# A DECADE OF CREATIONIST RESEARCH

DUANE T. GISH*

*The primary purpose of the Creation Research Society is to carry out, or to encourage, Creationist research in the natural sciences, and to publish the results of such research. By Creationist research is meant research which proceeds from a belief in, and attempts to correlate with, special Creation.*

*It is shown that, in about the last ten years, a significant amount of research has been accomplished. It has been done, moreover, at very little expense, and, as far as is known, with no expenditure whatever of public money.*

*While reference is made especially to the Creation Research Society, it is known that good work has been done outside the Society. No claim is made that this list of research is complete. It is probably impossible to list everything which has been done; and some work is not included mainly because it was difficult to fit it under any particular heading.*

*It is clear, from what is reported here, that Creationist research is a worthwhile activity. There is, of course, much more to be done; and it is hoped that many more people who are able to do research will come forward.*

## Introduction

Evolution is the dogma of the scientific and educational establishments. Many millions of dollars from government sources are spent each year on research that is oriented and correlated within the framework of evolution theory. On the other hand, as far as I know, not a single tax dollar has been available, or is available, for research by scientists who openly attempt to correlate their results within the concept of special creation. Perhaps this virtual "shut-out" is due in part to lack of ingenuity and aggressiveness on the part of creationists, but there is little doubt that the most ingenious and sustained action of creationists would do little to weaken the stranglehold evolutionists have on public funds.

In spite of this fact, a significant and growing research effort by creationists has been sustained during the past decade. Although a limited amount of research had been conducted prior to, and since its founding, independently of, the Creation Research Society, the establishment in 1963 of this creationist organization of Christian men and women of science, has provided the inspiration for, and, to a considerable degree, the funds necessary for this research.

This Society was established primarily for research in all fields of science designed to demonstrate that the scientific evidence related to origins can be correlated and explained much more satisfactorily by the concepts of special creation and a universal catastrophic flood than the concepts of evolution and uniformitarian geology. Beginning in the Fall of 1964, the results of this research have been published in the *Creation Research Society Quarterly.*[1] This paper is a review of the articles published in the *Quarterly* during the first decade of publication, which constitute the results of original research.

These papers can be arranged in approximately six scientific categories: geology, genetics, natural selection, taxonomy, general biology (genetics, natural selection and taxonomy are specializations within biology, of course), and thermodynamics.

*Duane T. Gish, Ph.D., is Associate Director of the Institute for Creation Research and Professor of Natural Science, Christian Heritage College, San Diego, California 92116. He has degrees in chemistry and in biochemistry, has spent 18 years in biochemical research, and has published many papers and books on science and on Creation.

## GEOLOGY

Geological papers constitute the largest category of papers published in the *Quarterly.* This is not surprising. The research needed to demonstrate the fact that evolution could not occur and, in fact, has not occurred, has already been performed. These research results provide strong support, on the other hand, for a special, supernatural, direct creation.

Yet, considerable research needs to be done to support the *specific Biblical creation model* and to re-establish Flood geology as an alternative to evolutionary geology. Thus, most of the research performed by creationist geologists has been directed at the goal of interpretation of geological data within the concept of catastrophism in contrast to the actualism of evolutionary geologists.

**Overthrust.** Evolutionary geologists assume that sedimentary strata have been laid down over vast stretches of time, and have arranged these strata in a supposed time-sequence, particularly the fossil-bearing strata, based on assumed evolutionary transformations. The strata are identified by fossils that are characteristic of each strata, usually marine invertebrates.

It is believed, for example, that the Cambrian strata, identified by the particular types of trilobites found within them, were laid down over a period of about 80 million years beginning approximately 600 million years ago. Evolutionary geologists thus believe that these sedimentary deposits were laid down during what is called the Cambrian Period.

In addition to trilobites, these rocks contain fossils of every one of the major invertebrate types, including jellyfish, sponges, brachiopods, worms, crustaceans, and corals (evolutionary ancestors for which have never been found, the so-called Precambrian rocks being devoid of multicellular fossils).

The Cambrian Period was supposedly followed by geological periods of successively younger age, such as the Ordovician, Silurian, Devonian, Mississippian, Pennsylvanian, etc. Fishes are not found in Cambrian rocks, but appear in the Ordovician. Amphibians are not found in Cambrian, Ordovician or Silurian rocks, but are found in Devonian and "younger" strata. Reptiles appear in yet "later" strata, then birds, mammals, etc.

The various strata have thus been arranged in an assumed time-sequence according to a supposed evo-

lutionary development of invertebrate to fish to amphibia to reptiles to mammals to primates to man. The arrangement of the various strata in this assumed time-sequence is known as the geological column.

If this assumed time-sequence is correct, and was actually created by the slow deposition of one set of strata on top of another through vast stretches of time, then "younger" strata should always rest on top of "older" strata. On the other hand, if, as Flood geologists maintain, most of these sedimentary deposits were laid down at the time of the Flood, and the particular sequence usually observed was determined by a combination of factors, including ecological zones, hydrodynamic sorting, attempts to reach safety at higher altitudes, etc., then breaks in the sequence and even occasional revearsals of the usual sequence of fossils would be expected under the catastrophic conditions of the Flood.

Many inversions of the strata scattered throughout the world actually exist, "older" strata lying on top of "younger." In places this upside-down arrangement of the strata is hundreds and even thousands of square miles in extent. To explain the manner in which older strata became superinmposed upon younger strata, evolutionary geologists are forced to postulate vast "thrust-faults."

Supposedly huge blocks of the crust were uplifted and then somehow thrust over the adjoining area. The upper layers of the "thrust block" were then eroded away, leaving the lower, or older, strata of the thrust block lying on the younger strata underneath. This sequence of events thus supposedly accounts for the many cases where the older fossils of more "primitive" creatures lie on top of younger fossils of more "advanced" evolutionary development.

Creationist geologists have attacked this postulate on the basis of both the physics involved and the lack of field evidence required to substantiate these supposed overthrusts. While pointing out that there is evidence of local folding and overthrusting on a small scale, creationists maintain that physical evidence along the contact line, such as brecciation, gouge, and slickensides, does not exist for the supposed large thrust-faults. A number of field expeditions have been undertaken to search for evidence, or lack of it, for overthrusting.

Harold Slusher, then assistant professor of physics at the University of Texas, El Paso, (now Research Associate at the Institute for Creation Research and Professor of Physics, Christian Heritage College, San Diego) examined a supposed overthrust in the Franklin Mountains near El Paso.[2] In that area a massive structure of Upper Ordovician limestone (supposedly about 450 million years old) lies on top of strata identified as Lower Cretaceous (supposedly about 130 million years old). Neither Professor Slusher nor the geologist accompanying him could find any physical evidence of overthrusting.

In 1956 and 1957, Walter Lammerts visited the site of the so-called Lewis "overthrust" in Glacier National Park. Dr. Lammerts' doctorate is in genetics, but he has had university courses in geology and has maintained a keen interest in this field. The Lewis "overthrust" extends laterally from 15-30 miles. It is postulated that a huge block of Precambrian limestone, thousands of feet thick and almost 10,000 square miles in area, was thrust eastward over soft Cretaceous shale, resulting in a formation supposedly older than 600 million years resting on top of a formation about 100 million years old.

Dr. Lammerts studied the contact line exposed at Chief Mountain, one of the most imposing sights in the Park. He reported that all the evidence he could discover indicated that the contact was sedimentary rather than a thrust-fault.[3]

Clifford L. Burdick, a professional geologist, carried out an extensive survey of the contact line of the Lewis "overthrust" at several places in the U.S. and Canada. The report of this research[4] includes an excellent review of the overthrust concept and of the standard interpretation of the so-called Lewis overthrust.

The contact line at Wynn Mountain, Chief Mountain, and Roes Creek in the U.S., and at Crowsnest Pass, and near Mt. Eisenhower in Canada was studied. Evidence for thrust-faulting along the contact line, Burdick reported, such as gouge (rock powder), mylonite (coarsely ground rock), tectonic breccia (conglomerate including rock fragments set in a matrix), and slickensides (striations on rock surfaces) was absent.

