young, by providing an excuse for irreverence to age. Also, the myth, by encouraging "planned obsolescence" pleases those who want to sell us things, and, finally, it is implicit in present-day politics, with its view that change is necessarily good.

Even though the heyday of the myth is past, it must be noticed that, in many cases, it is the myth with which our children are being brain-washed in school or elsewhere. Thus the need of opposition, of refutation, is even greater than if we were concerned with a strictly scientific theory. No teacher would present the Greek myths as sober ancient history; why should anyone present the evolutionary myth as sober science?

Symbiosis Explained by Chance?

Symbiosis, the living together of creatures of different kinds, has always been one of the difficulties for the theory of evolution. For even if it were always to the mutual advantage of both partners, it still has to be explained how both came simultaneously to adapt themselves to the partnership.

But, in fact, it is not always even mutually beneficial as far as we can tell. Sometimes the partnership is positively detrimental to one of the partners; or, perhaps, any advantage may be very minor indeed.

This is true when two different kinds of creature are concerned. What, then, are we to think of a sort of symbiosis within a man's body?

Dr. Riojun Kinoshita, of the City of Hope Medical Centre (apparently at Duarte, California), has reported that the macrophages, a type of white blood cell, work in cooperation with the other white cells, the lymphocytes: "... mac-

rophages trap and analyse disease-causing material invading the body, then send instructions to ... the lymphocytes, to multiply and make antibodies specifically designed to destroy the invader."⁶

Is it seriously to be maintained that such an arrangement "evolved?" That, perhaps, in some body ages ago, a few macrophages appeared by chance, and by chance began to work with the lymphocytes? And that the lymphocytes, somehow, by chance became disposed to attend to the instructions given to them? Could anything be more unlikely?

During the war, I was an artilleryman. Usually, the men who fire the guns cannot see the targets. Somewhere, up front, is an observation post. The observers can see the target, and instruct the guns to fire at such and such a range, and in such and such a direction. Is this not rather like the cooperation of the macrophages and the lymphocytes?

Now who would maintain that the observation post, and the battery of guns, came about by chance, and began to cooperate by chance? Certainly I should not, especially to my old sergeant-major!

Unique Insect Lenses

It has been found⁷ that certain insects, of kinds which are active at night, e.g. night moths, have the lenses of their eyes covered with a regular pattern of raised bumps: "nipples." Insects active in the day have none. Dimensions of the nipples are about one third of a wavelength of light; thus they could not be seen well with a microscope, and in fact, were discovered by electron microscopy.

It seems, and this idea was tested with an analogue using microwaves and thus on a larger scale, that the effect of the nipples is to give a gradual transition of index of refraction, from that of air to that of the material of the lens. Now this has two effects: it improves the transmission of light somewhat, and it cuts down reflection very much.

The same purposes are accomplished in applied optics; coated lenses in binoculars improve the transmission of light, and thus the seeing; and "non-reflecting" windows are fairly common in fancy stores.

But our way of doing this is more crude. We can not have the index of refraction vary continuously, so we put on the glass a layer, of suitable thickness, of material whose index is intermediate between that of air and that of the glass. This serves the purpose fairly well.

Lack of reflection would serve the insect by helping to camouflage it at night. In the article a half-hearted attempt is made to relate this

to evolution. But it would seem, like other things which must be perfect before they are of any use at all, to make trouble for that theory.

The nipples must be in a perfect array before they are of any optical advantage: an imperfect array would be a disadvantage. So it makes no sense to say that some insect, which developed a few nipples by chance, was more "fit"; it would have been less fit.

Incidentally, since we have referred to optics and microwaves, we might ask a microwave or optical engineer whether he could get a good system by trying things at random. But I should fear to ask him; his answer would be: "Don't waste my time with such foolishness. You would never get anywhere that way; you have to have a design—a plan—for what you are doing."

But we know that there is a design, and we know the Designer. What He did, some thousands of years ago, the microwave and optical engineers have just now learned to do. Long ago, King Solomon advised: "Go to the ant, thou sluggard." It would seem also to be good advice to say: "Go to the insect, thou engineer."

Birds and Intelligence

It has often been supposed that birds are not very intelligent, but do whatever they do by instinct. (Whatever that really means.)

A recent article, however, reports tests, supposed to test intelligence, in which several kinds of birds did quite well.⁸ Pigeons and chickens did better than any mammal except the primates, and chickens did better than marmosets.

This is interesting for several reasons. In the first place, if mammals are supposed to be farther "evolved" than birds, it would have to be admitted that their intelligence did not evolve along with them. In fact, though, they were all created, with their own peculiarities and abilities.

Now birds, from the fact that they get around easily—and in three dimensions, what is more, not just two—meet a great variety of conditions and circumstances. Thus they have to be adaptable—which is practically what being intelligent means, as far as the tests are concerned—and so God, in His wisdom, made them so.

In the second place, birds' brains, and especially the cerebral cortex, commonly supposed to be especially important to intelligence, are tiny. So it appears that a fairly high level of intelligence can work with a considerable variety of equipment. Thus any attempt to relate intelligence to the shape of the skull, especially in the case of the alleged fossil men, must be considered as likely fallacious.

Tests suggested that the birds can have uni-

versal ideas, such as odd, even, number, shape, etc. Philosophers have debated this for a long time, often with little evidence. Some have feared that to allow too great mental powers to animals and birds would compromise man's status, and make things easier for evolution. I suggest that the fear is not well founded.

We know that we are far above inanimate objects. Somewhere in between are the animals. If they are closer to us than we had supposed, then perhaps it would have been easier for them to evolve toward us (if the impossible can be called "easier"), but then it would have been harder for the lifeless things to evolve toward the living.

