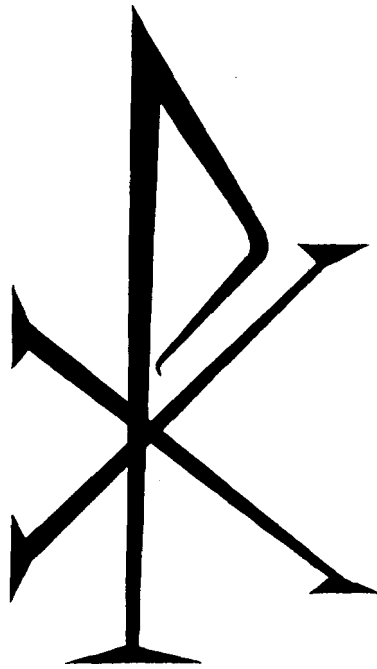


CREATION RESEARCH SOCIETY

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

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EDITORIAL COMMENTS

Dr. Wayne Frair's careful research into the exact nature of the human skull presumably fossilized in brown coal, though not as exciting as the finding of human foot prints in the Cambrian, is fully as important. His conclusion that the skull is an artistic fabrication is disappointing to those who accepted the validity of its report in Otto Stutzer's 1940 edition of *Geology of Coal*. However, it is most important that we be fully informed.

Dr. Evan Shute presents a remarkable series of identical biochemical entities found in organisms widely separated taxonomically. Either these arose independently or they are residual evidences of descent from a common ancestor. If they occurred independently by mutation, their chemical identity is difficult to explain. If they are residual chemical identities tracing back to a common ancestor, it is equally strange that only the semi-aquatic salamanders of the genus *Taricha* and the puffer fish have the highly poisonous tarichatoxin. Why was this toxic poison lost in all "related" genera and families?

Offhand one would not suppose that laws of physics had much relation to the evolution theory. Yet Dr. Emmett Williams clearly shows that unless both the first and second law of thermodynamics were violated many times, evolution simply could not have occurred, or be continuing. Thus Moore, Lalicher and Fischer say in their *Invertebrate Fossils* (McGraw-Hill Co., 1952, p 343), "(In cephalopods) attainment of buoyancy compensates for weight of increased shell thickness. The cephalopods developed along the latter line by installing buoyant gas chambers in the shell, separated by walls (septa), and connected with the body by a tube, the siphuncle." Surely this is postulating an evolution contrary to the second law of thermodynamics. Incidentally, which came first, the thickened shell or the buoyant chambers?

Dr. William Tinkle points out that evolution by natural selection appealed to the crude and selfish capitalists of Darwin's era. As he points

out, since artificial selection soon reaches limits, so would natural selection. It would seem that, after more than 100 years, at least a few cases could be established indicating that natural selection had completely changed a population to the presumably advantageous mutated type. Yet all we read about in population genetics are trends; -and there are still grey moths among the predominantly black moths near manufacturing cities of England. The article by Dr. Bolton Davidheiser provides many specific points on the dangers of Social Darwinism.

I have given considerable space to a presentation of reasons why Bob Jones University is not accredited. Let us hope that creation-oriented Christian colleges may one of these days form an association, and set up their own standards of accrediting.

The most interesting item of Harold Armstrong's "News and Views" to me is his discussion of how rapidly "Angelstone" is formed. Certainly it would seem that, given the right conditions of heat and intense pressure, rock could be formed rapidly during and after the Flood.

His article on conservation is most timely and brings to our attention the many failures of our much vaunted scientific age with its resultant overemphasis on freeways and mechanization generally. I am particularly sympathetic to his mention of the modern cruel way of keeping egg laying hens.

May I again urge all our members, and especially those who are scientists, to continue sending in papers. Our 1969 Annual will be devoted to a careful examination of the so-called major lines of evidence for evolution and uniformitarian concepts in geology. There is a wide field here for all trained in the various scientific disciplines to contribute. We wish to have pertinent articles from as many different members as possible.

WALTER E. LAMMERTS
Editor

ERRATA

Another correction has been noted for the September, 1968, *Quarterly*. On page 82, under "The potassium-Argon Timeclock," the last sentence in the third paragraph should read: "It was then found that K-40 decays simultaneously in two ways, 92% of the decay being beta emission to yield Ca-40, and 8% being by isomeric transition and gamma emission to yield Argon-40."

Also in that same *Quarterly*, in Chart 1 on page 79, the total time from Creation to the present should be approximately 6938 years, as an additional change beyond those printed as errata on page 126 of the December, 1968, *Quar-*

terly. Professor Robert Whitelaw provides a further note on why the time from Exodus to the Temple show be 580 years in the same Chart 1:

Despite the "480 years" cited in the Hebrew text of 916 A.D. in 1 Ki. 6:1, the LXX, the Sam. Pent., the Deas Sea Scrolls, and other sources including the cumulative years of Joshua, Judges and Samuel, all disagree. This has been a knotty problem for centuries, and the best evangelical scholars who have studied the problem in depth, *e.g.*, Anstey, Mauro, *et al.*, all agree on a period between 580 and 620 years, with supporting evidence.

COMMENTS FROM THE PRESIDENT

I have just returned from a pleasant trip to Bryan College in Dayton, Tennessee, a very fine Christian liberal arts college still faithful to the Word of God and to Biblical creationism.

As many of our readers know, this school was founded in 1925 at the time of the famous Scopes trial in Dayton, at which creationism and evolutionism battled in the glare of a national spotlight. The school was named after William Jennings Bryan, who was the attorney for creationism in the trial, and who died five days after its conclusion.

In the light of subsequent history, despite the noble efforts of Bryan and his colleagues and despite the fine continuing testimony of the school, the over-all effect of the trial and its attendant publicity proved sadly detrimental to creationism. Although teacher Scopes was found guilty of breaking Tennessee's anti-evolution law, the national consensus was that the theory of evolution had won the battle.

Christians, in general, soon quit fighting evolution in any organized, scholarly fashion, and for the most part even fundamentalists retreated from the fray, content to pigeon-hole all the evolutionary geological ages into a supposed gap between Genesis 1:1 and 1:2, thus hoping to ignore the whole problem.

Evolutionists have continued to use the Scopes trial as a propaganda weapon, however. A never-ending stream of books, newspaper and magazine articles, and even movies have made the trial almost synonymous with the triumph of science over fundamentalist obscurantism. Creationists are continually attacked, never with scientific facts but rather with ridicule, opinions and pronouncements of supposed authorities.

In the February, 1969 issue of *Scientific American*, the lead article "The End of the Monkey War" rehashes the Scopes trial once again, and in the same tone. The author, L. Sprague de Camp, concludes:

The Scopes trial, although legally inconclusive, helped to end the monkey war. It created an enormous revival of popular interest in evolution. Furthermore, Darrow's verbal manhandling of Bryan had not made the anti-evolution crusade any more attractive. Politicians drew back from the "Adamist" movement, if not for love of science, then for fear of ridicule.

It seems to me that there are two important lessons for modern creationists to learn from the Scopes trial. First, the legal and political arena is not the proper place for this battle to be fought. We can dissipate much time and energy this way and, in the present climate of educat-

ional and judicial opinion, such efforts are almost certain to do more harm than good.

The press, both popular and scientific, inevitably will present the evolutionists' case in a more favorable light, regardless of the facts involved. At the Scopes trial, the actual evidence presented by Clarence Darrow and his witnesses "proving" evolution, was essentially nothing but the fact that all the authorities accepted it. Their factual evidence was sometimes absurd—it was in this trial that the famous *Hesperopithecus* tooth was presented as that of an ancient ape-man, though actually it belonged to an extinct pig! But the popular reports all sounded like the evolution theory had been scientifically demonstrated.

The second lesson to be drawn from the Scopes trial is the fatal mistake of any sort of compromise on the issue of the geologic ages. Bryan's case was lost when he advocated on the witness stand (against the advice of the most competent among his scientific advisers) the "day-age theory" of the Genesis record of creation, thus accepting the geologic ages.

As most of our readers are aware, the geologic ages and their fossil record are based on evolution and also provide its chief evidence. The day-age theory is thus merely a semantic variant of theistic evolution. The entire issue essentially dissolved when Mr. Bryan took this position, and his cause was soon lost.

The fine research study described by Wayne Frair in our lead article in this *Quarterly* is marred by this same implicit acceptance of the standard geologic ages. There would be no reason to be surprised at human remains found in coal formations if the Biblical chronology, rather than the supposed geologic time-scale, is the true framework of history.

The opinion of the various authorities consulted by Dr. Frair that the skull under discussion was a carving rather than a true fossil likewise may have been based on their implicit acceptance of these geological ages rather than on real evidence, since no such evidence was cited by them. It would help to know whether actual physical evidence exists that the skull was carved, or whether this opinion may have been influenced by subjective considerations. Anthropologists' opinions are not always completely reliable—witness *Hesperopithecus*, Piltdown, et al!

Remaining unanswered is the question as to why those who first examined and described the skull (before Darwin's day) were convinced it was a true skull and also, why, if it is an artifact, no others like it have been found in archaeologi-

(Continued on Page 147)

THE HUMAN SKULL COMPOSED OF COAL

WAYNE FRAIR*

The human skull reputedly fossilized in brown coal has been found to be an artistic fabrication. An appreciation of the status of this artifact removes an obstacle to our arriving at a better understanding of man's relationship to other organisms in the creation, as shown by the fossil record.

Introduction

The significance, for a proper understanding of creation and evolution, of a human skull composed of coal, hardly can be over estimated. In presenting a brief for evolution in 1959, geneticist Prof. J.B.S. Haldane¹ published the following:

. . . one can make a list of dozens of discoveries, any one of which would go far to disprove the theory of evolution. For example, if the skeleton of a man or a horse were discovered in the Cretaceous, or that of a reptile or a bird in the Devonian, I, for one, would regard most of my life's work as having been as futile as that of an astrologer. (p. 711)

A human coal skull without apparent doubt belongs in the evolution-disproving category; for according to uniformitarian geologists, coal was formed many millions of years before man was on earth.

For those who hold a flood geology position which includes a concept of coal formation and deposit of all fossils within the last 10,000 years, such a skull presents no problem. In fact, according to this position we might expect to find a variety of such fossils which truly are anomalous according to a concept of geological ages. If no human remains have been found in coal beds, man may not have been present when and/or where the coal was formed. Therefore an understanding of the status of an artifact such as a coal skull is a help in our determining the pattern of creation.

Background Literature

The existence of a coal skull in Germany was brought to public attention recently by Whitcomb and Morris²; and others such as Heil³ have mentioned it subsequently. The work describing the skull in English is by Otto Stutzer,⁴ who said:

Animal remains in coal beds are extremely rare. The animals which once inhabited the great coal swamps were terrestrial forms, the bodies of which decomposed after death just as rapidly as do the bodies of animals living in existing primitive forests and moors. In the coal collection of the Mining Academy in Freiberg there is a puzzling human skull composed of brown-coal and mangiferous and

phosphatic limonite, but its source is not known. This skull was described by Karsten and Dechen in 1842. (p. 271)

The 1842 paper was authored by a Mr. Kersten⁶ (journal editors were Karsten and Dechen) who described briefly a seven pound skull about as hard as talcum. This skull had been obtained by a mining engineer named Mr. Leschner from the estate of a deceased pharmacist, and the skull had been shown by Leschner at a meeting of a local mining club.

Kersten analyzed the skull's chemical components and reported that pieces which crumbled off the skull showed it to be composed of approximately one half brown iron ore (iron and manganese oxides rich in phosphoric acid) and one half organic brown coal (lignite). The organic matter of the skull was closer to lignite than to peat. Under a magnifying lens there was no trace of bone substance.

Kersten concluded that all animal matter had disappeared from the original substance of the skull, and he suggested that the skull in some way had come into a brown coal mine or similar location and that here the changes took place. He gave his opinion about the chemical processes which could have been involved, but did not suggest when this may have occurred.

Professor Stutzer's Work

The German professor Otto Stutzer lived from 1881-1936. In 1923 the second edition of his book entitled *Allgemeine Kohlengologie (General Coal Geology)* was published. In a footnote on page 274 the puzzling coal skull is mentioned.

Four years later Stutzer⁶ published a more detailed write-up on this skull. This reference was obtained through the generous help of Dr. W. W. Howells, Harvard Professor of Anthropology, and his German friend, Dr. G. Smolla. Translation was done by Mr. Wolfram Graber of the German Department at The King's College. A translation of the entire report follows:

The "brown coal skull" in the geological collection of the Academy of Mining, Freiberg (Saxon). In the geological collection of the Freiberg Mining Academy a brown coal skull has existed for almost a century, already having been described as early as the year 1842 in Karstens *Archiv* (vol. 16, pages 372-375). In my *General Coal Geology* (2nd ed., p. 274) this "puzzling" piece also has been mentioned in a footnote.

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The head has the shape of a human skull. It consists of brown coal matter, limonite and triplite. Our institution received the piece from the collection of a deceased pharmacist; the original source is unknown. The description which was published more than 80 years ago assumed that the skull somehow fell into a bog* in which its cavities were filled with peat. At the same time the bone substance was replaced by phosphorus containing limonite and triplite. The organic embedding mass is brown coal and not recent peat; the analysis performed at that time led to this conclusion.

Naturally it would be valuable to investigate the object for its authenticity and its age, since it indeed could be the valuable remains of a primitive man. However, a close examination revealed unfortunately that this skull is a skillful fake. For the sake of safety the head was sent to the ethnographic division of the Zwinger Museum in Dresden with the request for expert opinion. This competent institution immediately ascertained that it is a fake, which is to say a skull molded from brown coal mixed with limonite and triplite, Dr. Otto Stutzer, Freiberg (Saxon).

In 1936 Professor Stutzer visited the United States, and he discussed translation and established plans for cooperating with chief translator, Dr. Adolph C. Noe, in preparing an English edition of his *Allgemeine Kohlengeologie*. However, Professor Stutzer died later that same year. Dr. Noe proceeded with the translation, but he died in 1939 before its completion. The manuscript was finished by scientific associates of Dr. Noe. The University of Chicago Press published the work and their files indicate that Dr. Gilbert H. Cady was the last person with whom they corresponded with regard to the book. In the preface of the English translation, an explanation is offered that the book is:

. . . in part a translation of the second edition of Kohle (*Allgemeine Kohlengeologie*) by Otto Stutzer and in part a translation of a revision and abbreviation of certain chapters of that edition by Professor Stutzer. (p. v)

If the 1940 translation contained revisions of the 1923 edition, the question arises, how is it that a report published in 1927 bearing the name of Otto Stutzer could designate the skull as a fake, while his later book mentions it only as a "puzzling human skull"? We are led to wonder if the 1927 report could be spurious, but I have not discovered any reason to question the authenticity of this account.

In view of the fact that both author and chief translator died during preparation of the English

manuscript, it is plausible that there was a transfer of information from the German book of 1923 to its English edition of 1940 without benefit of the 1927 report.

Present Status of the Skull

Dr. Gilbert H. Cady, who worked mainly as an editor on the American edition of Stutzer's book, did not feel that he could be of any help regarding the book's reference to a "puzzling human skull." However, in order to help me obtain further information about the skull he suggested that I write Professor G. Roselt at the Freiberg Mining Academy. (Note: His address is Prof. Dr. G. Roselt, Abteilung Kohlengeologie des Instituts für Geologie der Bergakademie 92, Freiberg, Saxon, D.D.R. (East Germany).) Professor Roselt, who is a coal geologist and biologist, informed me by personal letter that this skull was one of the first pieces to become part of the coal collection at their mining academy. He says that it still is in the collection.

Professor Roselt and an associate, Professor Bach from the Institute for Anthropology at Jena (Note: His address is Prof. Dr. Herbert Bach, Institut für Anthropologie und Völkerkunde, Friedrich-Schiller-Universität, 69 Jena, Kollegienstrasse 10 D.D.R.), both have observed the skull and have indicated in personal letters (early 1968) that, according to their studies so far, the skull is not a fossil but rather a falsification.

In a letter written to me in the spring of 1968, Professor W. W. Howells, referred to previously, indicated that he had no further information than that which he sent in a 1959 letter. In the letter he said that Dr. G. Smolla points out that since the head was made before 1842 (which was before human evolution became a popular issue), it hardly could be a counterfeit human skull. Dr. Smolla feels that it simply is an artistic effort, likely of the Rococo Period.

How old is the coal contained within the skull? Depending upon its source, according to most authorities,^{4,7,8,9} this brown coal would have been formed some time during Eocene to Miocene, or 60,000,000 to 20,000,000 years ago. Brown coal is thought to be considerably younger than anthracite (hard coal) and bituminous coal (soft coal). Brown coal appears to be somewhat intermediate between soft coal and peat.

At the present time the earliest of human fossils is *Homo habilis* from Bed I in Olduvai Gorge with a suggested antiquity of less than 2,000,000 years.^{10,11} Some have felt that *Ramapithecus* (*Kenyapithecus*) should be classified as hominid and that the hominids were distinct 14,000,000 years ago.^{12,13} The above dates may be open to doubt, but at any rate, it does not appear that

*Kersten actually said, "a brown coal mine or similar place."

authenticated human fossils have been found yet in material having the suggested antiquity of coal.

Editor's Note: Time estimates given above are based on acceptance of radioisotope dating, and usual geological time scales. For a discussion of reasons many members of the Creation Research Society question these suggested dates see the September, 1968, *Quarterly* "Radiocarbon Dating," "Radiological Dating and Some Applications," and "Radiocarbon Confirms Biblical Creation."

Acknowledgements

During the course of this study Mr. Wolfram G. Graber gave considerable aid with many details involving Germany, especially in the matter of understanding nuances of the German literature. Valuable help also was given by Mr. James O. Buswell, III, Mr. M. R. Geer, Dr. George R. Homer, Dr. Ashley Montagu, Dr. Edwin A. Olson, Dr. Everett A. Sondreal, Miss Linda Wanaselja and Dr. Park O. Yingst.

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SQUARE PEGS IN ROUND HOLES OR RIDICULOUS "CONVERGENCES"

EVAN V. SHUTE*

An extensive presentation is made of a remarkable series of identical biochemical entities which are found in organisms widely separated taxonomically. Enough data are provided to illustrate that one can propose the most unlikely relationships based upon biochemical information, when employing the idea that resemblance means relationship—the assumption upon which the theory of evolution is based. What do biochemical affinities really mean—relationship by descent from a common ancestor, parallel variation, or are they examples of God's quotation of His previous work?

If such biochemical entities as the serological blood groups are good criteria in evolutionary phylogenies—and in this day of molecular biology we are beginning to pay more attention to biochemistry than to anatomy in taxonomic studies—I am equally interested in other biochemical species and genus markers. What do they say? Do they thunder as faintly as the blood groups about our "prehuman" parents? Or is their language unequivocal and congruent with blood group findings? If not, which shall we believe—or shall we discard evolutionary taxonomy on the molecular level?