At Mt. Ishbel, near Mt. Eisenhower, Burdick reported that the strata were sharply upturned, and he found great piles of rock rubble along the pass between the two mountains. He concluded that if there had been local lateral pressure in the area, the rock was so incompetent it would have broken up rather than moving laterally, and that the upturned strata of Mt. Ishbel had been caused by a granitoid intrusion from underneath.

If, as Burdick and Lammerts have concluded, the Lewis contact line is sedimentary and not a thrust-fault contact line, then the entire concept of the geological column as an evolutionary succession of geological ages is highly questionable, to say the least.

Burdick and Slusher studied an alleged overthrust in the Empire Mountains in Pine County, Arizona.[5] They first examined known thrust-faults in other areas to confirm the type of evidence to be found where actual thrust-faulting has occurred. In one case, for example, a block of limestone about one-half mile long had been thrust about one-half mile. A gouge layer about three feet thick composed of ground-up rock powder gave evidence that thrust-faulting had occurred. At another site of a small thrust-fault, a 15-20 foot thick layer of tectonic breccia (crushed and ground pieces of rock fragments) and slickensides gave evidence that overthrusting had occurred.

Examination of the alleged contact line of the Empire Mountain "overthrust" gave no such evidence. The overlying Permian rock (greater than 200 million years in age, allegedly) fit into deep grooves eroded in the underlying Cretaceous (about 100 million years old, supposedly) like a glove on a hand, or like material poured into a mold. If the Permian cap rock had been thrust over the Cretaceous (as evolutionary geologists contend), why, Burdick and Slusher ask, were not all of these sharp projections planed off? Why is there no evidence, such as brecciation, gouge,

and slickensides, for thrust-faulting? They concluded that the evidence indicates that the contact is depositional and not a thrust-fault contact.

Lammerts studied the classical Lochseite of the Glarus "overthrust" near Schwanden, Switzerland.[6] Here a huge block of Jurassic limestone (about 180 million years) rests on top of a Eocene formation (about 60 million years). The overlying rock of over a mile in thickness supposedly was thrust almost 21 miles over the underlying Eocene. Lammerts' analysis of the evidence failed to support the latest evolutionary uniformitarian concepts on the Glarus overthrust (reviewed in his paper). Lammerts presented an alternative proposal, based on Flood geology, which explained how these deposits may have been laid down in the present order.

**Fossil Anomalies.** When fossils are found in strata which would be impossible according to standard evolutionary interpretations, these are labeled fossil anomalies. Usually such reports are ignored by evolutionary geologists, since they assume that an error has been made or an obvious explanation must exist. Several such fossil anomalies have been reported in the *CRS Quarterly.*

Professor Wilbert Rusch has studied the subject of fossil human footprints, personally examining some found in Kentucky.[7] This study has become even more interesting in the light of the reported finds of human footprints along with dinosaur footprints in Cretaceous limestone of the Paluxy River area near Glen Rose, Texas. This latter report has been extensively documented by Stanley Taylor in the film, "Footprints in Stone."[8] Rusch indicates that some of the footprints he researched (not in the Glen Rose area) were carvings, but others appeared to be genuine. He also recounted the report of an iron pot found in coal.

William Meister, while searching in the trilobite beds of Antelope Springs near Delta, Utah, split open a slab of rock to expose what appeared to be a human sandal print in which was imbedded three fossil trilobites.[9] If true, this means that this footprint was made when trilobites were still in existence, but trilobites supposedly became extinct many scores of millions of years before man had evolved! Evolutionary paleontologists and anthropologists merely shrugged off this find as not genuine, but an anomaly due to some natural cause.

Clifford Burdick has reported on his investigation of the find of two modern human skeletons in the Dakota Formation of the Cretaceous (supposedly about 100 million years old) near Moab, Utah.[10] During a mining operation for hydrothermally deposited copper, a hillside had been bulldozed away. The hill was composed of Dakota sandstone. On the floor of the excavated site, Lin Ottinger, a rockshop owner and guide of Moab, discovered two human skeletons. The blade of the bulldozer had sliced through the skeletons, leaving most of the remains exposed at the surface.

Burdick concluded that the bones were definitely in place, with no evidence that the surrounding rock had been disturbed. He believes that the location of the find deep within the hillside indicates that these individuals were buried at the time the Dakota sandstone was deposited.

Prof. Wilbert Rusch and I carried out an investigation of this find shortly after Burdick's visit. We also visited the University of Utah to examine the bones, which were in custody of the Anthropology Department. There was no doubt that these skeletons were buried deep within the hillside, and as Burdick reported, there was no evidence the surrounding rock was disturbed.

We felt, however, that since all of the overlying material had been removed, the evidence required to positively eliminate the possibility that these individuals had reached the site via a fissure or cave was not available. Thus, while all the evidence that did exist indicated that these individuals were part of the original deposit, the possibility that they had entered the site at a later date could not be excluded with all certainty. Other reports of the finds of modern human remains in sediments supposedly many millions of years old have been summarized by Cousins.[11]

**Palynology.** Palynology is the study of fossil pollen and spores. Burdick has reported on his palynological studies of formations in the Grand Canyon.[12, 13] The striking fact about his results was the presence of fossil pollen grains of plants in sedimentary deposits that were allegedly laid down several hundred million years before the plants are believed to have evolved. He reported, for example, the discovery of fossil pollen of gymnosperms, many of them conifers (pine trees), and of angiosperms (flowering plants) in Cambrian and Precambrian formations.

The gymnosperms, or seed-bearing plants, supposedly did not evolve until long after the Cambrian rocks had been laid down, and the angiosperms are supposed to have evolved even later. The Cambrian Period is believed by evolutionists to be a time when no land plants or animals were in existence, in fact, a time when only marine and fresh water invertebrates existed.

A report by Rusch in the *Quarterly*[14] related the fact that there have been numerous reports in recent years of the finds of fossil pollen of woody plants, including conifers, in Cambrian rocks by evolutionary geologists. Even fragments of woody plants have been found in Cambrian rocks.

These finds decisively contradict the supposed time and order of so-called plant evolution given in almost all books on geology, paleobotany, and evolution. These facts are not even known to the vast majority of geologists and biologists. For example, when I brought these facts to the attention of the audience during a debate with the world-famous botanist and evolutionist, Dr. G. Ledyard Stebbins, he was astounded, and demanded documentation. His astonishment was compounded when the documentation I readily provided included a report by one of his colleagues at the University of California at Davis and a close friend, geologist Dr. Daniel Axelrod!

## GENERAL GEOLOGICAL REPORTS

**Geology of Mount Ararat.** Burdick has reported on the expedition that visited Mount Ararat in 1966. Mount Ararat lies in the northeast corner of Turkey

near the Russian and Iranian borders. It is believed to be the Biblical Ararat where the Ark came to rest. The expedition, one of several in recent years, including the 1972 Institute for Creation Research expedition led by John Morris, was undertaken primarily to search for the remains of the Ark. Numerous alleged sightings of the Ark have been reported in ancient times and in relatively recent times.

While in the Ararat area, Burdick undertook a study of the geology of this area.[15] He postulated that the Paleozoic and Mesozoic limestone that covers eastern Turkey was laid down at the time of the Flood. During the Flood, Burdick reports, basaltic and andesitic lava burst up through the limestone beds to form a peak nearly 20,000 feet high. Much of the basalt and andesite composing upper Ararat is often found in rounded blocks called pillow lava, which is the hard, micro-crystalline form taken by lava when it is extruded under water. Erosion has reduced the mountain to its present 17,000-foot height.

**Research on the Joggins Petrified Trees.** Harold Coffin has re-investigated the Carboniferous section of Joggins, Nova Scotia[16] (the Carboniferous includes the Mississippian and Pennsylvanian Periods, which are believed by evolutionists to have been laid down over a period of about 50 million years beginning about 300 million years ago). The prevailing idea of evolutionary geologists is that the petrified trees and numerous coal seams in the Joggins area are *in situ,* that is, in their original position of growth. It is postulated that there were numerous long periods of growth of bogs which slowly formed coal at lower depths. Repeated transgressions of the sea, it is believed, buried these coal seams and engulfed the trees.