So evolution, considered all-over, is in just as great difficulty no matter what the exact status of the animals. And if anyone wants not to consider it all-over, to say that the lower animals were created especially but man evolved or something of that sort, then the time is ripe for a wielding of Ockham's razor.

The fact is, surely, that God made man in His own image, but also He put something of His image into the other things which He made. If He chose to put into the animals rather more of His image than we had supposed, He did well, for everything that was created was very good.

Finally, it may be in order here to question all these tests of intelligence. The tests given to human beings, in schools and elsewhere, have recently been questioned; maybe the question should be extended. A joke may illustrate my point.

A visitor to the asylum noticed a patient pushing a wheelbarrow up-side-down. "Hey!", shouted the visitor, "Don't you know how to push a wheelbarrow?" "That's what I do know," replied the patient, "Yesterday I had it other-way-up and they kept putting stones into it."

Who was showing intelligence in this case? The tendency is to equate intelligence with adaptability, moreover, to our purposes. But what about creatures who are adaptable to their own purposes, or, it may be, to God's?

Nobody would say that we should call a handyman more intelligent than a philosopher, because he can do more things of immediate use to us. Why, then, should we judge the animals with a judgment which we will not apply to ourselves?

God made them with their various abilities and pronounced His work very good; can we not be content with His judgment?

More on Mathematical Challenge

We should give some consideration to the mathematical challenge to evolution; the arguments, by mathematicians, that some of the happenings supposed to have happened in evolution

are so unlikely that they simply can not be believed.

When the challenge was given, some evolutionists tried to find some rebuttal, but what was said was neither very interesting, nor very convincing. Later attempts at rebuttal seem not to have been any better.

One attempt, a while ago, was to the effect that, until the mathematicians could explain why the product of two negative numbers is positive, the evolutionists might be unconvinced by the demonstrations that evolution is highly unlikely.⁹ (To say the least.)

Really! Students beginning algebra are fascinated by such seeming oddities; later they see that the only reason is just the interpretation which is applied to the signs. If that is the best defense which can be given for evolution, our job should be an easy one!

Spreading Ocean Floor Interpreted

The notion that the floor of the ocean is spreading has been mentioned again in *Nature*,¹⁰ It seems to be believed that a ridge keeps rising in the floor of the ocean about the middle, and the floor keeps spreading out from this ridge.

As new material for the floor emerges, it is supposed to become magnetized, according to the direction of the earth's field at the time and place concerned. Thus there are strips of different magnetization, and these are considered to supply a scale of time.

It appears, the article says, that there was once a pause in this spreading. The evidence is largely a strip where sediment has collected more thickly than it would have done if the floor had always been spreading.

The pause (if "pause" be a suitable word; it is supposed to have lasted a long time) is said to have happened in the late Tertiary. There is some evidence, however, that there have been other pauses; and a characteristic that is especially interesting is that this pause seems to have happened about the same time in all the oceans of the world.

Some comments might be made. First of all, the dating by magnetization assumes that the magnetization was fixed when the material cooled below the Curie temperature. But is this really necessary? Might mechanical stresses and working not allow the magnetization to be varied, and later to be fixed? Everyone knows that if an iron bar is put in the north-south direction and pounded it becomes magnetized. Perhaps some experiments with other materials would be in order here.

As for the pause in the spreading, this sounds like another aspect that could have developed at the time of the flood. In fact, a universal

flood would seem to offer the easiest explanation for a universal effect.

Whatever be the details, it would seem that the actual observations, the bands of different magnetization and the ridges of sediment, could easily be caused by erosion and deposition of sediment during the flood, and the disturbances that happened when the present oceans were deepened and the continents rose.

Maybe it is time for a *systematic application* of flood geology to what is known about the floors of the oceans.

Studies of Basalt

A recent article¹¹ describes some studies of basalt from the bottom of the Pacific Ocean. The samples, from the vicinity of 35° S, 108° W, were tested for age by the method of potassium and argon. We have considered before, in this publication, some of the many errors which may creep into such tests, but, for whatever it may be worth, the results made the basalt less than one million years old.

The unexpected thing was that samples from different places gave about the same ages. On the theory of the spreading floor of the ocean, it might have been expected that samples would be youngest at the centre from which the floor is spreading, and older farther away. But there is no evidence of any such variation.

Here, as elsewhere, flood geology may help. Does it not seem likely that the basalt, which is so much like volcanic rock, may be a relic of the day when "the fountains of the great deep were broken up?"

If, as seems likely, the bottom of the Pacific has lain under water since the flood, it may well be in much the same condition as it was during the flood, while the dry land, of course, has been changed almost beyond recognition by erosion and such influences.

It may well be, thus, that careful consideration of some of these findings about the state of the bottom of the ocean will help us to see in more detail just what happened during the flood.

Even Humanity Denied

A recently published book, *The Naked Ape*, presents the doctrine that man is just that. May we say that, for our part, we shall remain unconvinced until an ape writes a book called *The Hairy Man*?

Really, though, what is one to make of such ravings? Dante, I believe, had in the *Inferno* a special place for those who had denied their immortality. It presumably never occurred to him that anyone would deny his humanity.

Incidentally, St. Thomas Aquinas, who was more or less contemporary with Dante, wrote that

. . . through ignorance of the nature of things, and, consequently, of his own place in the order of the universe, this rational creature, man, who by faith is led to God as his last end, believes that he is subject to other creatures to which he is in fact superior . . . this is true . . . generally of persons who hold any similar views derogatory to the dignity of man.¹²

Mutations and Atom Bomb

The matter of mutations may be elucidated somewhat by the studies reported in a recent letter.¹³ Investigation of children, at least one of whose parents had received at least 100 rads of radiation at Hiroshima or Nagasaki gave negative results; in fact “. . . no increased frequency of stillbirths, neonatal deaths or gross malformations . . . no overall increase in the mortality rate . . . the essentially negative findings suggest that no effect was produced . . .”