Fundamentally the theory of evolution is based on the idea that resemblance means relationship. This is as true among the insects as the primates, but means more to us in the latter connection because the concept bears directly upon the origins of mankind. We may accept this axiom or not—but we can scarcely have it both ways at once. The evolutionist is uncomfortable

here—or was till he invented the term "convergence." Now he has an "out" wherever resemblances bear down embarrassingly hard on his theory. Still there are too many biological facts, if he looks closely enough, which do not fit into the phylogenies he has carefully drawn up against an evolutionary backdrop.

Let us see what enzymes and tissue fluids add to the picture.

Glands Producing Defensive Secretions

Glands of this type are so variable in every way as to demonstrate that they have arisen independently in the course of "evolution."¹ Should we insist that they are vital to phylogeny?

Arthropods of very diverse types may produce similar components in their defensive secretions. Thus the spray trans-2-hexenal occurs in Hemiptera, cockroaches, a myrmecine ant and many plants. Formic acid is secreted by ants, carabid beetles and notodontid caterpillars. The p-benzoquinones are found in beetles, earwigs, millipedes, a cockroach and a phalangid spider.

On the other hand, the defensive glands in the

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carabid beetles produce compounds as different as m-cresol, p-benzoquinones, salicylaldehyde, formic, tiglic and methacrylic acids. Among millipedes the orders Julida, Spirobolida and Spirostreptida secrete p-benzoquinones; the *Polydesmida*, cyanogenic agents; and a species of *Chor-desmida* produces a phenol. The saliva of the reduvid bug *Platymeris radamantus* resembles snake venom, both in number of proteins and in enzyme activity.

What is more surprising is that agents like 2-hexenal and alpha-pinene found in insects and termites respectively are very widespread in plants. Moreover, in cyanogenic plants, hydrogen cyanide is generated by hydrolysis of cyanohydrin glycosides. How amazing then that the polydesmid millipede, *Apheloria*, also generates hydrogen cyanide by the dissociation of mandelonitrile, the cyanohydrin of benzaldehyde! Citronella was first derived from plants, but now is known to be produced in the glands of an ant, *Acanthomyops*. Surely you are now convinced! Likeness means relationship!

Examples of Biochemical Identity in Organisms Widely Separated Taxonomically

The A enzyme of the deer mouse and the erythrocyte (red blood cell) enzyme of man are homologous.² Also the B enzyme of the deer mouse, *Peromyscus*, is homologous with another form of glucose-6-phosphate-dehydrogenase found in human tissues. Both types of glucose-6-phosphate-dehydrogenase are also found in horse liver! Are these enzymes residual chemical identities indicating the common origin of the deer mouse, horses and human beings? If so are they present in other "related" species, genera, and families? Let us have a look at some other strange identities in various organisms.

The phosphagen in the muscles of invertebrates is a compound of arginine, but the phosphagen in vertebrate muscles includes a compound of creatin. However, Echinoderm (starfish) serum contains creatin! Are starfish our cousins, Burton³ asks?

Various species of Western American semi-aquatic salamanders or newts of the genus *Taricha* contain in their eggs, embryos and adults a highly toxic poison, tarichatoxin, identical with that of the Japanese *Fugu* or puffer fish—no other occurrence is known in all nature!⁴ Here is an obvious relationship, surely!

The enzymes e-gulonolactone oxidase and d-glucurono-reductase are not found in primates, guinea-pigs, one fruit-eating bird (red-vented bulbul) and the Indian fruit-eating bat. These enzymes enable other animals to make ascorbic acid out of glucose. Hence these four types of animals can get scurvy due to a genetic limitation.⁵

Sperm whales have an insulin identical with that of pigs and still quite different from that of sei-whales. Yet pigs and whales are from different orders and cohorts.⁶

* * *

All marine fishes but the wrasse fishes (the cunner and tautog) possess rhodopsin as the characteristic visual pigment.⁷ All freshwater fishes have porphyropsin, another pigment. The sea lamprey, a vertebrate, has porphyropsin as an adult—all other vertebrates seem to have rhodopsin. The common New England spotted newt has porphyropsin exclusively, unlike frogs, but tadpoles have porphyropsin and only change later to rhodopsin. However, the frogs *Rana esculenta* and *R. temporaria* and the toad *Bufo boreas halophilus* do not change visual pigment at anatomical metamorphosis, continuing to have porphyropsin as the visual pigment. The mud-puppy, *Necturus maculosus*, has only porphyropsin, like the freshwater fish, and like the clawed toad *Xenopus laevis*.

The chick also reverses the "evolutionary sequence" in its urea metabolism. It used to be said by evolutionists to excrete ammonia like a fish, later urea like the amphibia, finally uric acid like adult birds. But recent work shows that its ammonia remains constant throughout and is never excreted. Urea is excreted from the fifth day on, but the chick embryo is never able to synthesize it. Its metabolism differs from the usual biochemical metamorphosis, therefore.

Wald cites other changes in development from the embryo to the adult in frogs and chicks, but is not sure if these are true metamorphoses, or if they are too continuous and begin too early in development to be ascribed to that.

* * *

Once the female sex hormone, oestrone, was believed to be produced by animals only. Now it is known in pussy willows, various palms such as the date palm and the pomegranate. Progesterones are found in an African shrub and perhaps in the jimmy weed.⁸

Histamine has been isolated from the venom of the red bull ant, relating it to that of the honey bee. But the venom of the common wasp (*V. vulgaris*), supposedly a closer "relative," contains both histamine and serotonin.

Dolichodial or dialdehyde, is found in ants and the structurally identical anisomorphalin phasmids—widely separated insect groups.⁹

The electrophoretic mobility of liver preparations of the enzyme galactose dehydrogenase from 11 mammalian species have been studied.¹⁰ The major bands of human and dog livers were indistinguishable—much closer than the bands of man and monkey. How are we to weigh such evidence?

* * *

The luciferins and luciferases have been held specific for a given type of invertebrate or fungus, cross reactions being very rare—and then only between such closely related forms as two genera of ostracods or two families of fireflies. But there are profound differences in various emission spectra, and there is an utterly random occurrence of bioluminescence in protozoa, fishes, bacteria and fungi.

Now Johnson *et al.*¹¹ have found a reciprocal cross reaction between these systems in the fish, *Parapriacanthus*, and a second fish, *Apogon*, from a different family. For further confusion, the latter fish has some cross reaction with the crustacean *Cypridina*, from a totally different phylum!

This could be a convergence, but “more likely represents some biochemical unity”!

Bone in the “lower” forms is probably not needed, but the characteristic bone salt, hydroxyapatite, is found in some unicellular flagellates where it seems to be correlated with muscular work!

All this is very puzzling to the evolutionist. Is it the “unity of biochemistry” and an “assumed evolution by implication?”¹²

* * * * *

Numerous reactions of the ornithine cycle in mammalian liver are seen in the biosynthesis of arginine and its degradation to urea in many microorganisms. Enzymes able to synthesize carbamyl phosphate are found in many bacteria and fungi and in the livers of ureotelic animals, but the carbamyl phosphate synthetase of the latter is unique and characteristic of ureotelism. The bacteria use carbamate kinase instead.

Choline esters are found in marine gastropod and some Crustacea and Insecta. For example, seneciylcholine is found in the common garden tiger moth, *Arctia caja*, acetylcholine in *Homarus americanus*, a crustacean and urocanylcholine in many gastropod or snails of the family Muriidae.¹³

Bile salts differ in different species. The coelocanth has bile salts of the alcohol-sulphate type—no other animal has these. Only sharks (selachii) possess scymnol. It is found nowhere else in nature. Teleostii have C₂₄ bile acids such as cholic acid, conjugated with taurine. Such bile acids are found in snakes, birds and mammals—but can't prove a close relationship, surely! Marine teleosts do not contain cyprimol. The latter is seen in all fish of the family Cyprinidae and in some frogs (Ranidae). Cetacea (whales) share bile salts with the modern Eutheria. Seals and walruses share C₂₃ hydroxylated bile acids only with snakes—much different from those of the Cetacea.¹⁴

Amino acid sequences should be a powerful tool in the classification of beasts. But the artio-

dactyls are puzzling. Sheep and goats have identical peptide sequences, but these are closer to the fibrinopeptides of the reindeer than of the ox! This is exactly the opposite of what the usual taxonomy would indicate. Indeed, the pig and ox are identical in some respects in their sequences.¹⁵

Species specificity for growth hormones was established in 1954, and varies from a molecular weight of 21500 for the human being to 47800 for the sheep. The monkey weight is 23000. The whale and pig are very close at 40000, and the ox and sheep also are close at about 45000.¹⁶

As regards cytochrome-c, the penguin is closely associated with the chicken, which is identical to the turkey. The kangaroo is closely associated with non-primate mammals, although its relationship to placental should be distant! The turtle is closer to birds than to the rattlesnake. The cytochrome-c of cow and sheep are identical with that of the pig.¹⁷

Williams¹⁸ also mentions that the differences in the cytochromes of *Neurospora* and yeast are very large—yet these are in the same class of fungi! How shall we work these data into our phylogenies?

The distribution of acid and alkaline phosphatase in the elephant placenta is identical to that in the cat and dog, say Cooper *et al.*¹⁹

Comments

The dubious values of chemical paleogenetics are illustrated by Zuckerkandl.²⁰ Enough has been provided above to illustrate that one can propose the most unlikely relationships in all nature by biochemical data. Convergence again? Perhaps! Who can say? Who can even say whether convergence exists, or if God merely quotes Himself sometimes. Why should He not do so? Note the following points, in summary:

1. In nature we find defensive substances produced by widely different families of insects and even shared by plants.

2. An enzyme of our blood is also found in the deer mouse and the horse liver.

3. A highly specific, complex toxin is found **only** in Western American semi-aquatic salamanders and the Japanese puffer fish.

4. The inability to make ascorbic acid out of glucose is common to primates and the fruit eating bird called the red-vented bulbul, as well as the guinea-pig and Indian fruit eating bat.

5. Sperm whales share an insulin with pigs, but not with other kinds of whales.

6. Human and dog livers are almost identical in galactose dehydrogenase.

7. The bone salt, hydroxyapatite, is shared by one-celled flagellates and vertebrates.

8. Choline esters are shared by snails and tiger moths.

9. Certain complex bile acids are found only in seals, walruses and snakes.

10. Nearly identical amino-acid sequences are found in the pig and the ox.

11. Growth hormones of the whale and pig are very similar.

12. Phosphates of the elephant placenta are identical to those of the dog and cat.

All this information makes one think nature is laughing at us and having high jinks with enzymes and secretions without caring what harm she does to our most carefully drawn up taxonomic structures. What do biochemical affinities really mean—relationship by descent from a common ancestor, parallel variation, or are they examples of God's quotation of His previous work?

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A SIMPLIFIED EXPLANATION OF THE FIRST AND SECOND LAWS OF THERMODYNAMICS: THEIR RELATIONSHIP TO SCRIPTURE AND THE THEORY OF EVOLUTION

EMMETT L. WILLIAMS, JR. *

Evolution simply could not have occurred unless both the first and second laws of thermodynamics were violated many times. After explaining thermodynamics in non-mathematical language, relation of the first law to evolution, and relation of the second law to evolution, is given extensive consideration. Three arguments, which are often offered to "defend" the occurrence of evolution in spite of thermodynamics, are studied carefully. It is concluded that the first and second laws of thermodynamics overrule evolution.

Introduction

Many Christians have heard that there are scientific laws derived from the field of thermodynamics, and that these laws are opposed to the theory of evolution. However, many of these Christians do not know exactly what is included in the science of thermodynamics. The purpose of this article is to give a simplified, non-mathematical explanation of the first two laws of thermodynamics, so that Christians may be better equipped to use their knowledge against the tenets of evolution.

In preparing this article, no apology is made for relying heavily on Henry M. Morris' excellent

book, *The Twilight of Evolution*.¹ Morris has ably shown that the first two laws of thermodynamics are opposed to the theory of evolution. His book contributes much to an understanding of the subject, but it was not his primary intent to develop the methodology of thermodynamics --which will be undertaken here.

What is Thermodynamics?

First, consider the word *thermodynamics*. *Thermo-* is a combining form from the Greek word *therme-* (heat). *Dynamic* comes from the Greek word *dynamis* (power). Thus, thermodynamics is the study of heat power. The subject of thermodynamics arose historically from the study of heat engines, and the problems involved in converting heat into mechanical work.² One may legitimately ask how the study of heat

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movement can be related to a biological subject, evolution? This question must and can be answered.

But an even more basic question must be answered first: what is heat? Heat is a form of energy, but more importantly, it is a form of energy in transition—heat flow.³ The idea of movement is very important, since heat can be detected only if it moves from its source. Therefore, heat is the name for energy as it is transferred from one region to another by the thermal processes of conduction, convection, and radiation.⁴

There are other forms of energy besides heat, such as mechanical, electrical, and magnetic energy. These forms of energy are related.

Energy can be transformed by various means. Heat may be transformed into mechanical work, or into electrical energy, and vice versa. James Joule (1818-1889) was the first scientist to show quantitatively the mechanical equivalence of heat. The relation he established may be written mathematically as follows:

$$W = JQ \quad (1)$$

where W = mechanical work dissipated, Q = quantity of heat produced (by mechanical work), and J = proportionality constant.

The study of thermodynamics is actually broader. It involves the movement of energy, and the conversion of one form of energy into another, and particularly involves relations between heat and work.⁵ Thus thermodynamics can serve as a field of unification for all of the exact sciences,⁶ since energy is required for all natural processes.

Another question of importance is related to this discussion: what is energy? Energy is the ability to do work. Lord Kelvin gave a more sophisticated definition:

The energy of a material system is the sum, expressed in mechanical units of work, of all the effects which are produced outside the system when the system is made to pass in any manner from the state in which it happens to be to a certain arbitrarily fixed initial (standard) state.⁷

In the first definition, a system that is more energetic can do more work than another. In the second definition, there is no such quantity as absolute energy, but only relative energy; only energy differences can be measured. (See Darken and Gurry, p. 140)

Relation of Thermodynamics to Evolution

Back to the original question: how can thermodynamics be related to evolution? Consider the definition of evolution given by Sir Julian Huxley, the British biologist:

Evolution in the extended sense can be defined as a directional and essentially irreversible process occurring in time, which in its

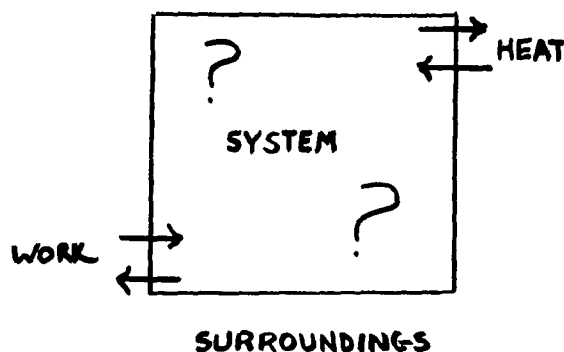


Figure 1. Diagram representing work and heat passing through a system boundary.

course gives rise to an increase of variety and an increasingly high level of organization in its products. Our present knowledge indeed forces us to the view that the whole of reality is evolution—a single process of self-transformation.⁸

Obviously evolution involves transformation, and natural transformations require energy. Such a description of evolution as given above would require tremendous quantities of energy and many energy transformations. The process of evolution requires energy in various forms, and thermodynamics is the study of energy movement and transformation. The two fields are clearly related. Scientific laws that govern thermodynamics must also govern evolution.

Thermodynamic Systems

Methods of thermodynamics may be applied to a particular system under investigation. A moving automobile, a working person, a pot of water, a beaker of acid, a piece of metal, or a cylinder of gas may be treated as a thermodynamic system. All chemical reactions, physical processes, and natural operations may be treated as systems under study.

A system is some part of the physical universe "isolated" from its immediate environment so that it can be studied. An imaginary boundary is placed around the system to separate it from its surroundings. For practical purposes, the rest of the universe may be ignored, as being independent of local happenings in the system and its immediate surroundings.⁹ (See Figure 1)

The system is a reservoir of energy no matter what it is, or how complicated it is. A moving automobile, a piece of hot or cold metal, a pot of frozen or boiling water, a reacting mixture of chemicals, or a college sophomore may all be considered as reservoirs of energy from the standpoint of thermodynamics. This generality is what makes the application of thermodynamic principles universal. The application of other scientific methods may cause the investigator to become lost in endless details of atomic struc-

ture and mechanistic rationalizations, in which logical difficulties appear, leaving the theory incomplete.

Many unnecessary scientific details may be avoided in investigating thermodynamic systems, when thought of as reservoirs of energy. A scientist need only measure a few easily determined properties (or variables) of a system to determine its relative energy content. Such properties as temperature, pressure, volume, and composition often provide all the information needed to completely define a thermodynamic system. This approach is very simple. Interactions between the system and its immediate surroundings can be followed easily. These interactions include various energy exchanges. (See Crawford, p. 3)

First Law of Thermodynamics

Robert Mayer (1814-1878) was the first scientist to suggest the general principle of energy conservation. Mass and energy can be transformed one to another, but the total energy content of the universe remains the same. There is no destruction or creation of matter or energy now going on in the physical universe. This was considered a bold and speculative idea in 1842.¹⁰ Basically the conservation of energy principle is the first law of thermodynamics. In Mayer's own words, this law is stated:

I therefore hope that I may reckon on the reader's assent when I lay down as an axiomatic truth that, just as in the case of matter, so also in the case of force (the then current term for energy), only a transformation but never a creation takes place.¹¹ (Parentheses added)

Such an idea may have been considered quite bold, but the Bible contains many statements of this principle. The Holy Spirit does not call attention to them as the first law of thermodynamics, or as the principle of energy conservation, but many statements can be interpreted as such:

Thus the heavens and the earth were *finished* and all of the host of them. And on the seventh day God *ended* his work which he *had made*. (Genesis 2:1-2)

But the heavens and earth which are now, . . . are *kept in store*. (II Peter 3:7)

Other verses which indicate that creation is finished and conservation processes are now in operation are Exodus 20:11; Exodus 31:17; Psalm 33:6,9; Nehemiah 9:6 (preserving the creation mentioned here); and Hebrews 4:3,10. Hebrews 1:3 speaks of the Lord Jesus Christ as *upholding* all things, showing His continued maintenance or preservation of the universe.

That the first law has universal application is clear from the assertion of Scripture. There are no known exceptions to this law within the limits of experimental error.