Dr. Coffin's study did not support this concept. His research, on the other hand, produced numerous lines of evidence that the trees, along with masses of plant material, had been transported by water to the site where they are now found, and were then buried under conditions of rapid sedimentation. Petrification and carbonization followed. The evidence for this hypothesis included absence of soil zones, unusual plant fossils within hollow stumps, remarkable preservation of delicate fossils, diagonal trees, abundant presence of the marine tubeworm *Spirobis* (the attachment of this marine, or salt water, organism, to vegetal matter in the coal contradicts the bog environment hypothesis), and polystrate trees (trees extending through two or more strata, each of which, according to evolutionary interpretations, was deposited slowly over a long period of time).

The evidence developed by Coffin supports the hypothesis that the coal was formed by the tremendous quantities of trees and vegetal matter that was uprooted, transported and buried by alternating tidal waves and other catastrophic effects of the Flood. I have briefly reviewed laboratory experiments that produced petroleum in 20 minutes and coal in a few hours from cellulosic material (garbage and manure, for example, demonstrating that the formation of coal and oil would not require vast stretches of time).[17]

Coffin has recently given an excellent report of his studies of the petrified forests in the Yellowstone Park area.[18] These studies have led him to believe that these trees also had been transported and buried at their present site by water action.

**The Sisquoc Diatomite Fossil Beds.** Bernard Northrop researched the diatomaceous earth beds near Lompoc in Santa Barbara County, California.[19] Evolutionary geologists have maintained that these beds formed gradually over vast periods of time, but Northrup's studies provided striking evidence of the rapid and catastrophic deposition of these beds.

In the Sicquoc area, countless billions of the delicately sculptured siliceous cell walls of diatoms (microscopic organisms) have been deposited in such a way that fish were entombed with bones and even body organs intact. Some fossil fish were trapped so that they lie parallel to the bedding plane of the diatom matrix, but many other fish fossils extend across the bedding plane. The latter fossils (standing partly on end) must have been buried quickly, or else the part not buried at first would have been devoured by scavengers, or would have decayed long before it could have been buried by a diatom "rain." Fossils of various fish, sea birds, and whales also indicate that the diatom material was deposited rapidly and catastrophically rather than by gradual and uniform activity.

Northrup postulated that the original diatom supply was first formed in cool waters after the Flood and was redeposited at the Lompoc site during a post-Flood catastrophe.

**Cyclical Black Shales of West Central Illinois.** Walter Peters has applied photomicroradiographic techniques to the study of black shales of the Pennsylvania system of west central Illinois.[20] The evolutionary uniformitarian interpretation of a slow, undisturbed sedimentation and mineralization of these shales over vast periods of time could not be true, according to Peters.

Study methods included gross and macrophotography, microscopic examination of thin shale chips, and photomicrographic inspection of X-rays of shale samples. Cyclical deposition was indicated by the structural details of the shale as well as by the virtually mutually exclusive occurrence of foraminifera and conodonts in successively alternating bedding planes and black shale matrix. Rapid transport and burial was implied from several observations including Orbiculoidea shells packed into lenses up to one inch thick; microlaminations apparently interrupted by small coal balls; and the distorted bedding, both at the bottom and the top of the shale member.

Peters concluded that all of his observations can be used to support strongly the Biblical tidal interpretation of fossil deposition and burial.

**The Capitan Fossil "Reef."** The occurrence of alleged fossil "reefs" in various portions of the geologic column has been recognized by many observers to be a very difficult problem to reconcile with Biblical chronology. If accumulated at approximately the same rate as modern reefs allegedly form, a single fossil "reef" would take many thousands of years to form, and therefore would jeopardize the implication from Genesis of a young earth and would also question the role of the Flood in earth history.

The famous Capitan Limestone in the Guadalupe Mountains of southeastern New Mexico and western Texas is alleged by many geologists to be a classic example of a fossilized "barrier reef." Stuart Nevins conducted a study of this alleged fossil reef to see if the actual field evidence supports this concept.[21]

Nevins reported that his study cast doubt on the various depositional and ecologic environments alleged to be associated with the "Capitan Reef." The so-called "backreef lagoon" and "forereef talus" deposits were not contemporaneous with "reef" accumulation. In addition, the Capitan lacks large, *in situ,* organically-bound frameworks and deposits of broken debris which can be shown to be derived from an organic framework.

Nevin's research indicated that the Capitan is composed primarily of broken fossil fragments in a fine-grained matrix of lime, silt, and sand which were not wave-resistant when deposited. The fossil flora and fauna of "Capitan Reef," he reported, represent a shallow water assemblage which was not especially adapted to a wave or strong current environment. Reef-forming organisms which could bind sediments and build frameworks are either altogether absent or largely inconspicuous.

Nevins concluded that the available data certainly do not require many thousands of years for the Capitan to have accumulated, and therefore seem to present no problem for Biblical chronology. Instead, the lack of large organically-bound structures, which would have required thousands of years for growth, suggests that deposition was very rapid. Nevins proposed that the Capitan Limestone accumulated rapidly either during the last stages of the Flood or shortly thereafter.

**Geologic Study of the John Day Country.** Recently Nevins reported on his study of the strata of the John Day Country in the Blue Mountain region of northeastern Oregon, which reveals abundant testimony of volcanic catastrophism.[22] The strata, which show a cumulative thickness of over 7,000 feet, consist primarily of numerous terrestrial lava flows, gigantic ash-flow tuff beds (each extruded in a single explosive event as a huge cloud of incandescent ash), boulder breccia layers (presumably deposited from enormous mud flows), tuff-breccia beds (representing very explosive stages in volcanism), and volcanic siltstone and sandstone (deposited as each explosive episode subsided). The area covers about 5,000 square miles and lies southwest of the Columbia Plateau, which consists of a basaltic lava flow covering 100,000 square miles and as much as a mile in thickness.

Nevins pointed out that fossils of large mammals and tropical and subtropical plants occur in particular horizons, which suggests that only on rare occasions of quiescence between volcanic eruptions was life re-established in this region. Nevins maintained that the supposed evolutionary fossil series leading to the modern horse is artificial and thus false. Further, he maintaind that there is little evidence suggesting 60 million years of history for this area as assumed by evolutionary geologists.

Nevins suggested that since good evidences of the Flood are not found in the John Day Country strata he studied, the Flood must have preceded the formation of these strata. He thus concluded that an interval of many hundreds of years intervened between the close of the Flood and initiation of the recent glacial period. The vast volcanism of the John Day Country and the glacial ice sheet which covered the northern areas of North America and Europe are thus attributed to catastrophic events which occurred during the period of readjustment following the stupendous catastrophism of the Flood.

**The Magnetic Moment and Age of the Earth.** Thomas Barnes has carried out a fascinating study of the decay of the earth's magnetic moment and the implication this has regarding the age of the earth. His results are contained in an article in this issue and in a series of papers in the *CRS Quarterly,*[23-25] and in a monograph published by the Institute for Creation Research.[26]

The earth's main magnetic field has been shown to be due to a magnetic dipole, the strength of which is called its magnetic moment. The magnetic field is due to circulating electric currents. These currents probably reside in the core of the earth. The core is believed to consist of hot liquid metal, composed mainly of iron. There is no mechanism to sustain these currents, so these currents and the resultant magnetic field are decreasing in strength, that is, decaying. These currents and the accompanying magnetic field thus have every appearance of having been "wound-up" at some time in the past, with uninterrupted decay to the present.

Measurements of the earth's magnetic moment have been made since 1835. Using these measurements, Dr. Barnes has calculated that the earth's magnetic moment is decaying exponentially with a half-life of 1400 years. The magnetic moment is decreasing because the circulating electric currents which generate the earth's main magnetic field are decreasing in strength. Part of the energy of these currents is continually being lost as heat energy, with resultant decrease in the strength of the currents and the magnetic field they generate.

Extrapolating the strength of the earth's magnetic moment back into the past, based on the exponential decay curve, the value of the magnetic moment at any time in the past can be calculated (the magnetic moment would double for every 1400 years). The heat that would be generated by the current necessary for such a magnetic moment can also be calculated. Beyond about 10,000 years, the magnetic moment would exceed a reasonable estimate for any planet the nature of the earth, and by one million years the current required to generate the magnetic moment predicted on the basis of the decay curve would liberate enough heat to vaporize the earth. Barnes thus maintained that these data, which are especially reliable because they are based on measurements over 130 years, indicate that the earth cannot be much older than 10,000 years.