First of all, we may be glad that the result which some had feared, the appearance of many monsters, has not happened. But may we find something else?

These results seem to show that exposure to atomic radiation is not, among human beings at least and presumably among the higher animals, a cause of many appreciable mutations. So any hope of accounting for the existence of kinds by the mutation of other kinds, induced by radiation, is a forlorn one.

Not Theistic Evolutionists

It is sometimes supposed that the great philosophers of the medieval Church, St. Augustine and St. Thomas Aquinas, were in favour of some doctrine like theistic evolution, or at least would not have disagreed had anyone proposed such a doctrine in so many words.

It must be suspected that the purpose of such claims is to do these men what is considered a favour by ascribing a popular doctrine to them. To investigate the matter thoroughly would take some time, for both of these men wrote very much; but the following quotation, from St. Thomas Aquinas, may be of interest¹⁴

After the works of the six days of creation, none of the things subsequently made by God is so utterly new as not to be there anticipated in some way. Some things pre-exist materially, others casually as well, as the individuals that are now generated pre-existed in the first individuals of the species. Fresh kinds that may emerge are present in forces already at work—as animals of a new species are sometimes produced from the union of animals of different species, as a mule from an ass and a mare.

(Note: The pre-existence, of course, was potential. There is no question of a cell within a cell

within a cell to infinity, as some believed a hundred or so years ago.)

Is this not exactly the doctrine that we have maintained: creation of the kinds in the six days and limited variability within the kinds? Had Darwin only noticed it, this could have accounted for his finches, and he would never have had occasion to “fly in the face” of both evidence and revelation.

Problems of Saturn's Rings

H. Alfven has commented recently on the structure of Saturn's rings.¹⁵ He argues that the usual explanation of resonance with the satellites is inadequate, and, indeed, that it is unlikely that any force acting today could have caused the structure. He thinks that the rings, with their structure, were probably formed at the same time as the planet was.

There is a real question though, the article goes on to admit, whether such a structure could have survived the effects of various forces acting on it, if it really be hundreds of millions of years old.

The article makes another interesting point. The planets, and such asteroids as rotate about their axes, all have about the same period, viz: about one day, unless they have obviously been changed by tidal effects. This could hardly be by chance.

Again, it is suggested, it must have been that way from the beginning. But then again, it is necessary to ask whether it is reasonable to suppose that the periods would have stayed the same through untold ages.

Here again, the belief that the universe is young avoids much trouble. If it pleased God to create an elaborate ring for Saturn, and to set many of the planets rotating at about the same rate, it certainly was well within His power to do so. And if they have had to last only about six thousand years, it is not very strange that they are “as good as new.”

Cells from Cells from Cells . . .

A report of some remarks by D. L. Nanney, at a meeting earlier this year of the American Society for Cell Biology, at Denver, seems worth noticing. He said, in part:

. . . nowadays cells are not made (according to” a nuclear genetic blueprint) and probably no cell has ever been made this way. Cells are made by pre-existing cells . . . essential biological information is encoded and transmitted by cellular material other than genes.¹⁶

One example has to do with the ciliated protozoa, *Tetrahymena*. Rows of cilia arrange themselves into corticotypes. The corticotype is independent of the genes in the nuclei of the protozoan cell. Nanney suggests that the pat-

terns may be maintained and transmitted through the ciliate structure itself.

It is refreshing to read the admission that cells are made by pre-existing cells. Not that it is a new doctrine; it is as old as Aristotle; nay, older; it is as old as the "after its kind" in Genesis. Why does some uniformitarian not complete the obvious syllogism:

Processes which do not happen today never happened. (By his own doctrine).

The origin of living cells from dead things does not happen today. (By the above remarks).

Therefore, the origin of living cells from dead things never happened. (Q.E.D.)

Did Atlantic Ocean Close, Re-open?

J. T. Wilson¹⁷ considers the question: "Did the Atlantic close and then re-open?" He proposes evidence, mostly fauna and geological features, to show that it did, in earlier geological times.

Many creationists believe that something of the sort has happened, and is mentioned in Genesis 10:25. But then, the division of the Earth happened, not ages ago, but about one hundred years after the Flood.

Certainly a dividing of the New World from the Old, a while after the Flood, a dividing which left a few of the more adventurous men and animals cut off in the New World, could explain many known facts.

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BOOK REVIEW

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Uniformity and Simplicity, A Symposium on the Principle of the Uniformity of Nature. Claude C. Albritton, Jr., Editor. Boulder, Colorado: The Geological Society of America, Inc., 1967, 99 pp., \$4.50.

Introduction: Uniformity, the Ambiguous Principle by Claude C. Albritton, Jr., Department of Geology and Geophysics, Southern Methodist University

The Principle of the Uniformity of Nature, stated most commonly as "The present is the key to the past," is defined by geologists in two ways: first, that this maxim is a substantive statement about present and past configurations of the Earth (substantive uniformitarianism); and secondly, that it refers only to the logic and method by which geologists attempt to reconstruct the past (methodological uniformitarianism).

Proponents of substantive uniformitarianism are inclined to interpret geologic history in terms

of changes that are more even and cyclic than episodic or variable. Proponents of methodological uniformitarianism seem to view the classic formulation of the uniformity principle, thus: our reconstructions of the past are bound to be determined by whatever we discover to be going on at present.

The four essays in the volume treat uniformity from the viewpoints of a geologist, an historian of science, a paleontologist, and a philosopher of science. The four authors have common points of agreement: (1) in establishing the significance of the principle of uniformity in the growth and development of historical geology, (2) in failing to defend substantive uniformity, and (3) in identifying methodologic uniformity as a geological formulation of the logical principle of simplicity.