It should be obvious to anyone, who believes in creation by direct acts of God, that only He can create something out of nothing. Man is incapable of such creation. Once God stopped creating, conservation processes began. (One other consideration, degeneration, will be covered later.) Man can only utilize what has been created; he can transform various created quantities, but never create something without using existing material.

If the energy of the universe is conserved, it now becomes the scientist's job to keep up with the energy moving in and out of a system. He can do this very simply because energy transfers usually can be placed into two categories: heat and work.

Equation for First Law

A system can receive or reject heat depending upon the temperature of the immediate surroundings. Temperature is an arbitrary measure of the thermal energy of a system. If the surroundings are hotter (higher temperature) than the system, thermal energy will flow into the system, and if the surroundings are colder (lower temperature) than the system, thermal energy will flow out of the system.

Secondly, a system can do work or have work done on it. For instance, an enclosed gas system can expand (it does work on its immediate surroundings), or be compressed (surroundings do work on the gas). The work done on or by the system can be mechanical, electrical, magnetic, etc.

A simple mathematical statement of the first law to account for all of these changes for a given system is:

$$dE = dQ + dW \quad (2)$$

where d is a mathematical term which can be interpreted as "the change in" or "difference in"; E represents the energy of a system, normally expressed as internal energy; Q = heat content of system; and W = work done on or by system.

In this equation the change in internal energy of a system (dE) is equal to the change in heat content of a system (dQ) plus the work done on or by the system (dW). If the system gains heat energy, dQ is positive; if it loses heat, dQ is negative. For work done on the system, dW is positive, and for work done by the system on its surroundings, dW is negative. Only energy differences can be measured.

An interesting comment on internal energy is made by King:

No simple monosyllabic word exists as a name for the energy which we have represented by E . Perhaps the Anglo-Saxon word *sawl*, meaning the spirit or essence of a substance is suitable. Then *sawl*, like work and heat, is one form of energy during its transfer between a system and the near-surround.¹²

Hebrews 1:2 states that the Lord is “upholding all things *by the word of his power*.” How is the creation being conserved, or what is the source of this energy? Morris,¹³ on the authority of this verse, states that it is the Creator Himself.

The First Law and Evolution

The Bible and the first law of thermodynamics indicate that creation is finished.^{14,15} Only processes of conservation, preservation, and maintenance are scientifically possible.

Refer again to Huxley's definition of evolution. Evolution is irreversible in time and still continuing. Evolution gives rise to new products. In other words, creation processes are supposed to be still in progress. Obviously the Bible, the first law of thermodynamics, and evolution cannot all be true. If the Bible and the first law are correct, then evolution is false, or vice versa.

It is to be hoped that the Scripture itself will convince a Christian that evolution could not be true. However, suppose we face a man who claims to believe both the Bible **and** evolution. Such position seems intellectually impossible without compromising one of the two extremes, and usually such persons do not believe the Biblical account of creation literally. Morris argues:

It is thus absolutely impossible to believe in the Bible as the complete and literal Word of God and to believe in the theory of evolution.¹⁶

The theistic evolutionist usually believes the theory of evolution **more** than he believes the Bible. If he will not heed Scriptural teaching, he still must face the first law.

What is the “best” science, the first law or evolution? The first law is primarily an empirical law. Equation 2, given above, was developed through experimentation. Granted, Mayer suggested the principle of energy conservation *a priori*, as far as modern science is concerned, and Helmholtz presented the precise mathematical formulation in 1847. Yet, the first law is backed solidly by experience and experimentation. Direct observation of the way matter behaves demonstrates that the first law is true.

What about the validity of the theory of evolution? The very use of the term “theory” should suggest that it is not scientific law. Is evolution backed by experience and experimentation? Is it directly observable? No! Neither Huxley, nor any other scientist can *prove* that the process which he defines has taken place or is taking place. The obvious conclusion is that the first **law** of thermodynamics is science, and the **theory** of evolution is not.

Someone may wish to side-step the direct confrontation of the first law of thermodynamics and the theory of evolution (again it is assumed that he refuses to accept Biblical instruction). Someone may reason that the first law simply says that

energy and matter are not being created or destroyed at this time. However, could not the existing energy and matter be used to develop new products, greater variety, and more organization? Suppose that new matter and energy are **not** being created; they are only being **used** in an evolutionary process.

To answer this hypothesis, we must understand the direction of natural processes. As natural processes occur, which way do they tend to go—toward evolutionary development, in an opposite direction, or in neither direction? The second law of thermodynamics gives the answer to this question.

Second Law of Thermodynamics

When men began work with heat engines in the last century, the second law of thermodynamics was formulated. Most modern industries obtain power from heat engines. For instance, coal or oil is burned to produce steam which produces electrical power which in turn is used by machines in industrial plants to produce mechanical work. Basically, heat energy is converted into mechanical work.

Heat transfer is of prime importance for such operations. The first thing that can be noted in heat transfer is that heat will flow only one way. Heat will flow only from a body of higher temperature to a body of lower temperature.

For example, if a hot iron ball is placed beside a cold iron ball, no heat energy will be transferred from the cold ball to the hot ball, resulting in a decrease of temperature of the cold ball while the hot ball increases in temperature. What happens is that the hot ball begins to lose heat energy, whereas the cold ball receives this heat energy until both balls come to the same temperature.

Why will heat not go from a cold body to a hot body? It is simply because of the character of the physical universe. This direction of heat flow has always been observed. This is the direction of a particular natural process (heat flow). One statement of the second law is that heat cannot pass spontaneously from a body of lower temperature to a body of higher temperature.¹⁷ (The conventional second law of thermodynamics was introduced by Clausius (1850) and Kelvin (1851), independently. Carnot (1824) actually discovered the essence of the second law before it was stated in this form.¹⁸)

Interestingly, all natural processes tend to go spontaneously **only** one way. King says:

This “onewayness” appears to be a very fundamental characteristic of natural processes. The second law of thermodynamics epitomizes our experiences with respect to the direction taken by thermophysical processes.¹⁹ In the definition of the second law, *spontane-*

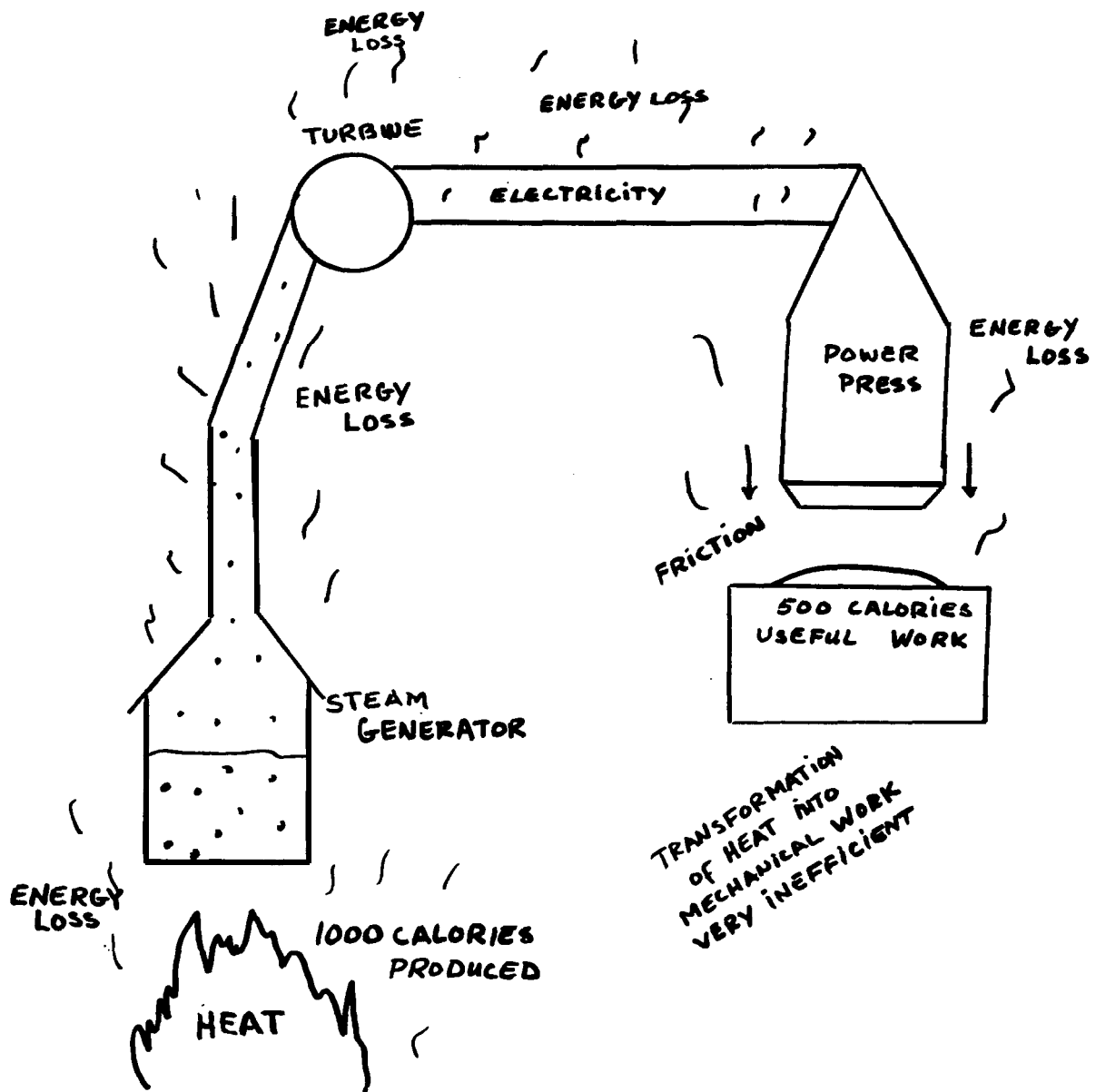


Figure 2. Illustration of degeneration of 1000 calories into only 500 calories of useful work.

ous refers to the process as unrestrained. In other words, the process is allowed to proceed naturally without any external restraints. Any natural process is a spontaneously occurring one.

Consider again heat transfer: the flow goes from a reservoir of high temperature to a reservoir of low temperature. As the heat energy moves from the hot reservoir to the cold reservoir, there is a heat loss to the surroundings. The process of heat transfer is not 100% efficient. The first law of thermodynamics has been obeyed. The energy that is lost to the surroundings is not destroyed; it simply becomes unavailable to do any useful work.

Suppose heat energy is being used to produce mechanical work. If 1000 calories of heat energy are generated at the source, after the energy conversion is accomplished, the final machine may be able to produce only 500 calories of mechanical work. (See Figure 2) Thus there is an unavoidable waste of heat.

Clausius in 1865 introduced the concept of *entropy* in connection with this heat waste.²⁰ High entropy heat would have considerable waste, whereas low entropy heat would have very little waste. Low entropy heat is more valuable than high entropy heat. In fact, the entropy

of the heat is more important than the amount of the heat.²¹

It is not only of interest to provide heat to produce mechanical work, but also the temperature at which the heat is produced becomes important in determining how much of the heat can be utilized later for mechanical work. Heat produced at one temperature will have a different entropy (usability) value than heat produced at another temperature.

Another Statement of Second Law

This inefficiency of thermal operations led to another statement of the second law. It is impossible to build an engine which would extract heat from a given source and transform it into mechanical energy without bringing about some additional changes in the systems taking part.²² This statement eliminates the possibility of any perpetual-motion engine.

Although this statement refers to thermal processes, it has been found through observation and experimentation that the second law applies to all natural processes. Natural processes are inefficient. There is a waste of energy in any natural process. All energy being utilized has an entropy value or has the property of entropy. As more and more energy is utilized, more energy is wasted, and the entropy of the universe increases.

Clausius summarized the two laws of thermodynamics by saying that the total energy of the universe is a constant, and the total entropy content of the universe increases.²³ This means that the energy wasted can never be utilized again. It becomes unavailable, but it has not been destroyed.

All natural processes occur in a direction such that there is an increase in entropy. The second law shows the direction of natural processes. Consider the example of the hot and cold iron balls. The hot one cools and the cold one heats up until they reach a common temperature. If this new temperature is greater or lower than the room in which the balls are located, then the temperature of the balls will change until it equals the room temperature. The balls gain or lose heat energy until they reach the temperature of their environment.

It is known from thermodynamics that all isolated systems proceed toward a state of equilibrium; i.e., a system changes its state toward one in which the physical properties of the system are as uniform throughout as possible under the prevailing conditions.²⁴ If the system is exposed to its surroundings, both the system and surroundings will approach a state of equilibrium with each other. If natural processes proceed so that entropy increases and proceed toward a

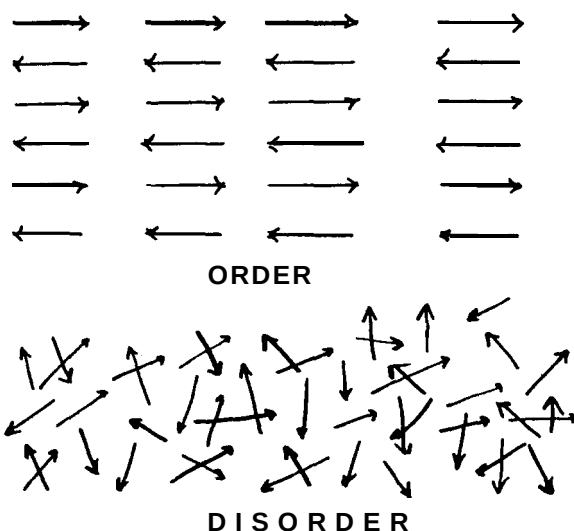


Figure 3. Illustration of order versus disorder.

state of equilibrium, the state of maximum entropy is the equilibrium state.

Natural Processes Occur Spontaneously

All natural processes occur spontaneously. It is possible to force some processes in a reverse direction; however, once the system is released from this force, it will proceed spontaneously in the natural direction toward equilibrium.

For instance, a beaker of alcohol and water will mix spontaneously. As long as the mixture stays in a beaker it will not tend to unmix spontaneously. By subjecting the mixture to thermal or chemical operations the two could be separated, but never will they separate by themselves. The mixture of alcohol and water is a disordered arrangement of alcohol and water molecules. The two separate beakers of alcohol and water are not as disordered as the mixture. Thus, natural processes tend toward a state of higher entropy (a state of higher disorder). (See Figure 3)

The equilibrium state of a system is the state of maximum disorder. Therefore entropy is associated with disorder. To explore fully the concept of entropy and disorder, statistical mechanics must be introduced and this is beyond the scope of this discussion. For a more complete discussion of entropy and disorder, see reference 25.

The principle of increasing entropy in thermodynamics is true of an isolated system. This principle is of extremely general application because all material, that is in any way affected by a process, may be included within a single isolated system.²⁶

Caratheodory established in 1909 a rigorous mathematical basis for the concept of entropy. Since he deduced the existence of entropy as a

solution function for a particular differential equation, he showed that entropy must be due to some very special character of the world in which we live.²⁷ The character of the world and universe can be found in Scripture.

The principle of increase of entropy or the increase in disorder is set forth in Scripture:

Of old hast thou laid the foundation of the earth; and the heavens are the work of thy hands. They shall perish, and thou shalt endure. Yea all of them *shall wax old* like a garment; as a vesture shalt thou change them, and they shall be changed. (Psalm 102:25-26)

All go into one place; all are of the dust and all turn to dust again. (Ecclesiastes 3:20)

See also Isaiah 51:6; Romans 8:20, 22; and I Peter 1:24.

The Bible sets forth a process of aging and "wearing out" of the heavens and earth. This growing old and "wearing out" is toward a state of increasing entropy. A state of maximum entropy in the universe would be one of uniform temperature. This could only be attained when all of the high energy sources have dissipated their energy.

As bodies, such as the sun, dissipate their energy, there is a tremendous waste of energy. The high energy (high temperature) bodies cannot receive energy from the lower energy (low temperature) bodies to replenish their supply, so they are wearing out (even though the process is very slow). The universe is "running down" from a standpoint of available energy for natural processes. If such a state of uniform temperature ever occurred, it would be a state of maximum disorder and maximum entropy.

All aging or wearing out processes are toward a state of maximum entropy. Consider an article of clothing. As it is worn, it fades and becomes threadbare. The original garment represents a state of low entropy compared to the final worn-out garment. Much energy was expended to take the cotton or wool from its original form until it was formed into a completed garment. As this energy was utilized, much energy waste occurred, increasing the entropy of the universe. The cotton or wool fibers did not spontaneously form a dress; they were mechanically formed and chemically treated and forced into the article of clothing.

As the garment deteriorates, it is increasing in entropy. No matter how the garment is cleaned and restored, it never can maintain its "newness." The cleaning and restoration processes are inefficient and no amount of energy output will keep the garment in its original state. Eventually the garment will reach a state of maximum entropy when it has degenerated into dust (a state of high disorder).

The same reasoning applies to the human body. Death causes the body to return to dust, or in other words, the body has now come into equilibrium with its surroundings. Ecclesiastes 3:20 has been satisfied; death is a manifestation of the second law of thermodynamics.²⁸

The Second Law and Evolution

The second law of thermodynamics is an empirical law, directly observable in nature and in experimentation. Yet, it has its basis in Scripture. This law implies that the direction of all natural processes is toward states of disorder. From the standpoint of statistics, natural operations proceed in a direction of greatest probability.²⁹ The most probable state for any natural system is one of disorder. All natural systems degenerate when left to themselves.

What about evolution and the second law? Huxley states that evolution is an irreversible process which leads to greater variety, to more complex, *higher degrees of organization*. His assertion contradicts the prediction of the direction of natural processes called for by the second law! Either evolution has occurred in spite of the second law, or evolution has not occurred at all.

There can be no question about the correctness and universality of the second law. How could evolution occur in spite of it? Many scientists would claim that most experiments conducted to verify this law are performed in closed systems. Biological systems are open systems (a system whose boundary is crossed by matter,³⁰ such as food intake and waste output), and it is theoretically possible for entropy to decrease in open systems.

Refuge Sought in Open Systems

Therefore, it is claimed that it is possible for evolution to occur in these open systems, since they may be immune to the effects of the second law. Such reasoning is not very convincing.

Most scientific theory and law has been developed in the way Kestin states:

In fact, in any branch of physics, the analysis of a phenomenon or process in terms of the relevant physical laws must begin by mentally isolating a collection of bodies from the rest.³¹

Normally, laboratory experiments are closed systems. The results obtained from such experiments usually are accepted by scientists without so much "fuss" about closed systems.

It would be possible to consider our solar system a closed system and observe the effects in this closed system. An analysis designed to obtain quantitative data is scientifically impossible; however, from general observations there is much qualitative data available. There is certainly a trend toward death, decay, and disorder, and no observable trend toward evolutionary develop-

ment. There is obviously change and adaptation, but no evolution as called for by Huxley.