In an attempt to get around this barrier to a long age for the earth, evolutionists must postulate that some sort of a self-generating dynamo causes the liquid in the core to circulate, generating the magnetic field, rather than an electrical current circulating in a quiet

liquid core as postulated by Barnes. Barnes pointed out that there is no physical evidence for motion within the core, and, in addition, a self-generating dynamo within the core would require motions of an extremely complex and unreasonable nature. He concluded that no acceptable dynamo theory to sustain or oscillate the earth's magnetic field has ever been conceived nor is one very likely. Dr. Barnes strongly affirms that the data on the earth's magnetic field demand a young age for the earth, an age that probably could not have much exceeded 10,000 years.[26]

## GENETICS

**Mutations and Evolution.** In a series of papers in the *Quarterly*,[27-29] Walter Lammerts presented data which are very damaging to the idea that mutations could have supplied the means of change that would have allowed evolution to occur.

Genes are the units of heredity which when replicated by an organism and passed on to offspring during reproduction cause the characteristic traits of a species of organisms to be reproduced. These genes are composed of a type of chemical structure called deoxyribonucleic acid (DNA). Each gene, or DNA unit, is made up of hundreds or thousands of sub-units arranged in sequence in a long chain. The genetic message encoded in each gene is determined by the specific sequence or arrangement of the sub-units in the DNA chain, analogous to the way the message in this sentence was composed by arranging the letters of the alphabet in a unique sequence.

Mutations are random changes in the chemical structure of DNA. That is, mutations cause one sub-unit to be randomly exchanged for another, or sub-units may be randomly excised or inserted. Analogously, letters in this sentence might be blindly removed and replaced with others. Blindly or randomly exchanging letters in the sentences on this page would rapidly generate spelling errors and, very shortly, complete nonsense. Similarly, the effect of mutations in living organisms is harmful and often lethal.

While evolutionists readily admit that the vast majority of mutations are harmful, they are forced to postulate that a small percentage, perhaps one in ten thousand, must be beneficial. In the final analysis, the only source of variability required for evolution must come from mutations of one kind or another, and beneficial changes must occur if evolution theory is true. Thus, evolutionists insist that beneficial mutations do occur.

Creationists maintain that it is extremely doubtful if a truly beneficial mutation ever occurs. A random change in a highly complex and intricately coordinated machine could produce only disorder and loss of function. Even if a beneficial mutation could occur, a mutation could only bring about a change in an existing characteristic and thus could not create any new trait or generate increasing complexity.

Dr. Lammerts studied the effect of neutron radiation of Queen Elizabeth rose buds in producing mutant varieties.[27] He found that such radiation was successful in inducing a wide range of variations in rose plants grown from such buds. His results showed that biologically, all of the mutations were defective variations from the pattern of development characteristic of the variety radiated.

His studies further indicated that mutations can only alter various phases of the basic varietal pattern expression, but the basic pattern itself remains unchanged. He concluded that truly unique and outstanding varieties of roses such as Peace, Charlotte Armstrong or Queen Elizabeth would never result from the accumulation of mutations.

In two excellent articles,[28,29] Lammerts has reviewed the effects of mutations and other chromosomal changes on various organisms, both plants and animals. This review of the data indicates that neither mutations nor chromosomal changes, such as translocations, inversions and polyploidy, provide a mechanism for bringing about the changes demanded by evolution theory. Lammerts concluded that the incredibly complex and amazingly integrated genetic system could only be the product of a remarkably intelligent Creator.

**Effect of Genetic Aberration in a Tomato Plant.** William Tinkle studied the characteristics of a tomato plant which had three cotyledons instead of the normal two.[30] The first lateral structures formed on a seedling plant differ from true leaves and are called cotyledons. Some plants are monocotyledenous while others are dicotyledenous. Occasionally a genetic aberration of some sort will cause a plant to have one or two extra cotyledons. Thus, plants that ordinarly have two cotyledons may produce, on rare occasions, varieties with three or even four cotyledons.

Dr. Tinkle found a tomato plant that had three cotyledons instead of the two that is normal for this plant. He collected seeds from this plant and studied the progeny produced from these seeds. From 100 seeds that he planted, 69 plants developed. Three of the plants had three cotyledons and 66 had normal two cotyledons. Planting seeds from the three tricotyledenous mutants produced seven plants with three cotyledons and 30 with two cotyledons.

Dr. Tinkle studied the normal and mutant varieties with respect to fertility, vigor and resistance to frost. Although one might expect that a plant with an extra cotyledon, because of the extra surface exposed to light, might have an advantage, the plants with the extra cotyledon were found to be inferior to the normal plant in germination, rate of growth, and resistance to frost.

Even some of the plants produced from the seeds of the mutant tricotyledon plant which bore the normal number of cotyledons (two) showed growth abnormalities. The mutant gene for the tricotyledenous condition is apparently recessive. That is, its effect is more weakly expressed than the normal gene for two cotyledons, which is dominant. Though the plants just mentioned were heterozygous, bearing the dominant normal gene as well as the recessive mutant gene and thus having two cotyledons, even the presence of the mutant gene in the heterozygous state weakened the plant.

This example of a mutation which causes the abnormal presence of three cotyledons in a seedling tomato plant rather than the normal two and which results in the production of an inferior plant is addi-

tional evidence that mutations, being random changes in an incredibly complex and intricately coordinated genetic system, are inevitably harmful.

**New Guinea Communities and the Migration-Dispersion Model.** The origin of the peoples of New Guinea is a subject of dispute among anthropologists. Regardless of their origin, New Guineans in the past have tended to isolate themselves in small groups which have become diversified both linguistically and genetically. R. Daniel Shaw compiled data on the ABO, MNS and Rh blood groups for natives of New Guinea in 37 areas spread over the entire island in an attempt to discover any relationships that might aid in correlating these genetic data,[31] and which might provide some basis for postulating how these diverse groups arose.

Although the data are insufficient to validate any theory, Shaw maintained that his data supported a Migration-Dispersion model for the origin of these New Guinea population groups. According to this model, as individuals migrate in small numbers from a common gene pool, the new group becomes more distinct than the source group. This is so because new generations come from only a limited gene pool and are isolated from the normalizing effect of interbreeding within a large gene pool where all genetic factors are available. Genetic traits peculiar to the group are thus rapidly and strongly expressed because of a high degree of inbreeding.

It is postulated that "Papua-Melanesians" migrated to New Guinea in relatively large numbers. After settling on the coasts of what was probably an uninhabitated island, population growth forced these people to migrate up river valleys and into the highlands. These groups became reproductively isolated from one another due to geographic, linguistic and cultural barriers. This gave rise to populations that were genetically diverse from one another, since each migratory group had carried with it only a fraction of the total gene pool.

While evolutionists generally propose that the origin of races required gradual processes over a vast length of time, creationists postulate that a process similar to the one above could have caused the origin of races in a short period of time. The rapid dispersion that took place following the confusion of tongues at Babel[32] would have resulted in the isolation of relatively small groups. Furthermore, the manner in which God bestowed various languages among this previously monolingual human population may have been so directed as to isolate genetically similar individuals in the same language group.

Thus, those individuals having a higher proportion of genes for Negroid features, or for Caucasian features, etc., may have been given a common language. Once the race itself was established through isolation and inbreeding, further migrations and other isolating mechanisms, such as those described above, could account for the diversity within each major racial group.

**Pine Cone Spirals and the Fibonacci Series.** A curious, but seldom observed, pattern runs through much of nature.[33, 34] The reproduction of male bees, the number of spiral floret formations visible in many sunflowers, spiraled scales on pine cones and pineapples, the arrangement of leaves on twigs, and many other structures fit the Fibonacci series. This series, developed by the Italian mathematician Leonardo of Pisa, also known as Fibonacci (1170-1230), is 0, 1, 1, 2, 3, 5, 8, 13, 21, . . . , with each number the sum of the two previous numbers. Harry Wiant's study of the cones of the major southern pines confirmed that, almost without fail, the number of spirals around the cones at a selected point, to the right and left, were adjacent numbers in the Fibonacci series.[34]

Some exhibited counts of 5 and 8, others of 3 and 5. Preliminary studies indicated that approximately 50% of the cones give the maximum count to the right and 50% show the maximum to the left. Wiant suggested that these patterns in nature, in both the plant and animal world, rather than reflecting a random evolutionary process, are indicative of the design of a Creator-God.