First Essay: Critique of the Principle of Uniformity by M. King Hubbert, United States Geological Survey and School of Earth Sciences, Stanford University, Stanford, California.

The two most outstanding scientific develop-

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ments concerning the intellectual outlook of the learned world since the 15th Century are the Copernican-Keplerian-Galileon revolution and the Huttonian-Lyellian-Darwinian revolution.

In the former event, the Ptolemaic geocentric universe was displaced by the heliocentric solar system and the foundations were laid for the appropriate system of mechanics perfected during the succeeding half century by Isaac Newton.

During the latter event, an earth with a presumed Biblical history of only some 6,000 years, whose plant and animal inhabitants were inhabited by Divine Creation, was supplanted by an earth with an estimated age and history of at least hundreds of millions of years, and whose plant and animal inhabitants had "evolved" during those years from ever more primitive ancestral forms. Also Man, instead of being God's highest and most favored creation, was reduced to being a direct biological descendant of the long animal evolutionary chain.

Hubbert's inquiry is directed toward re-examining the principle of uniformity in the light of present scientific knowledge, with the view of determining the extent of its validity. The author very thoroughly describes the interesting history of conflicting schools of thought concerning uniformitarianism, utilizing excerpts from the writings of great men of science such as Lord Kelvin and the early American geologist, T. C. Chamberlain.

Where Kelvin stressed the miracle of the creation of living creatures and the failure of mathematics and dynamics in contemplation of the miracle, Chamberlain pointed out the fascinating impressiveness of rigorous mathematical analysis and subsequent conclusions which lead to dangerous beguilement.

Hubbert presents an excellent review of energy, thermodynamics, and "backward extrapolation" for rock unit age determinations, concluding that "the earth originated in an as yet indefinite manner from some cosmic event which occurred about 4.5×10^9 years ago." Hubbert further stresses that when the paleontological evidences of life on earth are traced back, we observe the effects of Darwinian evolution in reverse.

Scientists must always be mindful of the fact that deficiencies in present knowledge will be reflected in our interpretations of past events. Prior to the 1940s, any evidence of abundant accumulation of rich uranium material in a small space on the New Mexico desert would have been interpreted as being the result of volcanic explosions, meteoritic impacts, etc.—instead of the possibility of spontaneous fissioning and a nuclear explosion.

Even while stressing the insecure grounds of the principle of uniformity as a result of ignorance of later-developed laws of thermodynamics, Hubbert still feels that the principle helped to emancipate the geological sciences from the "constraints and impediments imposed by assumptions of special creations and interferences by Divine Providence in geological (and human) affairs."

This excellent historical analysis of the principle of uniformity is clouded only by the prejudicial conclusions concerning the interference of Divine Providence, while accepting many assumptions and ambiguities in the application of the principle of uniformity.

Second Essay: The Origins of Charles Lyell's Uniformitarianism by Leonard G. Wilson, Division of the History of Medicine, University of Minnesota, Minneapolis, Minnesota.

Publication of Charles Lyell's *Principles of Geology* in 1830 marked the beginning of geology as a science in that an attempt to interpret the history of the earth was started, using information afforded in superposition of strata and fossil content. Many scientists were influenced by this work, including an immediate and complete "convert" named Charles Darwin.

Lyell saw fundamentally important consequences which followed from his assertion of the uniformity of causes between past and present. One was that, if the geologic past were to be explained by existing causes, then it was essential that geologists study, in detail, the present course of geologic changes over the whole surface of the earth. The action of rivers, waves, and ocean currents; the transport of silt and the deposition of sediments; the activities of volcanoes; the vagaries of icebergs—all these, and many more, concepts would be significant for ascertaining the geologic past.

Wilson produces an interesting history of the controversy that raged in Britain and over the continent concerning Lyell's concepts, revealing the general division of the participants into followers of "uniformitarianism doctrine" and those of the "catastrophism" school. The Frenchman Cuvier produced facts which he used to postulate successive catastrophic inundations of the sea upon land, but Lyell countered with evidence gathered in England of lengthened time span for the earth's history and creating the time necessary for the action of gradual causes.

Wilson records the eventful travels of Lyell and his contact with other prominent geologists wherein critical examination of geological data in the field allowed evaluation of then-current concepts by objective researchers.

*Third Essay: **Revolutions in the History of Life*** by Norman D. Newell, American Museum of Natural History, New York, New York.

The purpose of this essay is to demonstrate that the history of life, on which our geologic time scale is based, has been episodic rather than uniform, and to show that modern paleontology must incorporate certain aspects of both catastrophism and uniformitarianism while rejecting others.

Newell emphasizes the point that the stratigraphic record supplies abundant evidence that physical and biological processes have fluctuated greatly in extent and rate in the past, at times certainly exceeding limits observed during the course of human history. On the other hand, the intuitive conclusion that many of the basic principles of biology, physics, and chemistry are unaffected by the passage of time gains some support from repeated direct observations and from experimentation.

In the development of geology, the concepts of catastrophe and uniformity have both been useful. Formerly regarded as diametrically opposed, many present-day geologists have worked to modify and blend the two concepts so that there is no clearly defined distinction between them. Catastrophism emphasizes the episodic character of geologic history, the rapidity of some changes, and the difficulty of drawing exact analogies between past and present. Aside from the objectionable implications of constancy of rate, uniformitarianism stresses the application of scientific principles to geologic history.

Uniformitarianism and catastrophism no longer are stressed as separate doctrines; rather, they are replaced by the concept of an "evolving" universe (progressive and regressive) in which erratic changes, conditioned by pre-existing states, take place at greatly fluctuating rates. The author believes that the evidence requires the conclusion that many significant episodes in geologic history took place during comparatively brief intervals of time, and that some of these probably involved unusual conditions for which there are no modern close parallels.