Open biological systems are subject to the second law. The entropy content of open systems may not increase as rapidly as that of closed systems, but it does increase as evidenced by *decay and death*.

What about local decreases in entropy even though the entropy of the universe increases? Supposing millions and billions of years of local decreases in entropy, there would be countless exceptions to the second law in evolutionary development. Thus, some evolutionists reason that the second law would be overthrown so many times that it could not be considered law. Therefore, evolutionary development does not call for an occasional violation of the second law but for continual violations.

From the above pattern of ideas, one might deduce that the second law is really not scientific law; however, such a statement is preposterous! None of these violations is observed today, and it can only be postulated that they occurred in the past. The burden of proof rests on the man who makes such claims, and no satisfactory evidence can be given to support such an hypothesis. On the other hand the Christian can say that evolution has not occurred, because such a process is neither Scriptural, nor scientific.

Another Argument: System Coupling

Another argument often presented and similar to the open system objection is that a system can be coupled to another. One system decreases in entropy while the system coupled to it increases greatly in entropy and the total for both systems is an entropy increase. Thus one system has decreased in entropy, but the second law has been obeyed.

An example of such a coupling may be observed when a person pulls a metal weight into the air by means of a pulley. The metal weight cannot spontaneously lift itself, but a person might lift it with a pulley, decreasing the entropy of the block. The energy waste in such an operation would cause a total entropy increase. To maintain the weight at this low entropy position, the person must continually pull the rope.

Eventually the person will get tired. Even if he is fed, he will finally weaken so that he must release the rope. (See Figure 4) The weight returns to the high entropy position. A constant restraint such as the one illustrated could cause a local entropy decrease. However, the coupling or restraint must be continually maintained. If the system is left alone or the force on it relaxed, the system will return to its most probable state.

Are there any such couplings or restraints now operating to "aid" the process of evolution? If

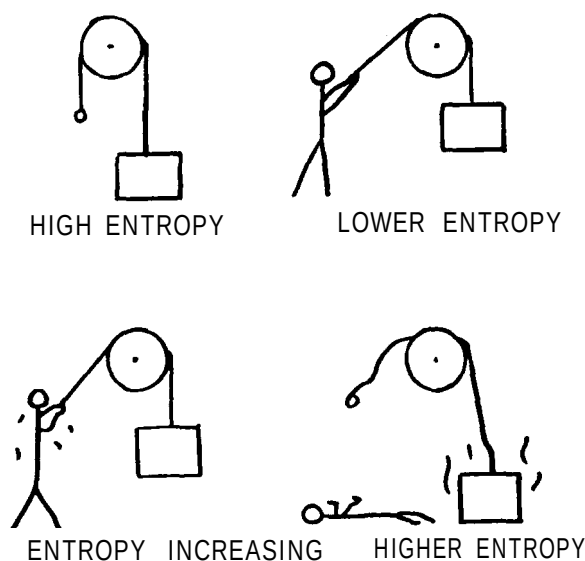


Figure 4. Cartoon to illustrate that coupling is not effective to lower entropy of a system.

they operated in the past, they must be operating now to hold the systems in a lower entropy state. Evolution requires natural causation and random changes. Such couplings or restraints must be beyond random processes because they must operate continually, and the process becomes controlled.

The couplings and restraints observed on biological systems do not cause any evolutionary development as stated by Huxley. Changes that do occur in biological systems are in most cases harmful.³² No evolutionary development can be perceived. No satisfactory evidence can be presented to show that such coupling or restraining forces have forced any type of evolutionary process counter to the second law of thermodynamics. Again the burden of proof rests on those who claim it could have. To prove such a statement is an entirely different matter. Even as an organism grows, it is wearing out and will eventually die.³³

Final Objection: Theistic Evolution

The final objection comes from those who claim that God has directed the process of evolution (theistic evolution). The reasoning may go something like this: God chose the process of evolution to create (?) the universe and bring everything into being. At crucial points in the evolutionary development God intervened to cause continuation of the process. Then evolution could occur in opposition to the second law.

Henson³⁴ states that the term theistic evolution is antithetical. The process of evolution needs no creator or director. It is completely materialistic. Consider another comment of Huxley's:

Darwinism removed the whole idea of God

as the creator of organisms from the sphere of rational discussion. Darwin pointed out that no supernatural designer was needed; since natural selection could account for any known form of life, there was no room for a supernatural agency in its evolution. . . . There was no sudden moment during evolutionary history when "spirit" was instilled into life any more than there was a single moment when it was instilled into you. . . . I think we can dismiss entirely all idea of a supernatural overriding mind being responsible for the evolutionary process.³⁵

The view of theistic evolution normally is held by Christians who want to put God into a completely atheistic system. By moving to this point of compromise they feel they are able to profess to believe in a creator or initiator, and also to agree with modern evolutionary thinking. Actually such a position does not satisfy a true creationist or a true evolutionist. The creation account in the Bible does not allow for such reasoning; and, when a person takes the position of theistic evolution, the Scripture must be warped completely away from its true meaning or simply ignored as a factual account.

If He had wanted to do so, God could have used a process of evolution to create and fashion the physical universe and all life in it. However, if He did, why did He not say this in His Word? The Genesis account of creation is a series of quickly-consummated acts, not of processes of millions and billions of years of slow transformation. The process of evolution limits God. It is cruel and involves trial and error.³⁶ Did God need natural selection (trial and error) to design? If God knows the end from the beginning, why should He use such a process? Evolution does not fit the character of God as revealed in the Bible.

Evolution is completely unscriptural. I do not see how anyone can comfortably claim to be a born-again Christian and be an evolutionist. To believe in evolution requires that eventually much of the Bible must be explained away. For instance, the Bible says that death came into the creation when Adam sinned. To be an evolutionist, one must admit that death had occurred millions of times before Adam. The position of theistic evolution is not Biblically or scientifically tenable. It seems strange that someone would invoke God's direction in an atheistic process to overcome a scientific objection such as the second law.

It is impossible to cover all the objections that have been given by those attempting to refute the position that the second law of thermodynamics opposes the theory of evolution. Open systems, steady states, coupled systems, occas-

ional violations, and directed evolution could all be claimed as means of avoiding the consequences of the second law. Yet none of these could ever be shown to be true, and they will be mere fancy or imaginative guesswork.

Men are going to believe what pleases them. Neither evolution nor creation can ever be proven scientifically. But the Christian is in a better position, for he has God's written relegation of what happened and scientific law for his case; however, the evolutionist has only hypothesis derived from logical thought processes. Evolutionists can fit experimental data and natural observations into an evolutionary framework, but the same material can be fitted into a creation and universal flood framework. Men must choose the system which they wish to believe.

Origin of the Second Law

Morris³⁷ suggests that the second law of thermodynamics originated when God cursed the creation because of Adam's sin. At that point death entered the physical universe. Disorder and decay processes began in all natural operations (Romans 8:20, 22).

Uniformitarian scientists would object to this. They claim scientific processes now operating have always been in existence. Evolution would have to occur with both the first and second laws of thermodynamics in operation. This is not possible. If an evolutionist accepts this framework (death only after Adam sinned), then the survival of the fittest and other evolutionary arguments are needless.

Millions and billions of years of evolutionary change, with no death, would be unthinkable in considering over-population of all species! Evolution cannot be comfortable with or without the second law! It needs the second law (death) to explain the driving force for evolution (survival of the fittest), but the second law operates against evolutionary processes,

Conclusions

It seems more reasonable to believe that the existing order and complexity in the physical universe was created into it by God. Present scientific processes simply maintain that order and complexity. No new variety or more complex structure is coming into being. Only existing organisms are being modified. This view is consistent with the first law of thermodynamics.

The universal trend toward disorder and decay was invoked when God cursed the creation because of Adam's sin. The present complexity and order of the universe is decreasing. The rate of this degeneration is not a problem for thermodynamics. Rate processes are the concern of the field of kinetics. In the relatively new science of nonequilibrium thermodynamics, the rate of

entropy production is a variable, but entropy always increases at a perceivable rate.^{38,39}

The second law of thermodynamics is a scientific statement of the Scriptural principle of disorder and death. This law is diametrically opposed to the theory of evolution. Many scientists, besides those in the Creation Research Society, are beginning to realize that there is something seriously wrong with the theory of evolution, and some of their work has appeared in print.^{40,41} However, whether the majority of men will accept creation or not is another matter.

Scientific laws overrule the process of evolution. The two laws discussed in this paper call for conservative and degenerative processes operating together. Evolution is not a conservative or degenerative process. Therefore it is concluded that evolution could not have occurred, since the first and second laws of thermodynamics would prevent any process that consistently produces greater order and complexity in the physical universe.

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- ¹⁶*Ibid*, p. 33.
- ¹⁷Kestin, *Op. cit.*, p. 410.
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(Continued from Page 132)

cal studies in the region. It seems that the real significance of this coal skull is still an open question.

As a matter of interest, though admittedly without documentation, a coal miner in West Virginia, obviously both competent and honest, told me recently that his party had excavated in a mine some years previously a perfectly formed coal-ized human leg. He said a government man had come and taken it off and he had no idea where it was now.

Another man has prepared a statement that deep in another coal mine, his father's party had unearthed, many years ago, a well-constructed concrete building, the news of which was quickly suppressed. Whether there is solid truth to such reports or not, there do seem to be many such rumors.

In any case we have ample other justification, both Biblical and scientific, for continuing to reject evolutionary geology and its chronological framework.

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IMMORALITY IN NATURAL SELECTION

WILLIAM J. TINKLE*

Differences of opinion become evident when it is claimed that living things reached their present structure by natural selection. That improved kinds are formed by struggle through natural selection is not supported by modern findings. Influence of the doctrine of natural selection has been illustrated by behavior of industrialists and militarists, who have reasoned that, if evolution was accomplished by selfish initiative at the expense of other living things, it is easy to justify the same conduct now. It is dangerous to believe that man is the product of struggle among selfish, irresponsible lower organisms.

Many church people consider natural selection merely as an academic principle. Since they are not trained in science, they are content to let such matters be decided by the scientists. Such an attitude, however, entails drifting with majority opinion, which never should be done in an important matter. The results of such doctrines as natural selection affect society in general.

The term *selection* is used in agriculture in a somewhat restricted and technical sense. A good farmer does not plant just any seed from his crop, but chooses seed from the plants which please him most. He does not keep animals indiscriminately to become parents of the next generation, but chooses those which have the best characteristics. If the next generation of plants or animals is better, because of such restricted parentage, we say that the selection was effective; but, if the progeny are no different from those of unrestricted breeding, the selection is ineffective.

This choice of parents by man is called artificial selection. If the forces of nature accomplish a similar result we call it natural selection.

For instance, if a mixture of corn, *Zea mays*, is planted in central Canada, only a part of the crop will produce viable seed, the rest being killed by the early cold weather of autumn. It is as if nature had selected the early-ripening plants to become the parents of the next generation. If viable corn seed is planted in the same Canadian climate for several seasons, an early maturing strain will be sorted out.

Albino seedlings (plants without green coloring) sometimes come up in a corn field, and of course soon die. Animals born in a crippled condition soon die if they are wild animals, and thus do not reproduce their type. In this way natural selection maintains a standard, a type of lower limit, in the kinds of plants and animals.

Differences of Opinion

To this extent the effectiveness of natural selection is recognized by all observant persons. But differences of opinion become evident when it is

claimed that living things reached their present structure by natural selection. Evolutionists insist that natural selection not only maintains a lower limit and sorts out types for new habitats, but also improves the kinds, making plants and animals which are larger and better organized than anything which preceded them. Thus new and improved families, orders, and phyla are said to have been formed.

It was this doctrine which convinced a large portion of scientists that evolution is correct. Ever since ancient times, a few writers claimed that living things arose from very simple beginnings, but these writers were not believed. Then Charles Darwin presented his theory of natural selection in great detail and "sold" the idea of evolution.

Furthermore, the doctrine of natural selection is still depended upon as the basis of evolution. "*Homo sapiens*, like all other organisms, has evolved from prior, extremely different species, by natural means and under the directive influence of natural selection."

A thoughtful person can readily see that the theory of evolution by natural selection encourages selfish aggression and violence. It not only condones selfishness; it is founded upon it. The animal which asserts itself and overcomes its fellows is supposed to do so because it has superior genes. It therefore leaves more descendants than the average; and, thus, in time a superior strain is built up, and later, an improved species. But if a human being follows this example--asserting himself and disregarding the rights of others--we say that he is immoral.

Indeed there is no question but that those from whom Darwin received his examples were immoral. The struggle for existence was going on among *people* in nineteenth century England. Factory owners, in the absence of regulatory laws, were making fortunes and elevating their social standing. This was done by forcing women and children to work for twelve hours a day in miserable surroundings. Factory owners liked Darwin's writings because he gave them the idea that the struggle in industry was natural, as being among all living things, and in this way some industrialists justified their dealings.

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Struggle Based on Logical Deduction

Now it is true that, if the truth of this principle of forming improved kinds by struggle were well established, we would simply have to make the most of it. But it is not supported by modern findings. There is serious dearth of observation of the results of the process. "It must be admitted that even today our belief in the efficiency of selection depends on logical deduction rather than on the results of observation or experiment."²

Experiments actually give results which show that selection is not very effective. After a few generations of selection a certain strain of organisms has genes which are alike for a given character; then it is clear that it does not matter which seed is selected to plant, the progeny will be the same.

The example of Johannsen's beans is well known. By selecting beans of different size, Johannsen established strains which he kept growing in separate plots. As was expected, a large bean usually produced beans which were large on the average. He called these strains pure lines. Yet, when Johannsen selected large beans from a pure line, and also small beans from the same pure line, he found that they bore beans of the same size on the average. Selection within an isolated strain or pure line was ineffective.

The reason for this limitation of selection is that the genes for seed size were the same throughout the pure line. Within the line there was some difference in size, but this was due to environment rather than heredity. It is well known that changes caused by environment are not inherited.

Similar results have been observed in other species, but in those which are normally cross-pollinated it takes longer to reach the limit of effective selection than in beans, which are self-pollinated. In France, beets were selected for sugar, and from 1800 to 1878 the sugar content rose from 6 per cent to 17 per cent. From 1878 to 1924, however, the percentage remained 17 even though the same selection methods were used.³ (Figure 1)

The science of genetics has established the truth that genes remain the same indefinitely unless they mutate. Such changes take place only rarely; and few, if any, have been observed which are beneficial to the particular plant or animal. In the above examples, either there were no mutations, or none that made larger beans or sweeter beets.

Of course natural selection affects mutant plants and animals with the result that a large proportion die without leaving off-spring, because mutants have less vigor than normal or-



Figure 1. Limitation of Selection, shown by improvement of sugar beets. The best beets at the beginning of the project had 6 per cent of sugar. 78 years of selecting the sweetest ones for seed increased the sugar content to 17 per cent. But at that time, all the best genes had been sorted out and there was no further increase. Likewise, selection in nature can not make changes beyond certain limits. Selection does not give evidence that simple types of plants and animals changed into complex types.

Redrawn from *Heredity: a Study in Science and the Bible*. By W. J. Tinkle, St Thomas Press, Houston, Texas, 1967.

ganisms. Selection never forms new or improved genes, but only chooses among the ones which appear naturally. **Scientists never have observed the appearance of a new character which would aid in changing an order into a higher order;** for instance a lizard with a milk gland or a feather.

Influence on Human Behavior

But let us return to the influence which the doctrine exerts upon human behavior. If man evolved from animals, it is easy to feel that he still is an animal at heart with a veneer of civilization. And, if this evolution was accomplished by selfish initiative at the expense of other living things, it is easy to justify the same conduct now.

In all fairness we must admit, however, that there are proponents of evolution who advocate moral behavior.⁴ But the ethical obligations of scientists of which they write have been realized in spite of the doctrine of natural selection rather than because of it. The antisocial effects of the doctrine may be seen among persons whose moral characters are undeveloped, such as young people or persons who never have become morally mature. Our crime waves, which tend to become worse each year, are examples of the effect of selfish assertion.

There are many church people who are loath to disagree with scientists, and, therefore, they admit that evolution may be true, but add that God guided the process. These people do not achieve agreement after all, for in the doctrine of natural selection there is no provision for interference from the outside. It is just a free-for-all struggle.

Such church people do not know that it is unnecessary to accept such a doctrine in order to agree with scientists. There is a sizeable group of scientists who accept the doctrine of divine creation.

If we feel that man is an animal, we are in danger of losing our sense of responsibility, for

animals do not and cannot have this trait. Leading evolutionists do claim that man is an animal. G. G. Simpson⁵ states:

Man is not *merely* an animal, that is, his essence is not simply in his shared animality. Nevertheless he *is* an animal and the nature of man includes and has arisen from the nature of all animals. (*Italics are his*)

It is true that man has much in common with animals in a physical sense, but to claim that his mental and spiritual endowments have come from animals is not only inadequate—it is dangerous!

Conscience, Responsibility Important

Consider that little spark of divinity in the human heart which is called conscience. It makes one aware of doing right or wrong. If one has been taught rightly, and has not seared his conscience by repeated disobedience, it prompts him to do the best that he knows. Can you imagine an animal with such a mentor in its heart? It is most contented when its stomach is full, regardless of the method of filling that organ. It may learn to shun punishment, but it never feels remorse.

Of equal importance is man's sense of respon-

sibility, which an animal does not and cannot have. It is not alone in the Bible that responsibility is taught; every nation assumes it when it formulates laws. Animals are not responsible, laws are not made for them, but they are fenced in. This is exactly what will befall people, if they insist on adhering to the idea that they are animals, and therefore not responsible for their conduct. They will be fenced in by autocratic governments.

It cannot be denied that the doctrine of evolution by natural selection gives aid and comfort to dictators. Adolph Hitler and Benito Mussolini were logical, if you grant the validity of their belief. They overlooked the truth that man's inmost nature has come down from God above.

It is not only unproved, it is even dangerous to believe that man is the product of struggle among selfish, irresponsible lower organisms.

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SOCIAL DARWINISM

BOLTON DAVIDHEISER *

Social Darwinism has been used by unscrupulous industrialists to condone their unethical practices toward laborers and competitors. Darwinism also offered a basis for acts which have resulted in racial strife. Further, the Darwinian theory of evolution has been used by militarists to glorify war. Abuses toward multitudes of human beings have been sanctioned and abetted with evolution as an excuse; and, if evolution is not true, such inhumanity toward men seems all the more tragic.

Application of the principle of "survival of the fittest" to human affairs came to be known as Social Darwinism in the nineteenth century. It is generally believed that Darwin did not condone the extrapolation of his natural selection theory into social relationships, but the fact is that he himself taught that human evolution proceeded through warfare and struggle between isolated clans.