**Stability of Bacterial Populations.** Basic to the orthodox evolutionary model is the belief that the population of an organism is constantly undergoing change due to mutations and pressures brought on by changes in the environment. Jerry Moore studied a pure culture of *Proteus micrabilis,* a bacterial species belonging to the Enterobacteriaceae family of the Eubacteriales order, which he had isolated from a clinical source, in order to determine its stability or variability over a period of time under markedly different conditions.[35]

The organism was serially transferred onto 10 randomly-selected laboratory media and the cultures were held at temperatures ranging from 20-37° C. for a period of three months. The conditions of culture and incubation were thus quite varied, yet remaining favorable enough at times for hundreds of bacterial generations to occur. After 62 serial transfers, 30 biochemical and anti-biotic sensitivity characteristics had not changed from those initially observed, except for a minimal and variable response to Penicillen G. The variable response to the latter may have been due to cell wall damage from exposure of the bacteria to noxious components in the culture media rather than to exposure to Penicillin G.

Moore's experiment, although admittedly limited in scope and duration, does support a natural biologic stability. In his paper, Moore reviewed some examples in the scientific literature of tremendous biologic stability, including a study which indicated that a bacterium had retained its rigid biological characterization during the 150 years it has been subject to investigation.

## NATURAL SELECTION

As mentioned earlier in this article, fundamental to evolutionary thinking is the concept that new varieties within each species are constantly arising via mutations or other genetic variations. The genetic variants that arise by these processes, due to differences in viability, fertility, etc., contribute, via reproduction, differentially to the gene pool of subsequent generations, some leaving more offspring than others.

Those that reproduce a larger proportion of offspring which, in turn live to reproduce in larger numbers, are said to be the most fit. They are said to have been selected by nature, and the evolutionary process is thus a process of mutation with natural selection.

Another concept that is fundamental to evolutionists is the belief that these minor changes, or micromutations, accumulate in such a way that one basic kind of an organism can change into a basically different kind of an organism, and simple organisms will change or evolve into more complex organisms.

Creationists recognize that all organisms have an ability to vary, but they insist that all empirical evidence indicates that this ability is restricted within relatively narrow limits, and that there is no evidence that one kind of an organism has ever arisen from a basically different kind of an organism. They further believe that this ability to produce normal variants (distinguished from pathological variants) was built into each kind by the Creator to enable each kind to survive under a great variety of conditions, and thus to be perpetuated even though conditions may change. Creationists are interpreting biological data according to this concept rather than within evolutionary concepts.

**Galapagos Island Finches.** Darwin and other evolutionists have supposed that the varieties of finches now living in the Galapagos Islands, a group of islands lying 600 miles and more west of South America, have arisen from migrants from South America. The original migrants, it is believed, were more or less uniform, but mutation with natural selection has given rise over a long period of time to finches that now inhabit the various islands and which possess differences (mainly in size and shape of the bill) in response to variations in the type of food supply found on the several islands.

Creationists interpret these data in much the same way, with some important exceptions. They point out, first of all, that the variation that has apparently occurred among these finches is very limited, for these finches are not only still birds, but they are still finches. Neither the molecule-to-man idea of evolution, nor the idea that basically different kinds of birds, such as ducks, humming birds, and vultures, have arisen from a common ancestor is supported by such evidence.

Secondly, creationists believe that the genetic potential, or gene pool, carried to the Galapagos Islands by the migrant finches from South America was sufficient to permit the variation that has occurred. This variability did not arise via mutations, but the potential was already present in the original migrants, which diverged into various forms as a result of the chance arrangement of their original variability potential (the fact that this variability potential existed was not by chance!).

Finally, as the study of these finches by Walter Lammerts[36] showed, the actual divergence that has occurred among these finches is considerably more limited than represented in much of evolutionary literature. Dr. Lammerts studied the large collection of Galapagos Island finches (sometimes called "Darwin's finches") at the California Academy of Science. He particularly noted: 1) the length of each bird from tip of bill to end of tail, 2) the height from belly to top of back, 3) total length of bill, and 4) width of the ventral side of the lower mandible of the bill.

These finches have been classified into four genera, *Geospiza, Camarhynchus, Cactospiza,* and *Certhidea.* Those studied by Lammerts bore 17 different species labels. While Lammerts held that the *Certhidea,* or Warbler finches, are distinctive from the other genera, he stated that the four species within this genera are hardly more than color variations, and should be placed in a single group with species rank rather than genus rank. Lammerts further observed that if all the species labels were removed from the remainder of the Galapagos Island finches and they were arranged according to body and bill size, complete integradation would be found. The same is true of bill length and width and plumage coloration.

Lammerts noted that the range in variation among these finches, although they are classified into several genera and many species, is exactly comparable to the variation found within a single species of song sparrow, *Melospiza melodia.* He further pointed out that these finch "genera" are in no way comparable in distinction to the genera *Rosa* (roses), *Frageria* (strawberries), and *Pyrus* (pears), members of the family Rosaceae.

Lammerts considered that it would be much more realistic to classify these finches into a single species. He also emphatically rejected the idea that the variations in size of bill are "adaptive divergences" resulting from natural selection. Present feeding habits, Lammerts emphasized, are the *result* of the particular types of bills which happened to occur among these birds, rather than the bills developing slowly as an adaptation to differences in the types of food available.

**Crowding and Reproductive Rates in Planaria.** E. N. Smith has reported on his study of the effect of crowding on asexual reproduction of the planaria *Dugesia dorotocephala.*[37]

As Smith pointed out, there are two possible mechanisms for regulating population densities. Individuals within a population might reproduce maximally near their physiological limit, with the population density being regulated by negative outside forces (predation, disease, starvation, etc.). Those individuals which are better able to compete against these outside forces and reproduce more offspring are said to be more fit and thus to be selected. Alternately, the individuals within a population might possess some internal regulating force which in some way regulates population density and maintains a form of density homeostasis.

Evolutionists generally prefer the former view. Natural selection is said to favor the individuals that can leave the most reproducing offspring. On the other hand, if the alternate view is correct, there would be no real competition between populations and no selection. The postulated cause of the evolutionary process would fail.

The freshwater planaria, *Dugesia dorotocephala,* reproduce asexually by fissioning. Smith maintained the planaria in identical containers, and conditions in each experiment were the same in each container, except the population density was maintained at

different levels. Smith found that crowding clearly reduced the fissioning rate of the planaria. This reduction did not appear to be due to slime, oxygen depletion or carbon dioxide build-up, but appeared to be due to some water-soluble inhibitor produced by the planaria.

The planaria thus appeared to have a built-in density-dependent reproduction regulatory mechanism. Smith postulated that these creatures (and other animals) regulate their own numbers without the necessity of outside forces such as predation, starvation, and disease. He pointed out that built-in density dependent reproduction rates were mandatory after creation and before the fall, and that it is quite conceivable that living organisms had a mechanism for regulating their numbers without intervention of external conditions such as predation, starvation and disease.

**Plant Succession Studies.** Walter Lammerts and George Howe used plant succession studies to observe the effect of natural selection under widely divergent conditions.[38] Repeated field analyses were made of variation in five plant species populations including the California poppy, lupine, thistle sage, owl's clover, and a yellow pansy, representing five different plant families. Observations were made over a period of five growing seasons at staked localities in the vicinities of Newhall and Corralitos, California.

Despite great variation in annual precipitation during the study, no gradual shifts or evolutionary trends were evident. The natural selection observed actually restricted the amount of variation, bringing populations back to a typical or normal form during years of moisture stress. Lammerts and Howe concluded that these studies indicated no evidence for natural selection of the type required by evolution theory.