On a local or even regional scale, many sedimentary processes operate intermittently and at high rates, as exemplified in the emplacement of deposits of turbidity currents, landslides, and stream floods. Estimates of the average rates of accumulation of any sequence of sediments undoubtedly fall far short of maximum rates. It is salutary to keep in mind the fact that many geologic processes today are highly uneven in their operation; there is no "a priori" reason to think that rates known today are representative for all geologic history.

Newell's analysis of the biostratigraphic system, mass extinctions, the fossil record of animal revolutions, and the causes of animal revolutions (migrations, climate, paleogeographic changes) is concise and objective, leading to the conclusion that the fossil record shows that animal history has been marked by brief episodes of exceptionally high rates of extinction commonly accompanied and followed by somewhat more gradual "evolutionary" recovery.

Newell further concludes that all evidence indicates that episodes of mass extinction may occur within a few hundreds or thousands of years, while the development of a new replacing fauna probably requires hundreds of thousands or millions of years. The geologic record fails to support either the pure catastrophism of Cuvier or the literal uniformity of Lyell.

*Fourth Essay: **Uniformity and Simplicity*** by Nelson Goodman, College of Graduate Education, Harvard University, Cambridge, Massachusetts.

Goodman expresses concern neither with the history of a controversy nor with its effect upon the development of geology, but with what meaning, if any, the principle of uniformity and the issue over uniformitarianism have for the geologist today. If Hutton and Lyell put scientific geology on its feet by advocating the principle of uniformity, that of itself does not guarantee that the principle has any validity or significance today.

If the principle of uniformity is taken as denying any sudden or drastic change, then the principle is plainly false. Volcanic eruptions, earthquakes, collisions in space, and atomic explosions have occurred and do still occur. The state of earth in climate, ocean coverage, and countless other features varies widely from time to time.

Sometimes we are told that the principle affirms the concept of periodic violent and sweeping changes occurring as the result of underlying continuous and gradual processes. Physics discredits this concept, in that a picture is given of the universe of relative macrocosmic stability overlying violent and discontinuous microcosmic activity.

The principle of uniformity is sometimes construed not as denying either the most radical changes or the most turbulent elementary processes, but rather as affirming constancy of laws. The danger here lies in a fanciful notion of the natural laws in force today as potent agencies exerting actual control over the course of events. The real question is which among the laws holding for the present hold also for the past and future. Therefore, the principle of uni-

formity, construed as denying change or abrupt change in the course of the laws of nature, can be rejected as false or futile.

Goodman believes that the residual issue between uniformitarianism and catastrophism comes down to the issue between naturalism and supernaturalism. He suggests that the first step toward clarifying the principle of uniformity of

nature is to transform it into a principle of the simplicity of theory, concluding that the principle then dissolves into a principle of simplicity that is not peculiar to geology but pervades all science and even daily life. And the geologist works under no uncommon handicaps and enjoys no special privileges merely because his work may be historical or descriptive.

BOOK REVIEW

HAROLD ARMSTRONG*

Bombarded Earth, by Rene Gallant. London: John Baker Publishers Ltd., 1964, 256 pp., probably about \$5.00.

While a catastrophist need not, perhaps, be a creationist, a creationist almost must be a catastrophist. For the details of creation cannot be deduced afterwards by examining the creature; it is necessary to depend on records to a considerable extent; and the only existing record which we could even consider believing is that given in the Scriptures. On the other hand, the Scriptural account tells of one catastrophe: the flood; and it would be scarcely consistent to believe the story of creation and not that of the flood.

Catastrophism, Uniformitarianism Contrasted

In contrasting catastrophism, or creationism, with uniformitarianism, an important point must be noticed. The uniformitarian is committed to a universal proposition: that the present state of affairs has come about entirely through slow uniform change.

The catastrophist and creationist, on the other hand, is committed only to particular propositions that: (a) some things in the present state of affairs have come about catastrophically, and (b) some of the kinds of creatures have been created directly. As Aristotle pointed out long ago, a particular proposition can be overthrown by an opposing universal proposition; but one counter-example is enough to demolish a universal proposition.

So if, by appealing to one example of a catastrophe, we can demolish the proposition that all change has been uniform and slow, we shall have brought the discussion down to the investigation of particular cases. And particulars can be known only by experience, either our own or other people's recorded experience; and when it comes to records it is hard to see how any fair judge could deny that the ones which we are using seem to be the most reliable.

For these reasons, then, we creationists are necessarily interested in catastrophism, even if it is not stated as we would state it. And that is the way with this book; the author does not discuss creation very much, and seems to favour a theory of "... evolution ... periodically interrupted by global catastrophic events." (p. 225) Of various possible kinds of catastrophe, moreover, only one is considered: the effect of huge meteorites striking the Earth.

Difficulties of Uniformitarianism

After stating the problem, the author points out some of the difficulties of strict uniformitarianism. The simultaneous death of thousands of animals, as is witnessed by fossil beds; the sudden extinction of whole kinds, such as the dinosaurs; and the sudden burial which must have happened to preserve the fossils, are all such difficulties. But a catastrophe could cause such things.

The fall of a large meteorite would certainly be such a catastrophe, and meteorites have fallen in the past; one at least—the one which fell in Siberia in 1908—having been almost catastrophic. There seem to be no unambiguous written records of other falls, but a record may remain in the Earth, in the form of a crater. Examples of these, which are now generally ascribed to meteorites are the one in Arizona, examined by Barringer; the Henbury Craters in Australia; and the Chubb Crater in Labrador, Canada.