Robert E. D. Clark says, "Darwin often said quite plainly that it was wrong to ameliorate the conditions of the poor, since to do so would hinder the evolutionary struggle for existence."²

In a letter to H. Thiel in 1869, Darwin wrote:

You will really believe how much interested I am in observing that you apply to moral and social questions analogous views to those which I have used in regard to the modifica-

tion of species. It did not occur to me formerly that my views could be extended to such widely different and most important subjects.³

Wallbank and Taylor in their textbook *Civilization Past and Present* say that Darwin's theory of the survival of the fittest "became a vogue that swept western thought in the late nineteenth century. It also became a convenient doctrine for justifying various economic and political theories."⁴

Unscrupulous Men Misused Theory

Unscrupulous industrialists took advantage of Darwin's theory to condone their unethical practices. When they put others out of business, they declared that it was just another case of survival of the fittest.

The railroad magnate, James J. Hill, manipulating to get more railways under his control, said that "the fortunes of railroad companies are determined by the law of the survival of the fittest."⁵

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In his autobiography, Andrew Carnegie, who made his fortune in steel, describes his conversion to evolution on reading Darwin and Spencer as follows:

I remember that light came as in a flood and all was clear. Not only had I got rid of theology and the supernatural, but I had found the truth of evolution. "All is well since all grows better," became my motto, my true source of comfort. Man was not created with an instinct for his own degradation, but from the lower he had risen to the higher forms. Nor is there any conceivable end to his march to perfection. His face is turned to the light; he stands in the sun and looks upward.⁶

John D. Rockefeller declared to a Sunday school class: "The growth of a large business is merely a survival of the fittest. . . . This is not an evil tendency in business. It is merely the working-out of a law of nature and a law of God."⁷

Robert E. D. Clark comments, "Evolution, in short, gave the doer of evil a respite from his conscience. The most unscrupulous behavior towards a competitor could now be rationalized; evil could be called good."⁸

Darwinism Influenced Social, Racial Ills

Evolution soothed the consciences of not only the big industrialists in their dealings with competitors, it also aided those who took advantage of the poor. Efforts to improve the living and working conditions of the poor and of women and children were opposed by the ruling class on the grounds that this would be contrary to the principle of evolution, for the prosperity of the wealthy and the miserable condition of the destitute was just the working out of the principle of the survival of the fittest.

Darwinism also offered a basis for acts which have resulted in racial strife. Wallbank and Taylor say:

The pseudo-scientific application of a biological theory to politics . . . constituted possibly the most perverted form of social Darwinism. . . . It led to racism and anti-semitism and was used to show that only "superior" nationalities and races were fit to survive. Thus, among the English-speaking peoples were to be found the champions of the "white man's burden," an imperial mission carried out by Anglo-Saxons. . . . Similarly, the Russians preached the doctrine of pan-Slavism and the Germans that of pan-Germanism.⁹

Darwin postulated, in the sixth chapter of his *Descent of Man*, that the time would come when the white peoples would have destroyed the black. He also thought that the anthropoid apes would become extinct. He believed that when these two eventualities had occurred the evidence of evolution among living creatures would not be as strong as previously.

Militarists Used Darwinian Theory

The Darwinian theory of evolution has also been used by militarists to glorify war. They said that the outcome of a war is determined by the principle of the survival of the fittest.

The Prussian militarist, Heinrich von Treitschke, said, "The grandeur of war lies in the utter annihilation of puny man in the great conception of the State, and it brings out the full significance of the sacrifice of fellow-countrymen for one another. In war the chaff is winnowed from the wheat."¹⁰

The German philosopher Frederick Nietzsche, who held Christianity in contempt, said, "You say, 'A good cause sanctifies war'; but I say, 'A good war sanctifies every cause!'"¹¹ Wallbank and Taylor comment,

Likewise, he ridiculed democracy and socialism for 'protecting the worthless 'and weak and hindering the strong. Social Darwinism and the antidemocratic cult of naked power, as preached by advocates like Nietzsche, were laying the foundations of fascism, which would one day plunge the world into the most terrible convulsion in its history.¹²

Frederich von Bernhardi was a German soldier, who retired in 1909, and wrote an inflammatory book, *Germany and the Next War*, which extolled militarism. Of this book anthropologist M. F. Ashley-Montagu says,

"War," declared Bernhardi, "is a biological necessity"; it "is as necessary as the struggle of the elements of nature"; it "gives a biologically just decision, since its decisions rest on the very nature of things," "The whole idea of arbitration represents a presumptuous encroachment on the natural laws of development," for "what is right is decided by the arbitration of war." In proof thereof such notions of Darwin's as "The Struggle for Existence," "Natural Selection," and the "Survival of the Fittest" are invoked with sententiousness quite military both in logic and in sense. According to Bernhardi, it is plainly evident to anyone who makes a study of plant and animal life that "war is a universal law of nature." This declaration and fortification of Germany's will to war—for it had the highest official sanction and approval—was published in 1911. Three years later the greatest holocaust the world had ever known was launched. . . .¹³

Benito Mussolini, who brought fascism to Italy, was strengthened in his belief that violence is basic to social transformation by the philosophy of Nietzsche.¹⁴ R. E. D. Clark says, "Mussolini's attitude was completely dominated by evolution. In public utterances he repeatedly used the Darwinian catchwords while he mocked at perpetual peace, lest it should hinder the evolutionary process."¹⁵

Likewise Adolph Hitler in Germany based his fascism on evolutionary theory. This is evident from his speeches and his book *Mein Kampf*. R. E. D. Clark has pointed out that in the large number of books which have appeared describing every phase of the Hitler regime, there is hardly a mention of the evolution of Charles Darwin. He interprets this to mean that the authors refrain from mentioning evolution in this context because they fear they might be considered to be anti-evolutionary.¹⁶

Communists, Like Fascists, Used Darwinism

Friederich Engels, one of the founders of Communism, wrote to Karl Marx, December 12, 1859, "Darwin, whom I am just now reading, is splendid."¹⁷ Karl Marx wrote to Friederich Engels, December 19, 1860, "Although it is developed in the crude English style, this is the book which contains the basis in natural history for our views."¹⁸

Again Marx wrote to Engels, January 16, 1861, "Darwin's book is very important and serves me as a basis in natural selection for the class struggle in history . . . not only is it a death blow dealt here for the first time to 'teleology' in the natural sciences but their rational meaning is emphatically explained."¹⁹

Marx wished to dedicate to Darwin his book *Das Kapital*, but Darwin declined the offer.

E. Yaroslavsky, a friend of Joseph Stalin, wrote a book on the life of Stalin. This book was published in Moscow by the Communists while Stalin was in power. The author says, "At a very early age, while still a pupil in the ecclesiastical school, Comrade Stalin developed a critical mind and revolutionary sentiments. He began to read Darwin and became an atheist."²⁰

Yaroslavsky quotes another boyhood friend of Stalin, who relates the following:

I began to speak of God. Joseph heard me out, and after a moment's silence said: "You know, they are fooling us, there is no God. . . ."

I was astonished at these words. I had never heard anything like it before. "How can you say such things, Soso [a name for Stalin]?" I exclaimed.

"I'll lend you a book to read; it will show you that the world and all living things are quite different from what you imagine, and all this talk about God is sheer nonsense," Joseph said.

"What book is that?" I inquired. "Darwin. You must read it," Joseph impressed on me.²¹

But the Marxists were never completely sold on Darwinism. Conway Zirkle, Professor of Botany at the University of Pennsylvania, says that the Marxists do not accept or reject biological theories in accordance with objective evidence, but by how well they fit Communist doctrine. Darwinism does not altogether fit.

T. D. Lysenko, whose ideas supplanted the science of genetics in Russia until recently, said

in 1948, "Darwin was unable to free himself from the theoretical mistakes which he committed. These errors were discovered and pointed out by the Marxist classicists."²² Evolution by natural selection is at present not acceptable under Communism, but evolution by a Lamarckian type of environmental influence. (In his old age Darwin himself came closer and closer to this view.)

Some Evolutionists Embarrassed

There are a few evolutionists who have been embarrassed by the social implications of evolution and who have stressed cooperation (instead of struggle) as a factor in evolution. Kropotkin and Allee may be cited here.²³ Others have said that the theory of evolution is improperly applied when it is used to defend militarism and social abuses.

Of course, the application of Darwinian survival of the fittest to human affairs by unscrupulous men has no direct bearing on the question of whether human beings and other creatures evolved from simple forms of life. But these abuses have been sanctioned and abetted with evolution as an excuse; and, if evolution is not true, it seems all the more tragic.

References

¹⁶There is evidence of this in various places; for example, the disagreement between Darwin and Wallace on the evolution of the human brain. See also R. E. D. Clark, Darwin: before and after. and Arthur Kieth, Essays on evolution.

¹⁷Clark, Robert E. D. 1958. Darwin: before and after. Paternoster Press, London, p. 120.

¹⁸Darwin, Francis. 1896, Editor. The life and letters of Charles Darwin. D. Appleton and Co., N.Y. Vol. 2, p. 294.

¹⁹Wallbank, T. Walter and Alastair M. Taylor. 1961. Civilization past and present. Fourth Edition. Scott, Foresman and Co., N.Y. Vol. 2, p. 361.

²⁰Hofstadter, Richard. 1955. Social darwinism and american thought. Revised Edition. Beacon Press, Boston, Mass. p. 45.

²¹*Ibid.*, p. 45.

²²*Ibid.*, p. 45.

²³Clark, *Op. cit.*, p. 106.

²⁴Wallbank, T. W. and A. M. Taylor, *Op. cit.*, p. 362.

²⁵*Ibid.*, p. 362. (This is quoted from H. C. von Trietsche, Politics. Translated by B. Dugdale and T. de Bille. Constable and Co., London. Vol. I, pp. 66 and 67.)

²⁶*Ibid.*, p. 362.

²⁷*Ibid.*, p. 363.

²⁸Ashley-Montagu, M. F. 1961. Man in process. World Pub. Co., N.Y. pp. 76 and 77.

²⁹The encyclopedia britannica. 1962. Vol. 16, p. 27.

³⁰Clark, *Op. cit.*, p. 115.

³¹*Ibid.*, p. 117.

³²Zirkle, Conway, 1959. Evolution, marxian biology, and the social scene. University of Pennsylvania Press.

³³Philadelphia. p. 85.

³⁴*Loc. cit.*

³⁵*Ibid.*, p. 86.

³⁶Yaroslavsky, E. 1940. Landmarks in the Life of Stalin. Foreign Languages Publishing House, Moscow. p. 8.

³⁷*Ibid.*, pp. 8 and 9.

³⁸Zirkle, *Op. cit.*, p. 24.

³⁹Kropotkin, Peter. 1902. Mutual aid. W. Heinemann, N.Y. W. C. Allee. 1951. Cooperation among animals with human implications. Revised Edition. Henry Schuman, N.Y.

UNIVERSITIES AND COLLEGES HAVING THE CREATION POINT OF VIEW

WALTER E. LAMMERTS*

History

Seventh-day Adventists of the Northwest, with a constituency of only 1,551, founded Walla Walla college in 1892. The community was named College Place, a designation it still bears.

A faculty of eight and student body of approximately 100 have grown to a faculty of 100 and a student body of nearly 1,600. Last year 260 graduated.

The department of education and psychology now offers both B.A. and B.S. degrees with majors in elementary teaching and courses leading to secondary teaching certification with majors in 18 academic areas. On the graduate level the M.A. degree in education and the M.Ed. degree are offered.

The College is currently accredited by the Northwest Association of Secondary and Higher Schools, by the Washington Board of Education, by the Department of Baccalaureate and Higher Degree Programs of the National League for Nursing, and by the National Association of Schools of Music.

Campus and Student Body

Walla Walla College is located on a 55-acre campus in College Place, only four miles from Walla Walla in the historic Walla Walla Valley of Southeastern Washington.

Twenty buildings on the shaded campus range from the Administration Building constructed in 1892 (now housing administrative offices, Speech and Hearing Clinic, some classrooms and laboratories) to three new academic structures completed in the last three years. The new buildings are Smith Hall (education, psychology and teacher training center); the Fine Arts Center (music and art headquarters with the most modern facilities and equipment); and the Life Sciences Complex, housing the departments of biology, home economics, the School of Nursing, and the Human Dynamics Research Institute. A college gymnasium is now under construction.

A Marine Biological Station is located on 40 acres of beach and timberland at Rosario Beach, Anacortes, Washington. Facilities include an assembly hall, class and laboratories buildings, cafeteria and 29 cabins for staff and student housing. The School of Nursing utilizes facilities at the Portland Adventist Hospital, Portland, Oregon, for its clinical division.

Though the 1,550 member student body is drawn heavily from the Pacific Northwest, stu-

dents from 37 states and from 19 countries outside the U.S. are included. The student body is almost equally divided between men and women; 304 are married students.

The budget for a full-time resident student for the current year (1968-1969) may be summarized as follows: Tuition and fees: \$1370; room and board: \$670; books, transportation and miscellaneous: \$400. Several financial aids are available.

College Objectives

Walla Walla College is a Christian institution of higher learning operated by the Seventh-day Adventist Church to support the objective that true education "has to do with the whole being, and with the whole period of existence possible to man. It is the harmonious development of the physical, the mental, and the spiritual powers."

As a liberal arts college, the institution stresses a thorough general education in the humanities, mathematics, science, social science and the Christian heritage, as well as competence and depth in specified fields. Majors are offered in Accounting, Biblical Languages, Biology, Biophysics, Business Administration, Chemistry, Elementary Teaching, Engineering, English, Foods and Nutrition, French, German, History, Industrial Education, Interior Design and Decoration, Journalism, Mathematics, Medical Technology, Music, Nursing, Physical Education, Physics, Religion, Secretarial Science, Spanish, Speech, Speech and Hearing Therapy, Theology.

Instruction and research in natural sciences at Walla Walla College is conducted from the viewpoint that a correct understanding of the data obtained by direct investigation of natural phenomena, and the data communicated through divinely inspired testimony will always prove these data to be in harmony. Scientific observation and inspired testimony are taken as complementary witnesses to truth. A face-value acceptance of the testimony given in the Bible from Genesis through Revelation is considered basic to a correct understanding of our planet and the life which it supports.

Science Departments

The Department of Biology offers three degrees: B.A. and B.S. with a major in biology and M.A. in biology. A B.S. degree with a major in biophysics is offered jointly with the Physics Department.

The 1.25 million dollar Life Sciences Complex was completed in 1967. Facilities include nine teaching laboratories, and specialized facilities such as museum, greenhouse, animal house, and radioisotope laboratory. Donald W. Rigby,

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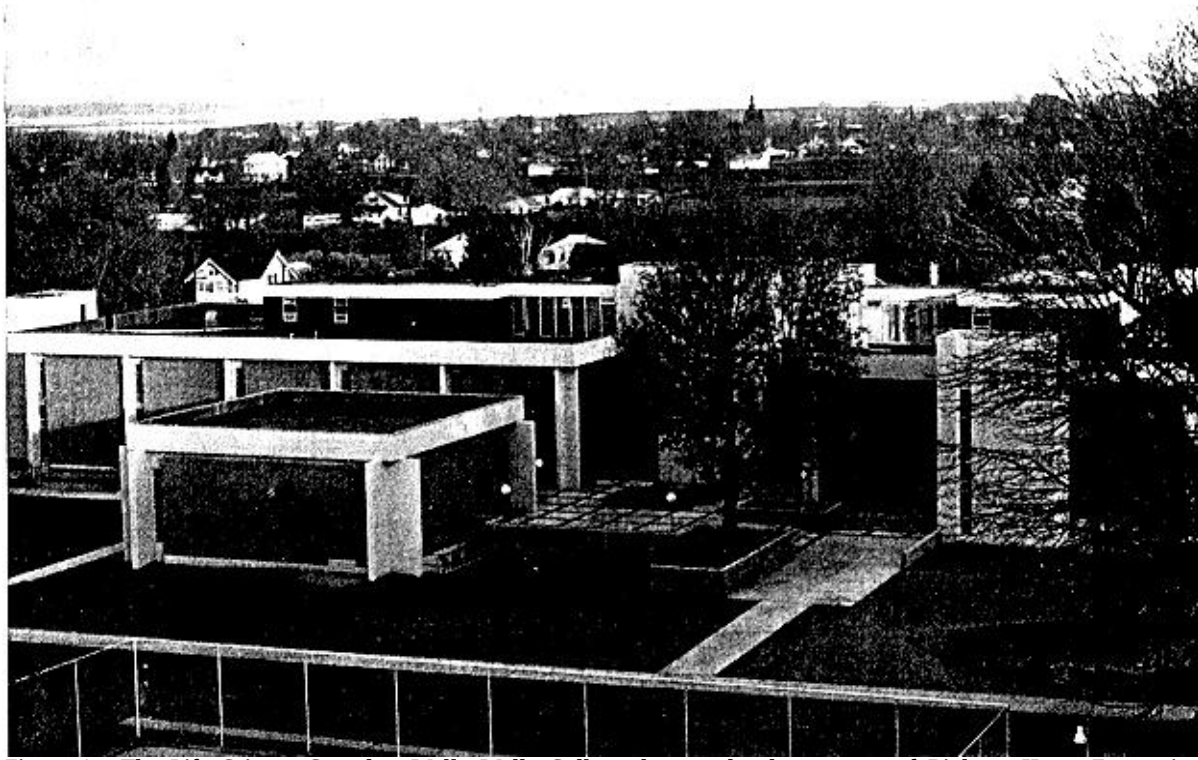


Figure 1. The Life Science Complex, Walla Walla College, houses the departments of Biology, Home Economics, the School of Nursing, Human Dynamics Research Institute. Left foreground: amphitheater; upper left penthouse on roof provides animal housing, upper right greenhouse. Home Economics facilities in a right wing extending to the rear.