Origin of the great range in variation found in many species of plants were discussed. It was the conclusion of one of the authors, namely Dr. Lammerts, that plant variations were supernaturally derived from the originally small populations of plants of the various kinds which survived the Flood. The alternative possibility exists, however, that a sufficiently diverse gene pool within each plant family survived the Flood to give rise to the many plant varieties existing today. The experiments by Howe discussed in the next article have shed some light on this question.

## GENERAL BIOLOGY

**Seed Germination and Plant Survival Following Submersion in Salt and Fresh Water.** George Howe undertook a study of the effect of prolonged submersion of seeds of flowering plants in sea and fresh water as an aid in understanding how plants were able to survive the Flood.[39] Seeds from the fruits of five different species and families of flowering plants were tested for germination after soaking in sea water, fresh tap water, and an equal mixture of sea and tap water.

Soaking was continued for a maximum of 140 days, which corresponds roughly to the 150 days during which water prevailed upon the earth during the Flood. At intervals of 4, 8, 12, 16, and 20 weeks after initiation of soaking, seeds of each plant species were removed from the various treatments and placed under favorable germination conditions.

Ability to survive the soaking varied among the plant species tested, but even after a soaking period of 140 days in each of the solutions mentioned above, seeds from three out of the five species tested germinated and grew.

The first suggestion that Howe made in answer to the question of plant survival during the Flood was that many plants did not survive! He pointed out that much destruction of plant life would be expected during a prolonged global flood and that extinction of many species would thus be a predictive consequence of such a flood. Paleobotanical studies have revealed that numerous kinds of plants are found as fossils but which are not found living today.

Howe reviewed several other mechanisms for plant survival during the Flood in addition to resistance to soaking by seeds. Vegetation, including trees, have been known to have been torn away by storms and carried out to sea still embedded in soil masses. Survival during prolonged periods of such a process would be possible.

Plant material has been known to have been transported while embedded in icebergs. Seeds that were contained in the carcasses of dead birds floating in sea water have been known to germinate and grow. No doubt many seeds would have been carried on the ark, as well.

From his data and that of others, Howe concluded that a variety of mechanisms were available to account for the survival of plants during the Flood.

**Flora and Fauna of the Galapagos Islands.** John Klotz visited the Galapagos Islands, made famous by Darwin, and has published an extremely interesting review of the plants and animals which now inhabit these islands, particular attention being given to finches, tortoises, cacti, and iguanas.[40]

About a half dozen of these islands measure 10 to 20 miles across, and one, Albemarle, is 80 miles along. Mountains on these islands rise 2,000 to 3,000 feet above sea level, the highest point being 4,000 feet on Albemarle. Generally the islands are arid and the landscape harsh. Inland and at higher altitudes, there is humid forest with rich black soil and tall trees covered with ferns, orchids, lichens, and mosses. In the very highest areas there is open country with grass, ferns, mosses, and occasional thickets.

Floral and faunal types are relatively few in number. The fauna include only six passerine forms of birds and one species of cuckoo; two types of land mammals (a bat and a rat); and five types of land reptiles, which include a giant tortoise, a lizard, a gecko, a snake, a land iguana, and a marine iguana. There are no amphibians. Domesticated animals have been introduced by settlers.

Klotz devoted a large section of his paper to the finches. He stated that there seems to be no reason to question their origin from a common ancestor. As Klotz noted, evolutionists have generally assumed the origin of all the finch species from a single gravid female, a single pair, or at most a very small number reaching the islands together. Klotz discussed the suggestion of Lammerts (1966), mentioned earlier in this

paper, that migration of finches to the Galapagos Islands might have included many pairs, although he did not seem to favor that view.

Klotz, in contrast to Lammerts, maintained that most of the Galapagos Island finch species are actual species rather than mere varieties. There seems to be good evidence on each side, although Lammerts presented some especially convincing evidence. Klotz believes there is no reason to doubt that new species arise or that new species of finches actually did arise on the Galapagos Islands.

Klotz emphasized that origin of species is comparatively only a minor problem for evolutionists. Finches are still finches and there is no evidence of the changes in magnitude required for macroevolution, that is, increase in complexity with origin of one basic kind from another. He thus asserted that the evidence presented by the fauna and flora of the Galapagos Islands did not constitute any real support for amoeba-to-man evolution.

## TAXONOMY

**Molecular Approaches to Taxonomy.** Taxonomy is the science of classification of plants and animals. It is obvious that there are recognizable groups of organisms in the present world which have many similar characteristics. Such groups have always existed as evidenced both by the fossil record and the Genesis reference to "kinds." The father of taxonomy, Carolus Linnaeus, was a strong believer in creation, and believed, as do modern creationists, that similarities among organisms exist not because of their origin from a common ancestor but because God based His creation on a complex of plans with an underlying thread of unity.

Wayne Frair's approach to taxonomic studies avoids evolutionary presuppositions, his assumption being that the world of life is to be viewed as having risen from certain stem organisms which constitute the original "kinds" mentioned in Genesis. He views the problem of grouping organisms within the kinds and of establishing relationships among the kinds to be the proper function of taxonomists.

Frair's interests as a biologist have included serology and herpetology. He combined elements of both in his taxonomic studies, utilizing antibodies to the serum of turtles as an aid in establishing the taxonomic relationship of these turtles.[41] He injected the blood sera of the turtles into rabbits or chickens in order to establish antibodies to the serum proteins. The antibody-containing serum, or antiserum, was obtained from the rabbits or chickens and mixed with serial dilutions of the serum from the various turtles. The sera from closely related turtles would be expected to give a strong cross-reaction, while sera from distantly related turtles would cross-react weakly or not at all (a cross-reaction is said to be obtained if antiserum generated by injection of serum of species A also reacts, or gives a precipitate, with serum from species B).

Frair's studies did not support the widely held view that snapping turtles belong to a separate family related to the Kinosternidae, but rather should be placed within the Emydid family group. Such a switch is probably minor enough to pose no problem for the evolutionary biologists. Creationists maintain, of course, that taxonomic classification should be established without reference to a supposed evolutionary origin or phylogeny, but should be based strictly on degree of similarity.

## THERMODYNAMICS

Many papers have been published in the *CRS Quarterly* which were concerned with the relationship of the laws of thermodynamics to the creation-evolution problem. Emmett Williams, in his most recent paper on this subject, presented an excellent review of the papers on this subject.[42] To review these papers here, or even to review in detail Dr. Williams' outstanding series of papers on this subject[43-46] would exceed the scope of this paper. To omit any mention of this work from the present paper, however, even though such work did not involve collection of any new and original data as such, would be a serious omission. I will, therefore, briefly review Williams' series of papers.

Those who hold to the general evolution model postulate that the present universe and all that it contains began in some primordial disordered state. Evolutionary forces have been at work throughout the billions of years since that state existed, it is believed, and have acted in such a way that the highly structured universe and a vast array of incredibly complex organisms have arisen here on the earth. Thus, there has occurred, according to this thinking, at least in the observable part of our universe and particularly on the earth, an immense increase in order and complexity. This supposedly has taken place solely according to mechanistic, naturalistic processes which can be attributed to properties inherent in matter.

If the above were true, then matter obviously must have possessed an inherent ability for organization into higher and higher levels of order and complexity. Scientists should have been able to recognize this universal inherent property of matter and to construct natural laws which describe it. As a matter of fact, scientists have **not** been able to recognize any such property of matter.

However, scientists have recognized just the opposite tendency in matter. The more probable state of matter is always the more random state. Every change in nature that takes place *spontaneously* always results in a *loss* of order. Natural processes always occur in such a way that the complex tend to become less complex, ordered states tend to become disordered. Therefore, this universe is constantly becoming more disordered.

This tendency is so universal and so unfailing it can be expressed as a law—the Second Law of Thermodynamics. The operation of the natural forces which has resulted in man's description of these forces in the form of the Second Law of Thermodynamics has a number of consequences, and thus the Second Law may be defined in several ways. These consequences include the loss of usable energy, the loss of order, and the loss of information. The Second Law may thus be defined in several ways so as to emphasize these several consequences. In discussions of this Law and its relationship to the creation-evolution problem, the

loss of order and information consequences are usually emphasized.