As well as destruction right where it hit, a very large meteorite might cause other effects. It might shift the Earth's axis of rotation, which in turn would affect the climate and possibly the Earth's Magnetism. It might, by changing the Earth's speed of rotation, change the number of days in the year. It might set part of the Earth's crust sliding over the underlying layers, as is envisioned in the theory of continental drift. Besides this, huge tidal waves would likely occur.

It is suggested also that the meteorite might have brought some radioactivity to the Earth,

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or have generated it here. The impact might have caused temperatures high enough to start a thermo-nuclear reaction. Any such happening, of course, could have a great effect on the present state of radioactivity; in particular, it might completely upset the attempts at dating by radioactive carbon.

Physics of Theory Developed

As compared with Velikovsky (who may be taken as a well known catastrophism author), Gallant depends less on ancient literature, but works out the physics of his theories more fully. Several appendices are devoted to the mechanics of collisions, and similar matters.

Meteorites envisioned seem to be all of stone or of metal. In view of recent suggestions, by Patten and others, that ice falling to the Earth may have caused the glaciers and had to do with the flood, it would have been interesting to have

considered the possibility of meteorites of ice. Presumably they would have behaved somewhat similarly to the others, but would have left fewer traces.

Gallant follows the uniformitarian doctrine to the extent of being ready to allow many millions of years to the Earth. Consequently, he can suppose that many large meteorites have fallen. A creationist, on the other hand, who holds at all closely to the Biblical chronology, can hardly believe that many great meteorites have fallen throughout the Earth's whole existence. For this reason, the main thesis of this book may not be of much help to us.

But, as has been already mentioned, it does provide some useful ammunition against the extreme uniformitarian position. Also, some of the discussions, such as the one on radioactive carbon, are useful and interesting for their own sake.

BOOK REVIEW

EMMETT L. WILLIAMS*

Mathematical Challenges to the Neo-Darwinian Interpretation of Evolution (A Symposium held at The Wistar Institute of Anatomy and Biology, April 25 and 26, 1966. The Wistar Institute Symposium Number 5.) Edited by Paul S. Moorehead and Martin M. Kaplan. Philadelphia: The Wistar Institute Press, 1967, \$5.00

On April 25-26, 1966, a group of evolutionary scientists gathered in Philadelphia to attack and to defend neo-Darwinism. The defenders were mainly evolutionary biologists, while the most aggressive attackers were an engineer and a mathematician. Many times during the heated debate defenders revealed the weakness of their own position.

These learned gentlemen did not gather to determine if the evolutionary hypothesis should or could be replaced by a theistic event such as creation. They came and left, as far as the recorded proceedings are concerned, their minds closed to any suggestions of direct creation and world-wide catastrophes.

Several times speakers stated that they wanted to avoid theological entanglements and metaphysics (pp. 3, 4, 27). It was assumed that creationism had been defeated in the nineteenth century (p. 4). Their hostile attitude toward God and creation was shown in one interesting exchange between the British geneticist C. H. Waddington and the French mathematician Dr. M. Schutzenberger (p. 80).

Dr. Schutzenberger had been explaining effectively that random processes could not be used to explain evolutionary development. Frankly, he was presenting a good case for the impossibility of evolution from disorder to order.

Dr. Waddington: Your argument is simply that life must have come about by special creation.

Dr. Schutzenberger: No!

Voices: No!

The general attitude of the attendants of the Symposium is exposed in such an outburst as this. The "open-mindedness" of modern evolutionary scientists is overwhelming.

Catastrophism was dismissed quickly (p. 2).

Not only was evolution assumed to be true (pp. 15, 28, 45, 52, 58, 100, 105), but personality was ascribed to the evolutionary process or to nature in general (pp. 15, 27, 42, 63). Giving such a materialistic process as evolution a personality and asserting that "nature does this" and "nature does that" is nothing but idolatry. Thus evolution becomes a religion.

That is why men defend evolution with such passion, and why they are blinded to creation. Such men often accuse Christians of having blind faith, but they are guilty of the very thing they supposedly despise. It will be shown later in this review that, in fact, the evolutionist is forced to exercise blind faith in his materialistic process, as was revealed in this Symposium.

Major Anti-Evolutionary Thrusts

Attack against neo-Darwinian concepts came primarily from Dr. M. Eden, professor of elec-

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trical engineering at M. I. T., and Dr. Schutzenberger. Occasional milder darts were thrown by other participants. The major anti-evolutionary thrusts will be discussed below.

Eden, assuming the correctness of evolution, pointed out that "the continuity of evolution does not demonstrate that natural laws are operative for the laws are not known (p. 5)." As a matter of fact, the second law of thermodynamics is directly opposed to evolutionary development. Evolution would have to proceed contrary to scientific law. Eden claims that

concepts such as natural selection by the survival of the fittest are tautologous; that is, they simply restate the fact that only the properties of organisms which survive to produce offspring, or to produce more offspring than their cohorts will appear in succeeding generations (p. 5).

Many statements made to explain evolution are often insufficient to explain actual observations (pp. 6, 7). The evolutionary hypothesis is so vague that it can't be scientifically proved or disproved (p. 13). Again Eden notes that

there are events in life which cause certain organisms to live and certain organisms to die; and which organism dies before it produces offspring is a function of certain parameters of the world in which it lives . . . Beyond that, there is nothing to be said about natural selection. There are no other rules; . . .

There must be some rule of evolutionary behavior that can be tested (pp. 12, 13).