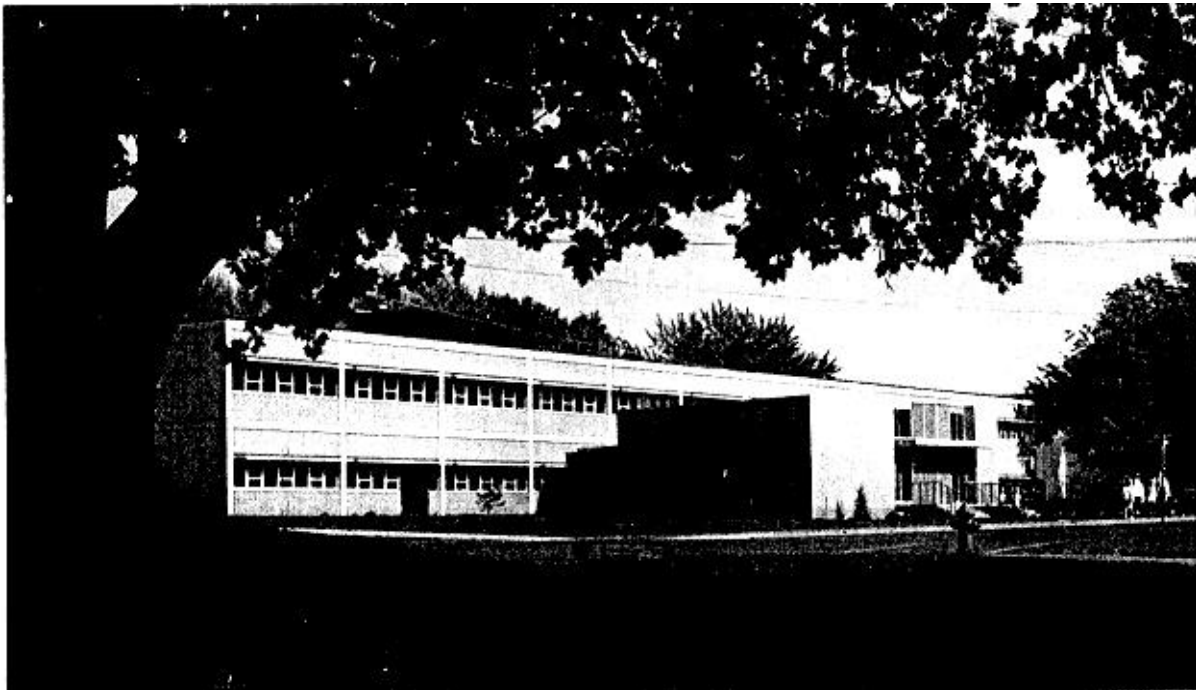


Figure 2. Kretschmar Hall, Walla Walla College with classrooms and laboratories for physics, engineering and mathematics. Physics Lecture Hall in foreground.

Ph.D., is professor of biology and chairman of the department. Assisting him are Donald F. Blake, Ph.D.; John F. Stout, Ph.D.; Carl A. Forss, Ph.D.; and Albert E. Grable, Ph.D. Parasitology, ecology and taxonomy are their research areas.

The Department of Chemistry, which offers both B.A. and B.S. degrees with majors in chemistry, is located in Bowers Hall, which is equipped with a lecture hall, classrooms, library, four general laboratories, and one instrumental laboratory. Carl T. Jones, Ph.D., is professor of chemistry and chairman of the department. He is assisted by James R. Chambers, Ph.D., and Clarence E. Chinn, Ph.D. These men are doing research on fatty acids in blood, organic syn-

thesis of phosphorus compounds, and liquid extractions with radioactive tracers, respectively.

The Physics Department, which offers both a B.A. and a B.S. degree with a major in physics, shares Kretschmar Hall, completed in 1964, with mathematics and engineering departments. Claude C. Barnett, Ph.D., is professor of physics and chairman of the department and is assisted by Donald E. Hall, Ph.D., and Joseph W. Hutcherson, Ph.D. These men are conducting research on relativity and bioluminescence, plasma astrophysics (theoretical), and continuation of vacuum ultraviolet spectroscopy started at Oakridge Institute of Nuclear Studies.

THAT WHICH HAS BEEN CREATED SHOULD BE CONSERVED

HAROLD ARMSTRONG*

To read the daily newspaper is to become exposed to the need for conservation. The earth, plants, and animals have all been misused by many men. Such actions are of particular concern to the creationist because of faith in the Creator and loyalty to His Word. Many specific instructions are given in both the Old and New Testament pertaining to treatment of the earth, of plants and of animals. By analogical studies of God's Word, we can know of God's evident wish to preserve the different and the unique, and we can know that we should not pervert the earth from its own nature.

In Revelation 11:18 we find these remarkable words: "(O Lord God Almighty, the time is come that Thou . . .) shouldst destroy them which destroy the earth." What does this mean? There is a similar portion in Daniel 7:23: "The fourth beast shall be the fourth kingdom upon earth, which shall be diverse from all kingdoms, and shall devour the whole earth, and shall tread it down, and break it in pieces."

To a reader in St. John's time, let alone in Daniel's, these words must have been incomprehensible. How could men destroy the earth? But now we can (almost) say of this what was once said for a happier reason: "Today is this scripture fulfilled in your ears." (St. Luke 4:21)

There is much talk nowadays of conservation. The danger is that while the talk is going on, a combination of greed and short-sightedness could actually "destroy the earth" as a place to live. The point to be made here is that creationists might very well take a special interest in conservation.

Conservation Is Needed

To be convinced of the need for conservation, we have merely to read the newspapers. The Great Lakes, we read, are rapidly being polluted, Fish are dying, swimming-places are being

spoiled, cities using water from the lakes have to use more and more chemical treatment, which leave the water less and less palatable.

Indeed, it sometimes seems that the very existence of the lakes is in danger. A year or two ago, too much water was being removed through the St. Lawrence Seaway and the Chicago Drainage Canal, and the level of the lakes was going down. This danger seems now to have been arrested, at least for the present; but if more water is taken out than flows in, there can be only one result.

Moreover, erosion of the surrounding land is causing much sediment to wash into the lakes; In the not too distant future, Lake St. Clair, for instance, seems to be in danger of actually filling in.

If we look to the west, we see the same kind of thing. Many men can still remember what happened on the prairies in the years right after 1930; dust storms were most common because the land had been overworked. Happily these conditions have not been repeated lately, at least not in so big a way; but the threat is still there. Yet farther west, in California, for instance, we see the whole face of the country being changed—and not for the better—by too much concentrated building in formerly highly productive orchard and farm lands.

Nor have plants and animals fared any better than the earth itself. In Kingston, fine old elm trees are dying off—victims of a plague intro-

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duced to this continent some years ago. Outside the city, trees are being butchered by the thousands as roads are widened. In California, again, grading and the construction of roads (in particular) threaten to destroy many native species of plant; the fine work of the California Native Plant Society is perhaps about the only thing being done to ensure continued existence of many plants.

As for animals, we know what happened to the passenger pigeon. Other kinds of birds, we hear, also are threatened with extinction, for reasons such as the destruction of forests and the indiscriminate use of poisonous sprays. In Africa and India, many of the animals for which those parts are famous have declined in numbers, until they too are threatened with extinction.

And even life in the sea is not safe; too much hunting has endangered the continued existence of many kinds of whale. And I could go on and on—but why take up the space? Everyone knows about these things. For that reason, too, because these facts are well known, I have not given references.

Why Special Creationist Concern?

So much for the facts. But why, it may be asked, is this a matter of special concern to creationists? The answer is simple, a creationist is a creationist, not out of devotion to any abstract notion of creation, but out of faith in the Creator, who cannot lie (Hebrews 6:18), and out of loyalty to His word. Now where action is called for, faith without action is not very profitable (St. James 2: 17). So let us inquire whether God has said anything about our care of the world.

In Genesis 1:28 God said to our parents ". . . subdue it (the earth), and have dominion over the fish . . . and every living thing that moveth upon the earth." Now the word translated "subdue" is rendered "keep under . . . (for bondsmen) . . . "i.e. "make servants of" in 2 Chronicles 28:10, and "have dominion" is applied to Christ in His Messianic reign in Psalm 72:8. (For surely this Psalm looks beyond Solomon, although it may well apply to him also.)

So here is the relation between us and the earth; it is to stand to us in the relation of a slave to his master, or of a subject to his king. Does that entitle us to abuse it? Certainly not! On the duties of masters we have only to read Exodus 21:2; Deuteronomy 15:12; and Ephesians 6:9. The duties of kings—of rulers—are treated also in Deuteronomy 17:16-20; Proverbs 31:4,5; Ecclesiastes 5:8; and Daniel 4:22-25.

God's covenant with Noah after the Flood (Genesis 9:1-7) does not change this; the notion of "in one's hands" in verse 2 is often applied to mean in one's care, as in Ecclesiastes 9:1 (and may I, for the sake of its eloquence, mention Wisdom 3:1)

So the conclusion is that God put us to rule (under Him) over His creation, and that thus we are His stewards, accountable to Him. We may use the products of the earth to maintain ourselves in a reasonable style, as a king may collect reasonable taxes from his people, and as a steward may maintain himself in a fitting style from the proceeds of the estate. But if we go beyond that we are no longer kings, but tyrants; no longer stewards, but embezzlers.

Specific Instructions Given

As well as this general principle, has God given us any more specific instructions? He has. Concerning our dealings with animals we may consider Exodus 23:4; Leviticus 19:19 and 22:28; and Deuteronomy 25:4; 22:6, 7, and 10. Even trees come in for some thought in Deuteronomy 20:19, 20; and the earth (or land) itself in such passages as Exodus 23:11.

Although it is somewhat apart from the main topic, commandments pertaining to animals are noteworthy. We may use them, but we are to do it humanely, and, it would seem, are to interfere as little as possible with their nature. Alas, how many practices are common today which would never stand up to God's standards here!

A case in point is the method, which is now becoming common for keeping chickens in which they pass their whole lives (if it can be called life) in cages hardly bigger than themselves. Is this natural? Is artificial insemination not an affront to the animals on which it is practiced? I mention these practices because, while common, they are not so obvious; great and obvious cruelties need not be mentioned here. But God knows about them, and perhaps in these cases it may be said, as it is of the fatherless, ". . . their redeemer is mighty, and He shall plead their cause with thee." (Proverbs 23:11.)

To return, though, to the earth, and conservation, what can we say about it? There is not so much in Scripture in the way of explicit direction about this matter, although there is the commandment already mentioned, in Deuteronomy 20:19, 20.

But may we proceed here by analogy? For if we are to see the analogy between murder and hatred, as in St. Matthew 5:21, 22, or between feeding oxen and maintaining ministers of the Gospel as in 1 Corinthians 9:9, 10; may we not see comparison between proper treatment of animals (which, as has been already mentioned, comes up in a number of places in Scripture) and proper treatment of the earth itself.

If, then, we follow this analogy, where does it lead us? Well, first of all, there is God's evident wish to preserve that which is different, which is unique. In human affairs, this shows

up in the provisions to ensure that a name "... be not put out of Israel" (Deuteronomy 25:6 and thereabouts). As it pertains to animals (or, rather, birds), the law of Deuteronomy 22:6, 7, seems to have the same purpose.

If, then, we follow the analogy, we shall respect the unique and remarkable features of the earth. We shall not dam up, and spoil forever, a beautiful canyon, in order to get a few more kilowatts for brighter neon signs. We shall not cut down redwoods, going back maybe to the Flood (see *The Genesis Flood*, p. 392) in order to have a few more barbecue tables. Nor shall we destroy the whole race of whales for selfish reasons.

Secondly, we should not pervert the earth from its own nature. Sometimes it may not be too clear just what this nature is, but it certainly is not to be scraped flat and buried in asphalt. Nor should we take away the trees and leave the land to wash away, nor should we pollute the lakes with sewage. (This last point, incidentally, is already dealt with in Deuteronomy 23:12-15).

It may be said that, if we were to try to follow these principles, we should not have enough food. But would God's answer not be, as it was in another connection, "... all the land shall yield her fruit, and ye shall eat your fill. ... I will command my blessing upon you, and it will bring forth fruit. ... " (Leviticus 25: 19-21.) In any event, it would seem that, in the long run, almost any course is likelier to keep us fed than our present course of ravaging the ultimate source of all our food.

What can we do about the matter? Well, we may conserve the earth and its resources, and refrain from destroying them, wherever we have the power to act. We may persuade and urge

others, so far as it lies in us, to do likewise.

For we are God's witnesses-his spokesmen-and, while our main business is with the Gospel, yet we may well also proclaim God's will on temporal matters. In so doing, we should be following a line of distinguished predecessors, such as Joseph, Daniel, Mordecai, and Nehemiah; and we might even get a hearing for the Gospel if, in temporal matters, people could say "we saw certainly that the Lord was with thee. ... " (Genesis 26:28). And finally, we can lend our encouragement and support to groups working for conservation.

What Success Expected?

There is one more point that could be made here. What kind of success do we expect for our efforts? Our success, in a sense, will likely be something less than complete, for the suffering of the earth, in which truly "... the whole creation groaneth ... " (Romans 8:22) will probably not be healed until the "times of the restitution of all things." (Acts 3:21.)

In fact, in this, as in many other things, the best that we can do is probably, so to speak, just first aid. The complete cure must wait until Christ returns, when "... the desert shall rejoice, and blossom as the rose ... " (Isaiah 35:1). Yet meanwhile we are to do what we can.

It is even so with the Gospel itself: we are to be witnesses; yet "... when the Son of man cometh, shall he find faith on the earth?" (St. Luke 18:8.)

Likewise in temporal matters, let us cleave to God's will, remembering that "... the righteous, and the wise, and their works, are in the hand of God. ... " (Ecclesiastes 9:1) and that "... if our earthly house of this tabernacle were dissolved, we have a building of God. ... " (2 Corinthians 5:1).

COMMENTS ON SCIENTIFIC NEWS AND VIEWS

HAROLD ARMSTRONG*

A thoroughgoing Flood geology must provide an explanation of how sediments, mud and sand hardened into sedimentary rocks at the end of the Flood, in a fairly short time (surely no more than, at most, a hundred years).

One of the best ways of showing that something is possible is to show that it actually happens, or has happened. Thus it would be of interest to find a case in which materials harden into stone.

Now an artificial stone, called "Angelstone" is in fairly common use. It is made by Angelstone,

Limited, at Preston, Ontario. According to the company Manual RAIC.AIA FILE NO. 8,

... a unique process for manufacturing fine quality stone was developed. Natural silicious sands are ground and combined with stable oxide pigments and active chemical constituents, then subjected to intense pressure, heat, and autoclave curing. The surfaces of the particles interact with one another—they are not just surrounded by cement paste as in ordinary concrete. The techniques used parallel those of nature herself and the resulting sandstones closely resemble the quarried product.

The "Angelstone" does, indeed, (to one who

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is not a geologist, at any rate), look very much like natural sandstone.

It would seem, then, that there is nothing at all unreasonable in supposing that sediments hardened into stone in a quite short time. And if so, then it could easily have happened after the Flood.

Incidentally, it has been said, and truly, that the existence of fossils shows that the bodies of organisms were buried quickly, for had they remained long on the surface, they would have been destroyed by the elements and by scavengers. Is it not also true that fossils provide evidence that the material in which the bodies were buried hardened soon thereafter?

For in loose earth or sand, we know that after a hundred years there would be little left of a body. Dead fish are washed up onto the shore, but are remains of them found at any depth in the sand of the beach? Or are dead animals found buried in sand dunes? No, a catastrophe, followed by quick burial, followed by quick solidification is the only answer.

My thanks are due the branch of Angelstone, Limited, at Kingston, for information about their product.

Reliability of Argon-40 Dating

The question of the reliability of ages of rocks obtained by Argon-40 has been discussed frequently in the publications of the Society. Thus it is not necessary to describe the method again, but on the question of reliability some interesting evidence has appeared.

This concerns samples of submarine pillow basalt¹ from Kilauea volcano, Hawaii. While the samples were judged to be, at most, a few thousand years old, the ages indicated by Argon-40 ranged from 100,000 to 40,000,000 years. It was concluded that the indicated age depends on hydrostatic pressure and on the rate of cooling, which would be affected greatly if, e.g., the sample had hardened under water, and that "many submarine basalts are not suited for potassium-argon dating."

If we consider the enormous amounts of basalt that were probably deposited under conditions such that they were very subject to hydrostatic pressure and cooling, e.g., on the first or second days of Creation, and later during the Flood, we wonder whether there will be any basalt, unless, perhaps, it be quite recent anyway, which will be "suitable for potassium-argon dating."

Suggestion on Radio Emissions

Recently the study of radio astronomy has shown that, as well as the "radio stars," which are being studied, there is a faint background of radio emission, mostly detected as microwaves, which comes to us from the whole heavens. It

seems to be quite isotropic, coming from everywhere and in all directions.

The reason that this is being studied seems to be especially that it makes difficulties—possibly fatal ones—for the "steady-state" theories of cosmology. This problem seems to be new enough that there is not yet much in the literature on it, but my colleagues in radio astronomy tell me that there might well be a review before too much longer.

My purpose here is just to suggest a possible line of thought about this matter. It has sometimes seemed puzzling that, as recorded in Genesis, light was created on the first day, but the heavenly bodies not until the fourth day.

At the Creation, we are told, there was first darkness. This could have been the "evening" of the first day; before that, there was nothing; in fact, in a sense, there was no "before." Then there was light, and that was the morning of the first day.

This light did not come from definite bodies as it now does, but from some diffuse source. This state of affairs lasted until the fourth day, when God gathered the source of light into definite bodies. It might be noticed that God made, not created, the heavenly bodies, and the Hebrew word translated "made" seems often to mean to make out of existing material.

If this is so, then the isotropic radiation which is being studied now is something like—we might call it a "remnant" of—the uniform light which the earth experienced for its first three days.

All this is just, at this stage, offered as a suggestion. It may be that some one will be able, by thinking further along these lines, either to deduce something else about what happened at Creation, or else to use what we know about Creation to get some further idea about this background radio emission.

On the End and the Beginning

Often the beginning is explained by the end. May I suggest that the end, the book of Revelation, may throw some light on the beginning, Genesis, about two points which are sometimes puzzling?

First of all, there is the matter that the sun and other heavenly bodies were not created until the fourth day. It might be in order to suggest that this is emphasized for a special reason, because the Holy Ghost foresaw that the "day-for-an-age" theory would arise.

But if that theory is brought in, the Scriptural order of creation must go out, for nobody would maintain that the world went on for ages without the sun. St. James told us that "whosoever shall keep the whole law, and yet offend in one point, he is guilty of all" (St. James 2: 10). Per-

haps whosoever believes the whole Scripture, and yet denies one point, may as well deny all.

But the sun was created on the fourth day. Whence came the light before that? In the New Jerusalem "the city had no need of the sun, neither of the moon, to shine in it: for the glory of God did lighten it, and the Lamb is the light thereof." (Revelation 21:23)

In some ways, the New Jerusalem seems to restore the original order of things. In view of this, is it not likely that the glory of God was quite literally the light of the world during the first three days?

Again, in the new earth ". . . there was no more sea." (Revelation 21:1) Is this, too, a restoration of the original state of affairs? If the Flood was caused by the falling of the canopy, and the water still remains on the earth, before the Flood there may well have been "no sea," compared with what there is now. Maybe the "restitution of all things" (Acts 3:21) means "all things" quite literally.

