

Creation Research Society Quarterly

Haec credimus:

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

VOLUME 18

DECEMBER, 1981

NUMBER 3



CREATION RESEARCH SOCIETY QUARTERLY

Copyright 1981 © by Creation Research Society

VOLUME 18

DECEMBER, 1981

NUMBER 3

EDITORIAL BOARD

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

Walter E. Lammerts, Research Editor

Thomas G. Barnes University of Texas at El Paso, Texas

Duane T. Gish Institute for Creation Research,
San Diego, Calif.

George F. Howe Los Angeles Baptist College,
Newhall, Calif.

John W. Klotz Concordia Seminary, St. Louis, MO.

John N. Moore Michigan State University
East Lansing, Michigan

Henry M. Morris Institute for Creation Research,
San Diego, Calif.

William J. Tinkle Anderson College (retired)
North Manchester, Indiana

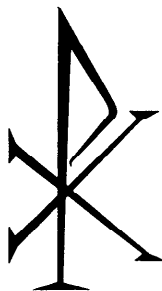
John C. Whitcomb Grace Theological Seminary,
Winona Lake, Ind.

Emmett Williams Continental Telephone Laboratories,
Norcross, Georgia

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

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

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



CORRECTION

In "Asa Gray Vindicated", p. 74 of the *Quarterly* for
June, 1981, the quotation should be from p. 298 of
Origin, 1927, D. Appleton and Co.

In the same issue, p. 10, in "The Episteme is the
Theory", quotation no. 11 is from W. R. Thompson,
Science and Common Sense, Longmans, p. 229.

COVER ILLUSTRATION

The picture on the front cover of this issue of the
Quarterly is of a koala, and was drawn by Kelly J. Mar-
tin, who is a science major at Northeastern Oklahoma
State University.

The koala has a number of unusual features; and it is
very difficult to see how they could have evolved, little
by little. It is much more satisfactory to believe that
God created these animals, ready to occupy the niche to
which He assigned them.

TABLE OF CONTENTS

	Page
The Koala— an Evolutionist's Dilemma Kelly J. Martin and E. Norbert Smith	139
Neanderthal, Oh How I Need You! Erich A. von Fange	140
Mechanical Design in the Human Body David A. Kaufmann	155
A Recent Creation Explanation of the 3° K Background Black Body Radiation Russell Akridge, Thomas Barnes and Harold S. Slusher	159
Intelligence Rather than Struggle William J. Tinkle	163
Have the Genesis Kinds Ever Crossed? Frank Lewis Marsh	164
Implications of Palaeolithic Stratigraphy for Creationist Models of Prehistory Ken Guenter	168
Speciation or Irruption: the Significance of the Darwin Finches G. H. Harper	171
Panorama of Science	176
Book Reviews (4)	176
Letters to the Editor (1)	180
Creation Research Society Laboratory Report John R. Meyer	181

Kelly J. Martin and E. Norbert Smith, in an article
elsewhere in this issue of the *Quarterly*, discuss some of
these features, and the impossibility that they could
have evolved.

THE KOALA—AN EVOLUTIONIST'S DILEMMA

KELLY J. MARTIN and E. NORBERT SMITH**

Received 24 September, 1980

If evolution from one major group to another has occurred, transitional organisms (or their remains) are absolutely necessary. Evolutionists are a believing group, are undaunted by the lack of evidence, and often fabricate unending hypothetical transitional animals. Such obligatory transitional ancestors have been accepted (by faith) and often appear in text books. We have all seen drawings of hypothetical (but necessary) transitory organisms leading from fish to amphibian, or from lizard to bird. Some of these appear a bit hard to accept; the ungulate to whale and the evolution of flight a myriad of times in insects for example. Yet these transitional types are essential to evolution. This is no small matter. Consider for example, the evolution of flight from non-flying ancestors. Not only must the appropriate anatomical structures be transformed into flight organs, but simultaneously, supporting physiological and behavioral adaptations must be changing to assume successful flight.

Most importantly, for any evolution, each transitional type must be at a selective advantage over ancestral types in order to compete with parental stock and avoid extinction. As an example, consider the koala.

Koala bears are Australian marsupials *Phascolarctos cinereus* that live nearly their entire life high in eucalyptus trees.¹ They grow to 9 Kg, and are currently protected by law from pelt hunters. An adult and young are shown on the front cover. As is the case of other marsupials, their young are born quite immature; and embryonic development continues in the female's pouch. Nursing occurs inside the pouch.

They survive without drinking water or shelter, and their diet consists mostly of toxic eucalyptus leaves. Periods of drought often result in the death of many Koalas due to the low nutritive value of their diet. Basal metabolism is only 3/4 of what would be expected from marsupials. They survive high temperatures by panting; and a well insulating coat protects them from cold.²

Certain structures of the Koala demand consideration. One "advance" of hominoids is said to have been the grasping hand (with an opposable thumb). Many apes, however, have advanced beyond man's opposable thumb and have not only a hand with an opposable thumb, but also a foot with an opposable great toe. Not to be outdone, the Koala not only has an opposable great toe on its foot, but two opposable digits on its hand. Intermediate ancestral Koalas no doubt had an intermediate opposable second digit that could go either way (or neither way). Wouldn't such versatility be more adaptive than present structure?