In Williams' first paper on this subject,[43] he discussed the operation of the Second Law from the viewpoint of classical thermodynamics (loss of usable energy) and the viewpoint of statistical mechanics (loss of order). Entropy is a thermodynamic quantity which can be defined, in a non-technical sense, as a measure of the randomness of a system—the greater the randomness or disorder within a system the greater the entropy.

An increase in order requires a decrease in entropy, while the reverse is true. The Second Law of Thermodynamics is thus sometimes referred to as the law of increasing entropy. In his first paper, which was the more technical of the series, Williams discussed entropy and the solid state.

Following an excellent introduction, including a thorough definition of terms and of the Second Law in thermodynamic and statistical terms, Williams discussed the effect of entropy on the solid state. Contrary to what is commonly believed, crystalline solids are not structurally ordered. There are many imperfections in the lattice structures of such solids, and these imperfections are thermodynamically stable because the entropy of the solid is increased by their presence. Williams emphasized that the principle of increasing entropy is opposed to evolution and to certain aspects of ruin-reconstruction interpretations of Genesis 1.

A simplified explanation of the First and Second Laws of Thermodynamics was given in non-mathematical language in Williams' second paper.[44] That the total amount of energy in the universe is a constant is expressed in the First Law. Since matter and energy are interchangeable, and therefore equivalent, everything in the physical universe is a form of energy and neither increases nor decreases, in perfect agreement with the Biblical pronouncement of a finished creation. Williams explained that evolution could not have occurred unless both the First and Second Laws of Thermodynamics were violated many times. He shows that the three arguments which are usually offered by evolutionists to circumvent the laws of thermodynamics are invalidated by the evidence.

In his third paper[45] Williams asked the question, "Is the universe a thermodynamic system?" One would have to know the answer to that question before one could assert with authority that the laws of thermodynamics apply to the entire universe in addition to our readily observable portion of the universe, where these laws have been tested. Williams asserted that there is no way scientifically to determine the extent of the universe or its thermodynamic character at the present time.

He pointed out, however, that statements in Scripture support the fact that the laws of thermodynamics do apply to the entire universe. The applicability of the First Law is asserted in Genesis 2:1-3 and in II Peter 3:7, and the applicability of the Second Law is made plain in Psalms 102:25, 26, and Romans 8:20-22. Since the universe is subject to these laws of thermodynamics, and no matter or energy exchange can be observed, it is *assumed* that the universe is an isolated thermodynamic system.

But whether the universe is open, closed or isolated, it is definitely degenerating. No matter what type of a thermodynamic system is chosen, the entropy of the system always increases with the occurrence of an irreversible process. Williams therefore asserted that evolutionists, who demand a decrease in entropy, are in an indefensible position in the face of the Second Law of Thermodynamics.

In his fourth paper,[46] Dr. Williams offered an extremely interesting and thorough consideration of the applicability of the laws of thermodynamics to living systems. There is a rather general impression, often stated by evolutionists, that living systems somehow circumvent the Second Law, since the development of a seed or fertilized egg into the adult organism seems to result in an increase in complexity.

As Williams pointed out, this increase in complexity is only apparent and not real. The fertilized egg is as complex, or more so, than any cell in the growing or adult organism. All of the information needed for the production of the adult is present in the egg. No new information is needed or added. As a matter of fact, almost from the moment of conception, loss of information and order via mutations, injuries, and disease begins. This loss of order, or the rate of increase in entropy, slows during development, but never ceases.

The rate of entropy increase accelerates during the aging process and finally results in death, whereupon the organism reaches its maximum entropy state—a pile of dust. If living things circumvented the Second Law of Thermodynamics, they would live forever.

As indicated early in this section, Williams' most recent paper (1973) on thermodynamics in the *CRS Quarterly* was a review of creationist literature on the relationship of the laws of thermodynamics to the subject of creation and evolution. Publications by Henry M. Morris, R. E. D. Clark, D. Penny, T. G. Barnes, George Mulfinger, Walter Lammerts, I. McDowell, Bolton Davidheiser, G. C. Lockwood, and A. E. Wilder-Smith were cited in this respect. Dr. Williams concluded his 1973 paper with a discussion of evolution in the light of probability considerations, showing that evolution, on the basis of these probability considerations alone, can be shown to be impossible.

## A RESEARCH CHALLENGE

In 1970, Larry Butler, then Chairman of the Research Committee of the Creation Research Society, issued a research challenge to creationists in the form of a list of proposed research projects.[47] These included:

(a) experimental demonstration that coal can be formed rapidly under catastrophic conditions (This has actually been demonstrated since then by a University of Utah scientist—see reference 17.);

(b) experimental formation of fossils under a variety of conditions in order to demonstrate that fossilization can take place relatively rapidly;

(c) experimental determination of optimum conditions for rapid growth of coral reefs; investigation of caves, mine shafts, and tunnels of recent origin (100-

200 years) to determine growth rates of stalactites and stalagmites;

(d) anthropological measurements of variations in thickness, shape, etc., of contemporary human skulls.

Other suggested research included:

(a) consideration of the thermodynamic effects of the Flood;

(b) surveys of geological formations from high altitude (40,000 feet) and interpretations of the broad features revealed within the context of Flood geology;

(c) continuation of Howe's investigation of the effect of soaking in sea water on the viability of seeds;

(d) a reinvestigation of alleged examples of species formation;

(e) further research to verify the claim that radioactive decay of uranium and thorium has actually produced only a minute fraction of the helium that should have been produced in 4.5 billion years.

Further projects listed were:

(a) research to determine the true origin of cultivated plants;

(b) carbon dating of samples of organic material that is supposed to be millions of years old and which should thus be devoid of radiocarbon (C-14);

(c) taxonomic studies in an attempt to determine the limits of the "kinds" described in Genesis;

(d) a formulation of a list of "living fossils," that is, a list of plants and animals once believed to have been extinct for millions of years but now known to be living;

(e) finally an investigation of settling rates to see if differential settling by water action, as proposed by Whitcomb and Morris,[48] can account for the way fossils are distributed in the geological formations.

The list of proposals by Dr. Butler is certainly not exhaustive, of course. For instance, there is the need for: (a) Dr. Barnes to continue his fascinating study of the magnetic field of the earth, (b) a continued need for the search for remains of the ark on Mount Ararat, (c) further investigations of alleged overthrusts, (d) research into the processes and procedures used in radiometric dating, etc.

Butler nevertheless posed a real challenge to creation scientists; and he gave some idea of the important need for creationist research and the possible direction of such research. As is evident from this review, creationists have not been idle during the past decade, and readers can expect that creation scientists will have gained significant insight into many of the problems posed by Dr. Butler before the end of the present decade.

## References


[1]Creation Research Society, 2717 Cranbrook Road, Ann Arbor, Michigan 48104. This is a non-profit organization incorporated in the State of Michigan.

[2]Slusher, H. S. 1966. Supposed overthrust in Franklin Mountains, El Paso, Texas, *Creation Research Society Quarterly*, 3 (1):59-60.

[3]Lammerts, W. E. 1966. Overthrust faults of Glacier National Park, *Creation Research Society Quarterly*, 3 (1):61-62.

[4]Burdick, C. L. 1969. The Lewis overthrust, *Creation Research Society Quarterly*, 6 (2):96-106.

[5]Burdick, C. L. and H. S. Slusher. 1969. The Empire Mountains--a thrust fault?, *Creation Research Society Quarterly*, 6 (1):49-54.

[6]Lammerts, W. E. 1972. The Glarus overthrust, *Creation Research Society Quarterly*, 8 (4):251-255.

[7]Rusch, W. H., Sr. 1971. Human footprints in rocks, *Creation Research Society Quarterly*, 7 (4):201-213.

[8]Films for Christ, Route 2, Eden Road, Elmwood, Illinois 61249.

[9]Meister, W. J., Sr. 1968. Discovery of trilobite fossils in shod footprints of human in "Trilobite Beds"—a Cambrian formation, Antelope Springs, Utah, *Creation Research Society Quarterly*, 5 (3):97-102.

[10]Burdick, C. L. 1973. Discovery of human skeletons in Cretaceous formation, *Creation Research Society Quarterly*, 10 (2):109-110.