Irreducible Structure of Life

Although the fact that evolution is untrue would be sufficient reason for opposing it, we have a stronger reason for attacking the theory of evolution in that it must needs be an ungodly theory. Yet, there is another (although, perhaps, related) ungodly theory: that of materialism.

While materialism is not, maybe, so open an attack on the faith once delivered to the saints, yet in some ways materialism is worse, for it is not confined to one subject, but has infected the whole of science.

A recent article,² which, incidentally, is not arguing particularly for any Christian position, shows the futility of the usual brand of materialism. The article is particularly about life and its irreducible structure-irreducible, i.e., merely to laws of physics and chemistry.

Consider, the argument goes, a machine, e.g., a typewriter. Its structure follows the laws of physics and chemistry, it is in accordance with them, but it can not be explained by them. The structure might be called a "boundary condition" on the physical laws.

Recall that when some physical problem is expressed in the form of a differential equation, we have merely a general statement; to find out about any particular case we need a "boundary condition": what happens at the beginning, or at the end, or something of the sort. The relation of the structure of the typewriter to the laws of mechanics is something like that of the boundary conditions to the differential equations.

Instead of the two levels which we have considered, the mechanism and the laws of mechanics, there may be several, in a hierarchy. Consider, e.g., the series: voice, words, sentences, style, a text. "Each level . . . relies for its work-

ings on the principles of the levels below it, even while it itself is irreducible to these lower principles." (p. 1310) For instance, the utterance of words depends on the voice, but words cannot be explained by voice considered merely as a sound. Now such a hierarchy, it is suggested, is: physical and chemical behaviour, life, consciousness, . . .

This could, perhaps, be stated in the old way; each of the levels serves as "matter," to be given "form" to produce the level next above. Voice, e.g., must be given form to produce words; words are given form-i. e., arrangement—to produce sentences, etc.

One is reminded of Aristotle's ". . . series, each successive term of which potentially contains its predecessor, e.g., . . . the sensory power the self-nutritive." Or the Scholastic view that each level contains virtually (potentially) the perfections of the levels below it; living beings, e.g., do all the things considered under mechanics just as well as a stone would, but moreover they have powers which a stone totally lacks.

If this is granted, then it must be that any explanation of living beings in terms of DNA, which some seem to wish for so much, would be at least incomplete. It is suggested that DNA would seem to evoke, rather than to determine, the higher levels (e.g., the animal as a whole, and, still more, consciousness.)

It is concluded:

The idea, which comes to us from Galileo and Gassendi, that all manner of things must ultimately be understood in terms of matter in motion is refuted. . . . The universal topography of atomic particles . . . which, according to Laplace, offers us universal knowledge of all things is seen to contain hardly any knowledge that is of interest. (as for) The claims . . . to the effect that all study of life could be reduced to molecular biology . . . the analysis of the hierarchy of living things shows that to reduce this hierarchy to ultimate particulars is to wipe out our very sight of it. (p. 1312)

Above life, it is proposed, there are yet higher "boundary conditions," extending, in man, to consciousness and responsibility.

It might be remarked that we find that the lower levels are for the sake of the higher, e.g., voice is for the sake of words which are for the sake of sentences, etc. This suggests that generally it is well to consider "that for the sake of which," i.e., the final cause, so that (as we Creationists believe on other grounds), teleology should be re-introduced into science.

Symbiosis: An Evolutionist's Nemesis

Symbiosis, the living together of different creatures, (let me, as a Creationist, be consistent and

say "creature" instead of "organism"), can only be an enormous difficulty (if we may call what is really a disproof a "difficulty") for the theory of evolution. Obviously adaptations of the two creatures involved mutually would have to arise simultaneously, but independently.

This would be like the situation where one locksmith made a lock, and another, working independently, made a key, and, when they met, they found that the key would work the lock. Even with things of the rather modest complexity of locks, such a happening is most unlikely; and, when we consider the complexity of even the humblest of creatures, it passes all belief.

A case of symbiosis, of great importance to us, is that of the nitrogen-fixing bacteria which live on legumes. A recent article,³ in discussing this, reminds us that the whole process might cause us to wonder, for ordinarily nitrogen is rather inert. Artificial ways of fixing nitrogen involve strong chemicals, high temperatures and pressures, electric arcs, etc. Yet the bacteria perform their task under quite ordinary conditions.

There is much variety among these bacteria. Some can continue their life outside the plant. Others, for instance the *Rhizobium*, assume a degenerate form—a "bacteroid"—inside the root nodule, and work under these conditions.

Another fact is that, in terms of energy, the process of fixing is rather inefficient. This is another reason for doubting that it could ever have arisen by "survival of the fittest."

The way in which, with the help of these bacteria, plants live, partly, on air, is remarkable. May I suggest though, something more remarkable, (as the facts that we have been considering help to show): the way in which the theory of evolution has, for these many years, "lived" so largely on hot air?

Problem: Oblateness of the Sun

Some recent studies⁴ of the sun and its oblateness have suggested that one reason for oblateness may be due to rotation. (Just as the earth has the "centrifugal bulge" at the equator.) Now the rotation of the surface, (a reasonably definite thing, although the sun is not solid), can be seen, e.g. by the motion of sun spots. Studies suggest that the interior may be rotating several times as rapidly as the surface.

Present interest in this matter is due largely to the fact that the oblateness would affect the orbits of the planets, especially that of Mercury. Thus the peculiar behaviour of Mercury, which is said to be a confirmation of the theory of relativity, could be really due to a totally different cause.

Creationists will not worry much about this aspect of the matter. We shall consider Psalm

115:16, and Deuteronomy 29:29, and recall that since human beings are fallible, so, likely, are human theories. Most theories have a range of usefulness; all have weaknesses if we press them far enough. There are no "crucial experiments" to tell us that such-and-such a theory is right; all that experiments can tell us is that it works, or fails to work, under such-and-such conditions.

There is, though, in all this, quite another point which may interest us. If the interior and the exterior of the sun are rotating at different speeds, the friction—or call it what you will—must be enormous. It would be vastly greater than the tidal friction on the earth, for the earth and the oceans are not rotating at different speeds.

Is it reasonable to believe that this friction may have continued for untold ages, as the evolutionary theories would have us believe? I think not.

Nor does it seem likely that the difference could have arisen recently. In the first place, what would have started it? In the second place, such a change, had it happened, would surely, "by mixing, etc., have changed the sun's output of heat. But evolutionists believe that such heat output has not changed for a very long time.

Maybe this rotation of the sun can help show us that there is something else which is "going around in circles," viz.: the evolutionary theory.

Thoughts on Cosmology

A recent article in *Science*⁵ contains a discussion of the present state of cosmology. A summary of reasonable length would not be very helpful; it seems better just to call it to the attention of those interested. The conclusion is that no theory is free of difficulties; in fact, all theories involve what may well be unwarranted assumptions.

For instance, it is usually taken for granted that the laws of physics have always been the same. Thus, if the universe came into being, it is assumed that the laws "were there waiting for it." But the laws of physics have to do with the behaviour of things; does it make any sense to talk of them as existing in an empty universe?

On the other hand, "continuous creation" assumes that matter comes into being from no source and for no reason. Now nobody even claims to have observed such a thing happening. But there are a good many people who believe that they have observed God's intervention in the affairs of the world. By any reasonable standards, should we not believe that for which there is some evidence, rather than that for which there is none at all? Then we should ascribe the universe to God's intervention, i.e., to Creation.

The article also contains an interesting quotation from Maxwell:⁶

In the heavens we discover . . . stars so distant that no material thing can ever have passed from one to another; and yet . . . each of them is built of molecules (or atoms or ions) of the same kinds that we find on earth . . . no theory of evolution can be formed to account for this similarity of the molecules . . . on the other hand, the exact equality of each molecule to all others of the same kind gives it . . . the essential character of a manufactured article and precludes the idea of its being eternal and self-existent.

Wheeled Vehicles of Recent Date

A recent article⁷ describes some evidence about ancient wheeled vehicles. The evidence comes partly from old pictures, partly from actual remains which have been preserved in one way or another. The conclusion seems to be that the first wheeled vehicles (of which we have any record, of course), were made in northern Mesopotamia a few thousand years ago.

Does it not seem remarkable that practically all the inventions which we can trace seem to go back to this same origin: Mesopotamia, a few thousand years ago?

From the Biblical account, though, this is just what we should expect to find. For Mesopotamia, a few thousand years ago, was the place and time of Noah and his family, the survivors of the Flood. From here mankind spread out to re-occupy the world; naturally they took with them the arts and sciences, which they had known before the Flood. Just so, if we were to trace the spread of stone buildings, (for instance) across the North American continent we should find it spreading from the east coast, because people already having the art landed there.

In conclusion, it might be suggested that the spread of mankind, after the Flood, is a phenomenon which should be traceable, by methods of archeology. It is to be wished that someone, believing the Biblical account, might undertake such an investigation. We know that Flood geology is a fruitful investigation; it seems likely that the same could be said of post-flood archeology.

Insects Use Spines to "See"?

In recent studies, it has been reported that certain night-flying saturnid moths, such as the cecropia moth (*Hyalophora cecropia* L.) and the tulip-tree silk moth (*Callosamia angulifera*) have groups of transparent spines on the first two joints of the antenna. There are also such groups of spines on the joints of the legs in these and other night-flying insects.⁸

It is suggested that the groups of spines may be dielectric waveguides, or antennae, of the

sort which has just recently become of some importance in microwave engineering.

Just as microwaves may be transmitted along the inside of a hollow pipe, or, (as is more surprising), along the outside of a wire or rod, just so, under suitable conditions, they may be transmitted along the outside of a dielectric rod.

And just as an array of metal rods can act as an antenna for radio waves or microwaves, (in these days of television an example can be seen on practically every house), so, under suitable conditions, can an array of dielectric rods.

The dielectric constant and other features of these spines seem to make them very suitable for the purpose. Because of their small size, however, these antennae are suitable, (not for television programmed or for microwaves, but) for electromagnetic waves in the regions of visible light or of infra-red.

The suggestion seems to be that these organs act as receptors of light, to tell the moth to keep quiet during daylight. However, this seems to be an extremely complicated way of accomplishing a simple purpose.

Might it be that these organs are actually detectors of infra-red light? Anything at a temperature higher than that of its surroundings gives off infra-red, and perhaps it may be detected thereby at night; such detection has had military applications.

An array of rods, like a television antenna, can be quite directional; thus, might it be that these spines are a better way of "seeing" at night than any eye designed for infra-red could provide?

In any event, it would appear that these organs, like so many others, would have to be fully developed to work at all. It is impossible to see how they could have "evolved."

Radioactivity and ESP

H. Schmidt, a physicist, has described some very curious findings. He built a random-number generator, in which the randomness came from the randomness in the radiation from a radioactive material.

During tests of the device he found that some people could (a) predict the number which would be generated, and (b) even will the generator to generate certain numbers, with a success far greater than would be expected by probability.

Of course, we have heard of extra-sensory perception and such things for years; but this is perhaps the first time that such phenomena have been linked with something as elemental as radioactivity.

It may be that Christians should be very cautious about taking much of an interest in such things. In the first place, such happenings may seem uncomfortably close to things which are

denounced in Scripture as sorcery. In the second place, too great an interest in such things might make us seem overly credulous, and such a reputation would do no good to our witness, either as Christians or as Creationists.

Yet there is one point here, at least, which may call for some thought. We are much concerned with the question of the dating of rocks and deposits by radioactivity. If the decay of radioactive material is influenced in some way, not yet understood, in Schmidt's experiments, might it not have been influenced in some other way, not yet even suspected, at some time in the past?

Nature and Mechanism

Nowadays functions which happen in living beings are often compared to some mechanical process. For instance, the action of the mind to a computer, or the growth of the proteins to the making of something according to templates.

Should we not conclude, though, by induction, that such comparisons may well prove nothing, and they certainly do not prove that the function of the living being is like the mechanical process in anything except the job which it accomplishes. (And even in that the resemblance may be more superficial than real.)

For consider some of the things which are done by both living beings and machines; rarely, if ever, are they done in the same way. For instance, various living beings have various ways of moving about on land; we can think of walking with different numbers of feet, of the crawling of snakes, and of the motion of earthworms. But machines imitate none of these, but depend on turning wheels.

As for flying, in nature, flapping wings are the common thing. But aircraft with flapping wings have never been very successful. Of successful artificial means, the aeroplane is something like the natural way; the helicopter, little like it; and the balloon, not at all. Or consider keeping cool; the natural way is by evaporating water, the artificial usually by compressing and expanding gases and fluids.

Thus we see, in cases about which we know, that the natural way of doing something is rarely much like the artificial. Is that not likely true also of things about which we do not know, and that the mind, for instance, is really not at all like a computer?

As for the notion that we shall learn the "secret of life" by studying, e.g. computers, I offer an apt quotation:

For health he calleth upon that which is weak: for life prayeth to that which is dead: for aid humbly beseecheth that which hath least means to help: and for a good journey he asketh of that which cannot set a foot forward. (Wisdom 13:18) From Wisdom of Solomon, one of the apocryphal books of the Old Testament.

A Parable for Evolutionists

An Englishman and an Irishman were discussing advances in science in their respective countries in old times. "Have you heard?" asked the Englishman, "about the ruined castle in England which was explored recently? In it were found many wires, which shows that they knew about the telephone in England hundreds of years ago."

"Sure," replied Pat, "and have you heard about the ruined castle in Ireland which was explored a while ago? In it they found no wires at all, and that shows that they knew all about the wireless in Ireland hundreds of years ago."

Are not some of the arguments for evolution rather like Pat's argument? Or rather, are they not worse? Pat's case was at least not self-contradictory; an absence of wires could go along with wireless.

In evolution, we are invited (nay—almost ordered!) to conclude from the absence of any remains of transitional forms, missing links, or whatever they be called, that such things existed. Some of us, at least, must beg to be excused; we simply can not perform such a feat of reasoning. We have to accept the canons of evidence of Deuteronomy 17:6; and the two or three witnesses for evolution cannot be found.

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LOGICAL ACCURACY

WILLIAM J. TINKLE*

A senior citizen with "patches of snow upon the roof" remarked very seriously. "I have observed that, when I live through January and February, I always live the balance of the year."

Now, just why does one smile at such a statement? If the gentleman meant that he was grateful for a long life, there is nothing to criticize. But he strongly inferred that he used his experience to predict the future. The inference is that there is some dangerous condition, perhaps the weather, in the first two months which alone is responsible for death.

What is wrong with this method of reasoning? It was based upon observation, not spun from "armchair" reasoning. Were the observations too few? Eighty-five notations are more than many a scientist makes. Did he disregard exceptions? There were none; not a single one.

Is it incorrect to draw inferences from observed data? But this is the very heart of the scientific method. One of our greatest scientists, Louis Agassiz, often said, "Facts are stupid things until they are brought in line with underlying principles."

Then where was the fallacy of the observant senior citizen? His observations were in a very

narrow field, which excluded the experience of countless persons who start the year well but meet disaster before its close.

It occurs to me that this little joke is more than a bizarre and unusual occurrence. Many times the conclusion reached is colored by rejection of certain *kinds* of facts. The field of observation, limited by the criterion which the scientist holds for significant data, is too narrow, and the conclusion may be incorrect. By rejecting kinds of data which he dislikes, he arrives at the wrong principle.

For instance, in attempting to account for the origin of living things, there are observations which point toward their having been planned and formed by a Divine Being, who used principles which are not functioning today. Such observations have been mentioned so often in this *Quarterly* that it is not necessary to repeat them. But, if a biologist is a confirmed materialist, he rules out such data as impossible. He limits his consideration to the findings of his own group.

The trend in education is toward specialization, and has been so for a number of years, I am not opposed to it except when one narrows his outlook and belief to the point where he excludes relevant data. Then specialization becomes serious error.

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REPORT BY THE EDITOR:

WHY BOB JONES UNIVERSITY IS NOT ACCREDITED

Attention has been called to the fact that Bob Jones University, Greenville, South Carolina 29614, is not accredited. In reply to my letter to President Robert Jones (son of the founder), he sent a brochure which included a very candid statement on this situation. He gave me permission to quote the following pertinent paragraphs:

After the University was well established, we checked very carefully all the standards of the Southern Association of Colleges and Secondary Schools to see whether it would be possible for our institution to hold organic membership in this Association without sacrificing any of our administrative policies which set us apart for the special task to which we felt God had called us. After careful consideration and much thought, and after advising with our scholarly, educational friends who had helped us in setting up our standards in the beginning, we were convinced that Bob

Jones University should not ask for membership in the Southern Association.

We have things in the administrative policies of our university that, as far as we can observe, no other institution has. These things are essential to the success of the school and the carrying out of the purposes for which the institution was founded. We sincerely believe that we can render better service spiritually and even educationally without holding organic membership in an association. When the Southern Association was founded, there was no Bob Jones University and no other educational institution within the bounds of the territory covered by the Association which had exactly the same religious and administrative slant that our institution has; so, naturally, when the Association set up its standards for admission, the administrative policies of an institution that was not then in existence could not be taken into consideration.

Every educator who knows the kind of plant and equipment and efficient business methods, the academic standards, and the achievements of Bob Jones University knows that this institution could qualify for membership in the Southern Association of Colleges and Secondary Schools. We wish to make it emphatically clear that the only reason we do not apply for membership in the Southern Association is that we do not wish to take any chance of having our administrative policies controlled or even **influenced** by any educational association or any group anywhere in the world. My son, Dr. Bob Jones, Jr., is president of the University. He has literally grown up with the institution and is responsible for most of the cultural and much of the spiritual emphasis of the school. He has associated with him a group of active young executives who not only have been trained in Bob Jones University but also have received additional training in a number of leading universities in America. My son and these executives have a better understanding of what is necessary in our administrative approach to our special problems than any group of individuals or organization could possibly have.

For example, we feel it is essential to maintain a unanimity of doctrinal position and purpose and a truly fundamental, Biblical approach to Christianity in our faculty, not only in doctrinal beliefs but also in the Christian application of these beliefs toward life. This is impossible unless the Administration, which understands the over-all aims and goals of the University, maintains control over its faculty without being subjected to pressures of committees or individuals who are not born-again Christians or who may fail to understand the unique emphasis and goals of Bob Jones University. We believe that only born-again Christians should set the policies for a Christian school; and we feel that we should be free to carry on the program of the University as God leads us without any outside agency, governmental or private, attempting to dictate the manner in which this program is carried out.

We believe that teachers should have full academic freedom within the stated purposes of the University. We also believe that the University should have freedom under the Constitution of the United States to carry out its purposes without outside interference and without being discriminated against because of our desire for freedom from control.