It is also interesting that the foot's first digit has no

claw while the second digit has two. It would be interesting to hear the evolutionists' argument for the adaptive significance of a single claw migrating for eons of time from the first to the second digit. It would be interesting to see what kind of support, if any, embryological studies would contribute. See the illustrations of both of these features in Reference 1.

Finally, the Koala is one of the few marsupials with a pouch that opens aft. (The wombat has the same feature.) Are Koalas ancestral to marsupials with pouches opening toward the head or vice versa? The successful birth of premature marsupial "embryos" require the orchestration of complex behavior patterns of mother and offspring. Most marsupials lick a path for the young to scurry from the vagina to the pouch. What kind of intermediate pouches existed? Might they have opened at both ends? That would seem a bit drafty and insecure for larger young. Perhaps they opened on all sides with columnar support at four corners.

In brief, Koalas are quite interesting, and appear well adapted for their particular niche. To obtain their various unique structures from ancestral types, each intermediate stage being fully functional and better adapted than its ancestral form, stretches the imagination beyond limit. It is more rational to agree with the apostle Paul, "But as it is, God has placed and arranged the limbs and organs in the body, each particular one of them, just as He wished and saw fit and with the best adaptation" (1 Cor. 12:18 Amplified).

References

- ¹Degabrielle, R., 1980. The physiology of the koala. *Scientific American* 243 (1): 110-117.
- ²Degabrielle, R., and T. J. Dawson, 1979. Metabolism and heat balance in an arboreal marsupial, the koala (*Phascolarctos cubereys*). *Journal of Comparative Physiology* 134: 293-301.

PLACEMENT SERVICE

Do you know of academic vacancies to which Creationists might be directed? The Creation Research Society would like to be in a position to be able to inform Creationist scientists of such vacancies. If you know of such positions, will you please inform Dr. John W. Klotz, 5 Seminary Terrace North, St. Louis, Missouri 63105, describing the position, and the academic requirements and training required, and giving any other information which might be available? You will be helping students whose views you share.

Graduate students who are interested in placement may write to Dr. Klotz for information about any available positions which are known to the C.R.S.

*Kelly J. Martin is a science major at Northeastern Oklahoma State University, Tahlequah, Oklahoma 74464.

**E. Norbert Smith, Ph.D., is Assistant Professor of Biology at Northeastern Oklahoma State University.

NEANDERTHAL, OH HOW I NEED YOU!

ERICH A. VON FANGE*

Received 4 December, 1980

For a century or more, and despite some voices raised to the contrary, Neanderthal man was touted as a bestial missing link, and that view was used to support the theory of evolution.

More recently it has become apparent that Neanderthal was a true human, not so very much different from modern man, and that fact is generally admitted, albeit sometimes reluctantly.

Plan of this Article

- I. The Finds.
- II. The Triumph for Evolution.
- III. Troubling Signs of Neanderthal Sophistication.
- IV. The Scandal of the Neanderthal Brain.
- V. A Slight Case of Honesty—Upgrading Begins.
- VI. A Matter of Sequence.
- VII. Could Neanderthal Have Been “Recent”?
- VIII. A Bit of Scholarly Backlash and More Confusion.

I. The Finds

The American Heritage Dictionary of the English Language (1969) defines Neanderthal man as “an extinct species or race of man, *Homo neanderthalensis*, living during the late Pleistocene age in the Old World, and associated with Middle Paleolithic tools.” The illustration in the dictionary is the famous reconstruction by M. Boule (1908) showing a less-than-human creature.¹

Joachim Neander (1650-1680), the foremost hymn-writer of the German Reformed Church, unknowingly gave his name to Neanderthal man. A century before his birth, the family name was changed according to the fashion of the time from Neumann to the Greek form of Neander. Thal means valley. Neanderthal is a ravine near the village of Hochdal between Dusseldorf and Elberfeld, Rhenish Prussia. Through this limestone gorge flows the Dussel River. Neander’s great love of nature often led him to the ravine where he is said to have composed many of his hymns. After a time the beautiful valley became known after his name. Almost two centuries after his death, workmen quarrying in the valley uncovered the skeleton of the so-called Neanderthal man who had been buried in a cave there.²

The discovery was made in a Quaternary bed in the Feldhofen Cave. Although much was lost in the crude recovery attempt, the bones found included a brain-cap, two femurs, two humeri, and other fragments. The find is preserved in the Fuhlrott Collection, Elberfeld. Johann Karl Fuhlrott, a local teacher, recovered the bones in August 1856, and the Neanderthal skull was first brought to the attention of a scientific body by Prof. D. Schaafhausen in a report read to a meeting of the Lower Rhine Medical and Natural History Society at Bonn on February 4, 1857. In his careful anatomical description of the Neanderthal find, he concluded that despite some interesting characteristics, Neanderthal man must be considered human and normal.³

The discovery thirty years later of two other skulls, almost identical in form, at Spy in Belgium, helped to show its typical character. As time went on other Neanderthal remains were recovered in China, Central and North Africa, Iraq, Czechoslovakia, Hungary, Greece, and in northwestern Europe. An earlier find (1848) at Gibraltar was also recognized later as a Neanderthal specimen.