In fact, evolution as a process is so vaguely defined in terms of actual mechanism that a man can explain anything and everything by rearranging the variables to suit himself (pp. 47, 63, 67, 71). This point was very well illustrated by Dr. J. C. Fentress:

I would simply like to give one example which I think illustrates how important it is to ask a precise question. When I was in Cambridge, we were working with two species of British vole. We had a little test in which an object moved overhead; one species would run away and the other species would freeze. Also, one species happened to live in the woods and the other happened to live in the field. This was rather fun, not really being a zoologist, I went up to see some of my zoologist friends and I reversed the data. I asked them, simply, why a species which lived in the field should freeze and why one that lived in the woods should run away (when the converse was the case). I wish I had recorded their explanations, because they were very impressive indeed (p. 71).

This generality is so bad that there are really no scientific principles on which the theory of evolution can rest (pp. 70, 76).

Any honest scientist would begin to realize that a theory with such looseness of thought and lack of continuity of logic has something seriously wrong with it. No other scientific process would be universally accepted with such a lack of verification. Such statements as: "Various organisms try various things; they keep what works and they discard the rest (p. 70) ," are absurd and show a complete faith in natural processes. Can such a statement be scientifically proved or disproved? No, it is not even a scientific statement.

Basic Argument Presented

Marcel P. Schutzenberger presents a very basic argument against not only Neo-Darwinian evolution but any kind of evolution in his paper on "Algorithms and the Neo-Darwinian Theory of Evolution." He sums up the argument as follows on page 74, 75:

I apologize for being so assertive but here is the point where experience with computers (more seriously, of course, a few mathematical results) comes in. According to molecular biology, we have a space of objects (genotypes) endowed with nothing more than typographic topology. [Something like a big book written in an alphabet of 20 odd letters. This is the blueprint of an individual, a genotype—from page 73, last paragraph.] These objects correspond (by individual development) with the members of a second space having another topology (that of concrete physico-chemical systems in the real world). Neo-Darwinism asserts that it is conceivable that without anything further, selection based upon the structure of the second space brings a statistically adapted drift when random changes are performed in the first space in accordance with its own structure.

We believe that it is not conceivable. In fact if we try to simulate such a situation by making changes randomly at the typographic level (by letters or by blocks, the size of the unit does not really matter), on computer programs we find that we have no chance (i.e. less than $1/10^{1000}$) even to see what the modified program would compute: it just jams. We can specify what it would take to have the random modifications introduced so that a sizable fraction of all programs start working: It is a self-correcting mechanism which must incorporate something like a symbolic formulation of what "computing" means. Thus no selection effected on the final output (if any!) would induce a drift, however slow, of the system toward the production of this mechanism if it were not already present in some form. Further there is no chance (10^{-1000}) to see this mechanism appear spon-

taneously and, if it did, even less for it to remain. Finally, we can predict what would happen if such a mechanism had been installed: for almost all the mutations the computation performed would have no relationship to the ones executed before; hence no relationship to selective pressure exercised on the output. All this, I repeat, is a simple consequence of the lack of matching between the space of the outputs and the space of the programs. . . . We do not know any general principle which would explain how to match blueprints viewed as typographic objects and the things they are supposed to control. . . .

Thus to conclude, we believe that there is a considerable gap in the neo-Darwinian theory of evolution, and we believe this gap to be of such nature that it cannot be bridged within the current conception of biology.

He again emphasizes this gap on page 121:

In other words, I believe that an entirely new set of rules is needed to obtain that sort of correspondence which is assumed to hold (one way—Darwin, or the other—Lamarck) between neighboring phenotypes and which is needed in similar theories of evolutions. If these new principles, or deductions from old ones, were to be postulated, it would seem then a subsidiary point to discuss how much of random mutations and selections are at work in conjunction with them.

Model or Mechanism Needed

Many times in the Symposium it was suggested that someone ought to develop a model or mechanism that would apply for evolution (pp. 33, 52, 53, 73, 77, 100). However, if there actually existed a reasonable model that could be verified, it would long since have been suggested, since evolution has been subjected to scientific investigation for a hundred years.

Any proposed model or mechanism for evolution from disorder to order has been shown to be incorrect. If evolution is true, as the whole world has been told, why isn't there a satisfactory model or mechanism for this universal process? Simply because there is no process; therefore there can be no all-inclusive model.

Evolutionists have claimed that their process is purely materialistic, depending only on random changes. It was pointed out in this Symposium that such a process as called for by the evolutionists could be set up in a computer program.

However, when the program was run through a computer and a random change introduced, the program was destroyed (pp. 11, 78, 80). The implication is that random changes lead to disorder or chaos rather than to higher levels of

order. Such a conclusion is in accord with the second law of thermodynamics.

Consequently the investigators concluded that evolution could not have operated on a mechanism of random change (pp. 5, 7, 8, 14, 15, 21, 74, 109). Rather than accept the obvious alternative of special creation, these scientists suggested that we look for a new determinate principle in evolution (pp. 9, 11). My suggested determinate principle is: "In the beginning God *created*."

Some Reject Random Change

However, some evolutionists do not want evolution with random change. They seem to prefer a completely materialistic process but not a random one (pp. 30, 99, 117). Possibly they realize random change operates against evolutionary developments.

As alternatives to random changes such suggestions as optimization processes (pp. 35, 45) and fortuitous variation (pp. 2, 4) were offered. Evolution needs fortunate events, not random change to aid its development (pp. 2, 4, 21, 35, 45).

C. H. Waddington suggested that large scale evolution just happened to "luck out" on its upward path by "hitting-the-jackpot" (p. 114). Such unscientific statements are hardly satisfying. Such a process is no longer completely naturalistic. How can brute, unintelligent physical forces consistently select the proper path that leads to higher order? All suggested mechanisms fail.