The fallacies of accreditation are well known to educators. For example, any official listing of regionally accredited schools includes almost every school within the boundaries of

the association and makes no distinction between those colleges which are barely meeting the minimum requirements and those which are outstanding in their educational accomplishments. Also, when a college becomes regionally accredited, not only are the credits of its present students recognized but also the credits of its past graduates are given full recognition, even though the school was not accredited when they were in attendance. It is evident from just these two facts that regional accreditation has little or no real value in determining a specific institution's standards.

Bob Jones University is known as the "World's Most Unusual University." In setting up requirements based on practices and standards of other schools and forcing colleges to bring their practices into conformity, the regional association tends to destroy the individuality of its member schools. While they profess to encourage experimentation, those experiments must meet the association's approval if they differ from the usual pattern. We do not want to sacrifice the unique approach of this institution to the confining restrictions of membership in a regional association.

Although the latest revision of the Standards for Colleges of the Southern Association does not contain this paragraph, earlier editions of these standards stated: "If adequate information were obtainable in regard to the attitudes and achievements of those who have attended an institution, it would serve as a sufficient single standard for accrediting."

This simply says that if you can show that you have delivered the goods, you had the goods to deliver. Bob Jones University would be glad to join any educational association on the basis of its academic achievements and the results which it has accomplished and is accomplishing, with the understanding that the membership of the institution would cease if at any time it did not continue to produce the academic and other results which it has produced and is producing. It is our opinion that under our system of government the only way any educational institution should be judged or accredited is by the results the institution produces.

The educator and the American public have the right to ask the question, "Is higher education producing?"; and every college or university should be able to adequately demonstrate the answer to this question. Bob Jones University, through the years, in the various areas of its emphasis, has been achieving outstanding results as judged by its accomplishments in various fields. For example, in our School

of Education, all of our graduating seniors take the National Teacher Examinations which are prepared and administered on a nationwide basis. For the last 16 years, the average score of our students has been above the national average. The same fact is true of our grades on the Advanced Test in Education of the Graduate Record Examinations, which is one of the main criteria for admission into graduate school. Over 1500 of our graduates have been certified and have taught in 42 of the 50 states of the Union.

The accounting majors in our School of Business Administration take the nationally administered American Institute of Public Accountants Examination their senior year. Every year their average score has been above the national average.

In our School of Fine Arts, the Division of Cinema was rated by the Society of Motion Picture and Television Engineers as one of the three leading schools in the country offering motion-picture training. The productions of "Unusual Films" have won numerous national and international honors.

In art and in music, our students have won top honors in state and regional competitions. Authorities have acclaimed our Shakespearean and opera productions as outstanding.

These examples are illustrative of the high standards maintained in the total University program, and our record is our assurance to other universities and to the public that we are producing quality results.

I know the American people. I am personally acquainted with many of the presidents and the deans of American universities and colleges. In America as long as an institution delivers the goods, the fair-minded executives of our American educational institutions will continue to do what they have done in the past, and that is to accept Bob Jones University graduates into their graduate schools and also our undergraduate credits when they are transferred to be applied to similar courses.

Because of our special spiritual and cultural emphasis, a number of young people make financial sacrifices and travel many miles to attend Bob Jones University because they want its special Christian philosophy and cultural approach to life's problems. Some of these students find it financially impossible to finish their work in the University. Some of them, of course, are interested in some major which our institution may not offer. Such stu-

dents transfer to undergraduate schools near their homes and finish their college work. We have kept up with most of these undergraduate students, and they have done good work in the undergraduate school to which they have transferred.

We wish to assure the presidents and deans of universities and colleges everywhere that any young person who makes a satisfactory academic record in Bob Jones University can make a satisfactory academic record in any educational institution. For a number of years Bob Jones University graduating seniors have taken the Graduate Record Examinations, and we do not recommend any of our graduates to graduate schools unless they make satisfactory scores on these Examinations. A few graduate schools, however, have accepted some of our graduates whom we did not officially recommend, and even these graduates have made good records. Each year approximately one-third of our graduates enter graduate schools throughout the country.

Bob Jones University meets all the academic requirements for teacher training in the state of South Carolina and will continue to do so. **But under no circumstances will Bob Jones University sacrifice any administrative policy which it considers necessary to the success and achievement of the purpose for which this Christian educational institution was founded.** The administrative policies of the institution are based upon what we sincerely believe as a spiritual and Christian approach to all the problems, including the academic problems, of Bob Jones University.

I very much admire the forthright statements made, especially the one: "the University should have freedom under the Constitution of the United States to carry out its purposes without outside interference and without being discriminated against because of our desire for freedom from control," In far too many schools "academic freedom" really means freedom to teach agnostic and even atheistic points of view.

It is very doubtful if a young assistant professor of any of the natural sciences, who pointed out consistently the many evidences for God's design in nature, or the fallacies in the evolution theory, would progress very rapidly in most public institutions. The value therefore of our privately maintained creation-oriented Christian colleges can hardly be overestimated.

Walter E. Lammerts
Editor

ARTICLE REVIEW

WILLIAM J. TINKLE*

"An Overlooked 18th Century Contribution to Plant Breeding and Plant Selection," by Conway Zirkle. *Journal of Heredity*, Vol. 59, No. 3, May-June, 1968, pp. 195-198,

We usually think of the science of genetics as beginning with the work of Gregor Mendel which became known to the world in 1900. Occasionally however we find a record which reminds us that much was understood before that time, not only in practical improvement, but also in interpreting the processes involved. This article by Professor Zirkle of the University of Pennsylvania contains an example of just such a record.

The *Journal of Heredity* has rendered a service by reprinting, as a part of this article, a forgotten paper written in 1799 by Joseph Cooper, an observant farmer in New Jersey. The author of the reprinted paper maintained that the custom then in vogue, of securing seed from a distance every few years, was actually not necessary. Instead of resulting in degeneration, a strain of plants can be improved by proper seed selection. Mr. Cooper supports his statement by his own experience in gradually improving squash, peas, asparagus, potatoes, and radishes over a long series of years.

Early Example of Selection

He relates an incident of making watermelons ripen earlier. A friend in Georgia sent him seed of a desirable variety and since that state has a long growing season, only a few melons ripened in New Jersey. Saving seeds from these melons and from the earliest ones in succeeding years, Mr. Cooper induced the melons to ripen appreciably earlier. We now understand that such a change does not involve a change in any gene but only a sorting of genes which changes the average. The genes for early ripening are sorted out.

A half century later we find Charles Darwin intrigued by similar data of plant improvement. He did not stop with practical results, however, but made an enormous extrapolation. Darwin

said that, given enough time, selection by man or by nature would change a very small, simple plant into a large and very complex species.

At that time no one knew the nature of genes nor their location in chromosomes. And while chromosomes had been seen, no one knew their importance as the bearers of genes. Yet the most significant fact is that, in the time of Darwin, breeding experiments had not been carried far enough to reveal that there are definite limits beyond which seed selection makes no difference.

In view of the paucity of research in the eighteenth century, the following insight by Cooper is truly remarkable.

What induced me to make experiments on the subject, was my observing that all kinds of vegetables were continually varying in their growth, quality, production and time of maturity. This led me to believe that the great author of nature, has so constructed that wonderful machine, if I may be allowed the expression, as to incline every kind of soil and climate to naturalize all kinds of vegetables, that it will produce at any rate, the better to suit them, if the agriculturists will do their part in selecting the proper seed.

Variability Is "Built-in"

This interpretation is quite in accord with the views expressed by the present reviewer and other members of the Creation Research Society. Fluctuations of plants and animals are not to be denied, for they are useful in nature. In ordinary plants and animals there are more genes than can be expressed in the development of traits.

Thus the plant or animal potentially is variable, the result depending upon which genes are expressed. For instance, in the watermelon, in a short growing season the vines having genes for early maturity are the ones which ripen seed and survive in future generations. For different types of soil and climate there are plants which have genes that will enable the plant to grow in different physical surroundings. It is reasonable to conclude, just as Cooper did, that such built-in variability was installed by the Creator.

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BOOK REVIEW

GEORGE BEDIGIAN*

God, the Atom, and the Universe, by James Reid. Grand Rapids, Mich.; Zondervan Publishing House, 240 pp., 1968, \$4.95.

This book contains views of a Christian engineer about space physics study of creation and science. He has many novel insights on how Bible language fits the framework of current scientific concepts, and indeed any new discoveries yet to come, and even is suggestive of productive fields for future research. He is a member of the American Scientific Affiliation, which he mentions several times, but regrettably not one reference is made to the Creation Research Society.

The impressive aspects of the book are its emphasis on plasma as the fourth state of matter, and emphasis on time as the fourth dimension of space.

Fourth State of Matter

Plasma is the unassociated mixture of unattached electrons and other particles not formed into atoms; in some respects, as in flowing they resemble liquids and gases; in other respects they are highly sensitive to electrical and magnetic forces, p. 114ff. "Deep" and "waters" of Gen. 1:2 could mean the plasma, p. 102, 116; "Spirit . . . moved" could be the various forces concentrating the plasma, p. 102; "firmament," Gen. 1:6, would be the space separating the galaxies (plasma concentrations), p. 121. "Light," Gen. 1:3, was the highly ionized stage of the plasma, p. 117; but in meantime the Big Bang, p. 98, scattered the concentrated plasma, and thus the "darkness" of Gen. 1:4 appeared, p. 117. Earth was created from smaller plasma mass before sun, p. 125ff; so earth, sun, and moon quite possibly were not formed from each other, p. 151.

Fourth Dimension of Space

His concepts on time as the fourth dimension, p. 59, is the most startling idea in the book. He accepts relativistic science in certain circumstances, p. 60. As speed approaches that of light, time slows, till at speed of light it stands still, p. 67; it is even conceivable that time may go backward, p. 66. So in the sense of variable speed, Bible verses take on new or added meaning; such as, when Christ is "unapproachable light," "the same yesterday and today and for ever," p. 69, (I Tim. 6:16; Heb. 13:8).

Many other novel insights appear in this book. Some relatively minor points discussed are: (1) The Tower of Babel was built for publicity,

and "to make a name," p. 40. (2) He accepts life likely elsewhere than on this planet, p. 44; but on p. 211 talks of the "odds" against such likelihood. (3) Since atoms do not reproduce themselves, they could not possibly come about by chance, p. 59. (4) Every time scientists "expand" the size of the universe, our image of an infinite God must necessarily grow, in the sense that "infinite" must be bigger than any known object, p. 75. (5) Matter is mostly space, in the ratio of a trillion to one, its "solidity" being due to electron activity, p. 84. (6) Christ himself indicated that the earth was round, promising to return when it was both day and night, p. 47 (Luke 17:31, 34). (7) Man needs five billion items in order to live; therefore, man could not have originated by chance, p. 179.

Accepts Evolution as Creative

One controversial concept in the book is his acceptance of evolution as a possible way of creation, p. 192. On p. 190 he regrets that current evolution is anti-biblical. He also maintains that those who accept creation are arguing for a form of spontaneous generation. He defines theistic evolution as that guided by God who then intervened to make man in His image, p. 207.

Reid maintains that there are so many facts known today that most anti-evolutionary books appeared before the 1960's (!). "One has to blind his eyes to a good deal of progress in order to attempt a denial of (evolution) as a possible way of creation," p. 192, is the way he expresses himself. Also, he lists eleven differences between the accounts of creation in Genesis 1 and 2 before attempting reconciliation, p. 203; again his manner is novel, and the reader has to decide whether he has met those "differences."

General Comments

Tower of Babel: If it was an astrological structure, as some say, then it was not built for publicity, but to help practitioners of astrology determine, from heavenly observation, what names to give people!

Life elsewhere: This is not a matter of "odds," but design. Isaiah 45:18 says that the earth was created "to be inhabited." I do not understand why we are looking for life thousands of light years distant, if we are correct in understanding human life originated only a few millenia ago.

Earth round: Another verse often mentioned, Job 26:7, the earth is hung on nothing.

Theistic evolution: This seems a self-contradiction; if the new life forms did not make themselves, then why not give" credit where due? Is

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the God who sees each sparrow fall and knows the number of our hairs, too busy to likewise take care of everything else? Matt. 10:29, 30.

Time variable: a) This he uses to account for creation "day," without one reference to "evening and morning." If earth history is really long, one possible explanation is that it refers to covering and uncovering of the land by the sea in conjunction with the processes of mountain formation. b) This time variable is really a

"blockbuster" from our view; consider: If the Big Bang is right, then at what speed? If at the speed of light so that time stood still, then all the seeming billions of years apparent to geologists could be telescoped into the days of Genesis. c) And what of the future? If God is light, I John 1:5, then He is timeless (p. 67, Reid); and since in the new Heaven He is the light, Rev. 21:23, then "there should be time no longer" (time shall be no more!) Rev. 10:6.

INTERESTING PUBLICATION

Doorway Paper No. 29, "A Framework of History," by Dr. Arthur C. Custance. Ottawa, Canada: Box 1283, Station B. 1968, 154 pp., \$3.00, post free.

The thesis of this Paper is simple enough in its conception but it is based on certain bold assumptions which are likely to be challenged on the one hand by those who do not accept the Christian position and on the other by those who do—for quite different reasons.

The first probably unacceptable premise is that Man is not incidental to the Universe but the very reason for its being called into existence. The second is that the nature of the Universe was predetermined by a decision which God made to create Man in such a way that he would not only need redemption but could be redeemed. This redemption involved the entry of God Himself, incarnate as Man, into this time-space world for a season. And man, therefore, must be such a creature that God could appropriately express Himself in human form. The Universe was, from the very beginning, pregnant with MAN.

A world had to be designed, therefore, in which physical death would have a special significance for a creature with a reasoning mind. Physical death, because it was by means of death that redemption was to be brought about: and reasoning mind, because it was by the exercise of intelligent faith that that death was to be made effective. The object of this divine planning was that God might show forth that aspect of His being which the angels appear not to have comprehended, namely, His love—without at

the same time surrendering that part of His nature which they do comprehend, namely, His holiness.

The Earth was appointed as the setting and its peculiar fitness derives from its position within the solar system and this solar system may in turn very well depend upon its galaxy, and this galaxy upon the existence of the Universe. The physical Universe is thus the essential framework within which the Plan of Redemption is being worked out. Moreover, so long as Man exists in the need of redemption certain historical processes have been providentially appointed which preserve him in the meantime from completely destroying himself because of his sinful nature.

This is by far the largest Paper in the series and in a sense ties together the great majority of them into a single "one man's Christian philosophy." There are some difficult places for proper expression of the author's thoughts but by and large the end result illustrates, in the light of modern knowledge, a beautifully comprehensive observation made by Victor St. Hugo: "The world was created for man's body, man's body for the spirit, and man's spirit for God: the spirit that it might be brought into subjection unto God, the body unto the spirit, and the world unto the body." In short, Man is, the author firmly believes, the **key** to the meaning of the Universe.

The Paper, which contains unique framework of History, is documented from some 300 sources.

Though Dr. Custance accepts the geological "column" and presumed millions of years for its formation, there is much in this fine paper of value to creationists.

LETTER TO THE EDITOR

In lively fashion in his book, *The Biblical Flood and the Ice Epoch* (Pacific Meridian Publishing Co., Seattle, Washington 98103) Donald Wesley Patten helps one picture possible mechanisms and results of a world-wide tidal flood brought on, physically speaking, by a pass of another astronomical body close to the earth. Patten makes liberal use of charts, tables, line drawings and diagrams.

There are many things wrong with this book. Patten is well aware that his own theory runs sharply counter to the theory of uniformitarianism on which Darwin and the Darwinians have so heavily depended. Not content with expounding his own theory thoroughly, Patten sets out to demolish the theories of the opposition. Even readers who are happy to see Darwinian get some of the treatment they have so cheerfully ladled out to others for a hundred years may turn a bit squeamish at the "meat-ax" approach Patten uses on his foes.

Another problem from my point of view is the antediluvian canopy theory. This is not new with Patten, of course, but he has his own special reasons for embracing it in line with his structural theory. Frankly, it will take a writer far more persuasive than Patten to convince me that for sixteen hundred years, man went without seeing either sun, moon, planets or stars under a perpetually vaporous and cloudy canopy. A carbon-dioxide canopy would very likely meet all the requirements of the situation in a much more esthetically satisfactory manner.

Although Patten is a staunch believer in the Bible as the Word of God, and certainly one of the best informed opponents Darwinism has had in some time, he displays much of the reluctance of most moderns in accepting a simple six-day creation as taught in Genesis. Creation is not really his subject, in this book, but it is a bone he throws out and one I find necessary to pick.

Further, the book is expensively produced and sells for \$7.50, and being a poor man I find this

hard to take. My students blanch at a price like this and my sympathies are all with them.

Airing all these gripes encourages me to believe that I am doing my duty, holding up the side, as it were, and manifesting the wisdom, candor and Christian charity which are customarily displayed by the erudite.

Having gotten all that behind us, let me speak more frankly and simply say that Patten's book, for all its defects, is one of the four or five most thought-generating books I have come across in my lifetime. I can only say gratefully, "Praise the Lord" for such a man and such a book. This book opens a whole new dimension in the study of the Scriptures.

I have been depressed by the vast number of even so-called "evangelical" ministers who have refused to preach upon such things as Noah's flood for fear of displeasing "science" so called. Patten's book will give courage to many to renew their studies and interest in the flood and other "hard" questions of the Bible.

Patten's book has come at the right time. We could not have understood it a few years ago until we began sending astronauts into outer space and started facing realistically and pragmatically the forces that control our planet, the solar system and the galaxy.

In the past two or three years I have discovered an enormous hunger for clear teaching on Genesis among the college students and many Christians. I have found Patten a tremendous aid in making plain some of the great facts and implications of both Genesis and other portions of Scripture. If I have any influence on the situation, Patten will soon publish a paper back version of his book and bring its enlightenment to a far greater audience.

Signed,
TALMAGE WILSON
Assistant Professor
of Religion and Philosophy
Seattle Pacific College
Seattle, Washington 98119

INTERESTING PUBLICATION

Doorway Paper No. 51, "Cain's Wife and the Penalty of Incest," by Dr. Arthur C. Custance, Ottawa, Canada: Box 1283, Station B. 1967, 20 pp., 50¢, post free.

This Paper is not merely a study of an old issue which has formed the butt of many cynical queries. It is a study of one aspect of Scripture which serves to show how beautifully the Bible itself supplies the answers to its own problems provided that it is wholly believed. Insoluble difficulties arise for the Christian student of

Scripture if he once begins to pick and choose what he will believe and what he will reject. But if the record is studied with equal confidence in all its parts, none excepted, it is amazing how problems dissolve. This Paper is a good illustration of that principle, and all important statements are documented fully.

Succinctly stated, Dr. Custance argues that since mankind of Genesis was still free of harmful mutations, brother and sister marriage was not harmful.

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