[11]Cousins, F. W. 1966. Fossil man. Evolution Protest Movement. 110 Havant Road, Stoke, Hayling Island, Hants, England; and 1557 Arrow Road, Victoria, British Columbia, Canada. Pp. 47-61.

[12]Burdick, C. L. 1966. Microflora of the Grand Canyon, *Creation Research Society Quarterly*, 3 (1):38-50.

[13]Burdick, C. L. 1972. Progress report on Grand Canyon palynology, *Creation Research Society Quarterly*, 9 (1):25-30.

[14]Rusch, W. H., Sr. 1968. The revelation of palynology, *Creation Research Society Quarterly*, 5 (3):103-105.

[15]Burdick, C. L. 1967. Ararat—the mother of mountains, *Creation Research Society Quarterly*, 4 (1):5-12.

[16]Coffin, H. G. 1969. Research on the classic Joggins petrified trees, *Creation Research Society Quarterly*, 6 (1):35-44.

[17]Gish, D. T. 1972. *Acts and Facts*, 1 (4):1-4. (Institute for Creation Research). 1973. *Creation: Acts, Facts, Impacts* Creation-Life Publishers, San Diego), pp. 15-19.

[18]Coffin, H. G. 1974. (in) *Challenge to Education* II-B. The Bible-Science Association, Caldwell, Idaho, pp. 36-41.

[19]Northrup, B. E. 1969. The Sisquoc diatomite fossil beds, *Creation Research Society Quarterly*, 6 (3): 129-135.

[20]Peters, W. G. 1971. The cyclical black shales, *Creation Research Society Quarterly*, 7 (4):193-200.

[21]Nevins, S. E. 1972. Is the Capitan limestone a fossil reef?, *Creation Research Society Quarterly*, 8 (4):231-248.

[22]Nevins, S. E. 1974. Post-Flood strata of the John Day Country, Northeastern Oregon, *Creation Research Society Quarterly*, 10 (4):191-204.

[23]Barnes, T. G. 1971. Decay of the earth's magnetic moment and the geochronological implications, *Creation Research Society Quarterly*, 8 (1):24-29.

[24]Barnes, T. G. 1972. Young age vs. geologic age for the earth's magnetic field, *Creation Research Society Quarterly*, 9 (1): 47-50.

[25]Barnes, T. G. 1973. Electromagnetics of the earth's field and evaluation of electric conductivity, current, and joule heating in the earth's core, *Creation Research Society Quarterly*, 9 (4):222-230.

[26]Barnes, T. G. 1973. The origin and destiny of the Earth's magnetic field. The Institute for Creation Research, San Diego.

[27]Lammerts, W. E. 1965. Planned induction of commercially desirable variation in roses by neutron radiation, *Creation Research Society Quarterly*, 2 (1):39-43.

[28]Lammerts, W. E. 1967. Mutations reveal the glory of God's handiwork, *Creation Research Society Quarterly*, 4 (1):35-41.

[29]Lammerts, W. E. 1969. Does the science of genetic and molecular biology really give evidence for evolution?, *Creation Research Society Quarterly*, 6 (1):5-12.

[30]Tinkle, W. J. 1971. Pleiotropy: extra cotyledons in the tomato, *Creation Research Society Quarterly*, 8 (3):183-185. (See also a relevant article in this issue.)

[31]Shaw, R. D. 1972. Why genetic variation between New Guinea communities (Migration—dispersion model applied), *Creation Research Society Quarterly*, 9 (3):175-180.

[32]Genesis 11:1-9.

[33]*Time* (April 4, 1969), pp. 48 and 50.

[34]Wiant, H. V. 1973. Relation of southern pine cone spirals to the Fibonacci series, *Creation Research Society Quarterly*, 9 (4):218-219.

[35]Moore, J. P. 1974. A demonstration of marked species stability in Enterobacteriaceae, *Creation Research Society Quarterly*, 10 (4):187-190.
[36]Lammerts, W. E. 1966. The Galapagos Island finches, *Creation Research Society Quarterly*, 3 (1):73-79.
[37]Smith, E. N. 1973. Crowding and asexual reproduction of the planaria, *Dugesia dorotocephala*, *Creation Research Society Quarterly*, 10 (1):3-10.
[38]Lammerts, W. E. and G. F. Howe 1974. Plant succession studies in relation to micro-evolution, *Creation Research Society Quarterly*, 10 (4):208-228.
[39]Howe, G. F. 1968. Seed germination, sea water, and plant survival in the great Flood, *Creation Research Society Quarterly*, 5 (3):105-112.
[40]Klotz, J. W. 1972. Flora and fauna of the Galapagos Islands, *Creation Research Society Quarterly*, 9 (1):14-22.
[41]Frair, W. 1967. Some molecular approaches to taxonomy, *Creation Research Society Quarterly*, 4 (1):18-22.
[42]Williams, E. L. 1973. Thermodynamics: a tool for creationists (Review of recent literature), *Creation Research Society Quarterly*, 10 (1):38-44.
[43]Williams, E. L. 1966. Entropy and the solid state, *Creation Research Society Quarterly*, 3 (3):18-24.
[44]Williams, E. L. 1969. A simplified explanation of the laws of thermodynamics, *Creation Research Society Quarterly*, 5 (4): 138-147.
[45]Williams, E. L. 1970. Is the universe a thermodynamic system?, *Creation Research Society Quarterly*, 7 (1):46-50.
[46]Williams, E. L. 1971. Resistance of living organisms to the second law of thermodynamics: Irreversible processes, open systems, creation, and evolution, *Creation Research Society Quarterly*, 8 (2):117-126.
[47]Butler, L. G. 1970. A research challenge, *Creation Research Society Quarterly*, 7 (2):88-89.
[48]Whitcomb, J. C. and H. M. Morris 1964. The Genesis Flood. Presbyterian and Reformed Publishing Co., Philadelphia.

## CREATIONISM, SCIENCE, CORRUPTION

A vision which the prophet Amos saw may have meaning for creationists. He reported: "I saw the Lord standing upon the altar, and He said, 'Smite the lintel of the door . . .'."[1] The meaning, it appears, is that there may come a time when religion will be so corrupt that God will tear it down and start over. Of course, such a thing happened once to more than just religion; it happened to the whole world at the time of the Flood.

Moreover, God might see fit to deal thus with any human activity or institution, as well as with religion. For: ". . . judgement must begin at the house of God: and if it first begin at us, what shall the end be of them that obey not the gospel of God?"[2]

That science is a human activity or institution, everyone would agree. That there are signs of corruption in it here and there, few would be able to deny. The faults mostly go back to that pride—what the Greeks called "hubris"—which hates to be subject to God. Evolutionary theorists, who try to avoid the need of a Creator, are obvious examples of this fault. (There are others; there are, for instance, certain developments which can hardly be called anything other than corruptions of medicine.)

Those, then, who are concerned for the future of science should be glad for the creationist movement. For spokesmen aim, in the last analysis, to prevent or remove some of this corruption. Just as Christianity is to be the salt of the earth[3]—and one job of salt is to prevent corruption—so creationism could be the "salt" of science.

All this, of course, will mean nothing to those who do not believe the Gospel at all. But there are many who consider themselves to be Christians (and in this I do not argue with them; it is not for me to judge someone else as servant[4]), and who are interested in science, but who seem to have little use for creationism.

Such people, especially, might do well to consider the points which have just been made. There may be some things which they do not like about the way in which creation is sometimes presented. Just so, there were those who objected, about 200 years ago, to the way in which the Wesleys and their associates presented their message. Yet many believe that it was the Wesleys' work, more than any other human action, which saved England from disaster at that time.

Let it be considered, then, whether creationism may be what is needed to save science from disaster.

### References

[1]Amos 9:1.
[2]1 Peter 4:17.
[3]Matthew 5:13.
[4]Romans 14:4.

—Contributed by Harold Armstrong

## LEAFLET ON PILTDOWN MAN HOAX

It is reported, in *Nature*, Volume 247 (5437):130, that the British Museum, London, England, has published a leaflet, "The Piltdown Man Hoax." This is Palaeontology Leaflet 1, No. 2, has six pages, and costs seven pence, about seventeen cents.