Realizing that the mechanism for evolution cannot be random change and that any mathematical analysis will reveal this weakness, many of the participants of the Symposium suggested that mathematicians leave evolution alone (pp. 16, 31, 42, 75, 76, 105)! Or, more politely, they indicated mathematical methods cannot be applied to evolution. Consider the statement of Dr. W. E. Howard:

It appears to me that much of the essential logic of evolutionary theory will be determined in the future from new concepts about the complex biological entities involved and their delineation as entities, not from quantification of biological measurements (p. 105).

One of the weakest points of evolution has been revealed here. General nebulous, unverifiable theories should never reach the respectability of scientific acceptance unless they can be fitted into some kind of a quantized system.

If a phenomenon is observed in nature and is subject to scientific investigation, a scientist, after conducting the proper experiments, should be able to develop a set of generally verifiable principles with which the phenomenon could be explained. The ideal result of any experimentation would be that the experimental data could

be fitted into some form of mathematical equation.

Such an equation could be used to determine the correctness of the theoretical postulations when checked with data collected from natural situations. Possibly evolutionists realize that their "science" is not rigorous enough to stand the onslaught of a mathematical analysis. Any theory devoid of rigid general principles or mathematical rigor is more nonsense than science.

Evolution Requires Faith

Since evolution cannot be scientifically verified, its acceptance requires faith. Many statements made in this Symposium show how little is known about the process of evolution (pp. 4, 6, 16, 22, 27, 30, 31, 49, 54, 58, 70, 73, 77, 103, 125):

I am afraid we will never be able to arrive at a realistic interpretation of evolution (Dr. E. Mayer, p. 54).

My understanding is that the problem involved is how you get from a lower organism to a higher organism; or at a different level, perhaps, what is it about the genetic material which is going to differentiate a horse from a pig; not how one bacterial strain will die due to the deficiency of one enzyme. However, the argument as it is presented, I think, could probably be leveled against all of biology in that, insofar as I know, there is not one mechanism which is completely understood (Dr. E. Shahn, p. 77).

In discussing ecobehavioral problems in evolution, Dr. W. E. Howard states, "Just because there is insufficient biological knowledge at the moment to suitably integrate these many phenomena, however, does not mean that these are inauthentic phenomena (p. 103).

In other words, let's have faith in the evolutionary process! Considering all of these comments which reveal deficiencies in the evolutionary theory, why is evolution taught as fact in many schools? I suggest that no evolutionary process exists.

Small changes Not Evolution

Many times in this Symposium the participants used examples of small changes in different

species as a proof that evolution has occurred. For instance, the changes in size and pigmentation of house sparrows because of a change in environment are cited as proofs of a rapid rate of evolution (pp. 47, 48). This is not evolution at all. The starting species is a sparrow and the final species is a sparrow. The Bible allows for changes after its kind; the changes in the sparrow (*Passer domesticus*) fit into this category.

The resistance of the Madagascar fly to certain insecticides is used as a "proof" for evolution (p. 98). This is shallow reasoning. Could not the flies that survived the insecticide simply have been resistant to it? Again you start with one species and finish with the same species. Where is the evolution? There is none.

One author attempted to deal with thermodynamics of open systems (pp. 125, 128). It seems that evolutionary scientists realize that the second law stands in opposition to any evolutionary development. Many of these men try to avoid this difficulty by assuming that evolution from disorder to order can occur in open systems. No experimental proof exists for this assumption. A quotation from the Symposium report will illustrate this reasoning:

According to this evolution criterion, a part of internal entropy production related to fluxes in the systems cannot but decrease with time as evolution is progressing (p. 125, emphasis added).

This is a clever bit of reasoning. Assume evolution occurs; then show that evolution is possible in spite of the second law of thermodynamics! Evolutionists are adept at circular reasoning. Such reasoning processes prove absolutely nothing.

Frank comments of many of the participants in the Symposium show how weak the case for evolution is. They show also that these scientists are not compelled by experimental evidence or natural observations to accept the theory of evolution. Instead, scientists accept evolution in spite of experimental findings, and against the dictates of scientific law.

Christian men of science should not be ashamed to admit that they exercise faith in believing in creation by direct acts of God. True science is on our side.

ERRATA

The Editors wish to apologize for some misprints of numbers in the article by Prof. Robert Whitelaw in the September, 1968 issue. In Chart 1 on page 79, Prof. Whitelaw intended the period from the Exodus to the Temple to be 580 years, the period from Cyrus' edict to the Cross to be 487 years, and consequently the period from the Flood to the Cross, Era II, would be

exactly 3,000 years.

Also in the September issue, on pages 68, the word "than" should be added at the end of the sixth line of the third paragraph in the right column.

Further, on page 86, each of the symbols of % which appeared in the left column should be substituted by the symbol: o/oo.

Our Society of research scientists representing various fields of successful scientific accomplishment is 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. Beginning in 1964, we are publishing an annual yearbook of articles by various members of the Society and thereafter a quarterly review of scientific literature. Our eventual goal is the realignment of science based on theistic creation concepts and the publication of textbooks for high school and college use.

1. The Bible is the written Word of God, and because it is inspired throughout, all its assertions are historically and scientifically true in all the original autographs. To the student of nature this means that the account of origins in Genesis is a factual presentation of simple historical truths.
2. All basic types of living things, including man, were made by direct creative acts of God during the Creation Week described in Genesis. Whatever biological changes have occurred since Creation Week have accomplished only changes within the original created kinds.
3. The great Flood described in Genesis, commonly referred to as the Noachian Flood, was an historic event worldwide in its extent and effect.
4. We are an organization of Christian men of science who accept Jesus Christ as our Lord and Saviour. The account of the special creation of Adam and Eve as one man and woman and their subsequent fall into sin is the basis for our belief in the necessity of a Saviour for all mankind. Therefore, salvation can come only through accepting Jesus Christ as our Saviour.

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