In 1908 another Neanderthal burial was found near the village of Le Moustier in southwestern France. This is the same village which gave its name to the tools associated with the Neanderthals. In the same year the remains often called the classic Neanderthal skeleton were found near the village of La Chapelle-aux-Saints.⁵

Various techniques and assumptions were used to fit Neanderthal man into a time scale. Pearce placed the first indications of Neanderthal at 150,000* years ago. Other sources give different estimates, but they are all in general agreement. He was believed to have become extinct 80,000 years ago according to Weckler (1957); 50,000 years ago according to Hurley (1959); 45,000 years ago according to Brodrich (1964); 40,000 years ago if we accept Pearce (1969); or 35,000 years ago according to Claiborne (1974). It is undoubtedly a coincidence that Neanderthal man becomes 5000 or more years younger at five-year intervals. Was Kluckhohn (1944) ahead of his time when he dated the extinction of Neanderthal man at only 25,000 years ago? Further, he held that modern types of man “gradually exterminated them, possibly absorbing them to some degree.” “Gradual extermination” and “absorption to some degree” are interesting concepts. Claiborne held that Neanderthal was the only variety of man on earth for thousands of years.⁶

Shanidar cave in Iraq represents a very important Neanderthal site. It is also a good example of how the scientific dating process was carried out. The oldest remains in the cave are Neanderthal men. Seven adults

*Erich A. van Fange, Ph.D., lives at 460 Pine Brae Drive, Ann Arbor, Michigan 48105.

*Conventional dates are used throughout this paper, generally without comment. The author’s position regarding these dates will become clear later in the paper.

and a child were found in deposits of five meters or about 16 feet thick. The deposit is said to have been laid down over a period of about 100,000 years, and this was determined by C14 tests. For example, a sample from the second stratum gave a reading of about 12,000 years; layer C was about 29,000 years old. Deeper in the C layer the date of 34,000 years was derived. It was then acknowledged that the C14 method can become very untrustworthy if continued too far. The lowest part of the C stratum was then estimated to be around 44,000 years old. The child's skull, still lower in the deposit, was estimated to be about 70,000 years old. The conclusion was that Shanidar cave was inhabited by Neanderthal man for about 60,000 years.⁷

In connection with the above comment on C14 dating problems if continued too far, Hurley observed that the problem occurs at around 20,000 years. He states that without special development work (no explanation given), it is not generally practicable to measure ages in excess of about 20,000 years, because the radioactivity of the carbon becomes so slight that it is difficult to get an accurate measurement above background radioactivity.⁸

Brace illustrates the tortuous path of dating, even today, of the remains of the past. The reader must attempt to judge where science leaves off and humbug begins. Speaking in all seriousness of Neanderthaloids (creatures supposedly half way between Neanderthals and modern man) found at Krapina in Croatia, Yugoslavia, Brace states: They were formerly considered third interglacial but recent stratigraphic work has equated them with an interstadial (amelioration) within the Wurm glaciation, making their age about equivalent to the Skhul Neanderthaloids.⁹ One must admit that it is hard to argue against a statement like that.

II. The Triumph for Evolution

In the early years after the appearance of Darwin's doctrine, his followers were determined to support it by evidence of more ancient and more primitive forms of man. The opponents of the principle of evolution were equally determined to discredit any such evidence.

The appearance of the Neanderthal specimen gave both sides the opportunity for which they had been waiting. For one thing they could now shift the argument from the relatively static and dull realm of the lower animals to the stage of man himself. The controversy over the real nature of the skull raged through the pages of the scientific journals and on the rostrums of the scientific meetings for many years.

The supporters of Darwin argued that the remains represented a normal (but ape-like) species. Opponents of Darwin argued that the remains were of a diseased human.

Marcellin Boule of the National Museum of Natural History in Paris was the early twentieth century's foremost authority on fossils, and he traveled the world to study new finds. His prize pupil was Teilhard de Chardin.¹⁰ It was Boule who did more to shape twentieth century thinking about Neanderthal man than anyone else. He devoted years of study to the "classical" Neanderthal skeleton from La Chapelle-aux-Saints.

Between 1908 and 1913 Boule issued a series of scholarly papers on Neanderthal man climaxed by a massive monograph in three parts.¹¹

In his report made before the French Academy of Sciences on 14 December, 1908, Boule included the following characterizations: It strikes us with its bestial appearance, or, to put it better, by the general collection of simian (ape) or pithecoïd (monkey) characteristics. The Neanderthal group represents an inferior type of being closer to the apes than to any other human group. He concluded also that Neanderthal was very primitive from an intellectual point of view. Elsewhere in his report, Boule commented on the slumped posture of Neanderthal man, the supposed monkeylike arrangement of certain spinal vertebrae, and he even suggested that the feet may have been grasping organs like the feet of gorillas and chimpanzees. As recently as 1957, the Boule study was cited as a major source of information about the nature of Neanderthal man. This is unusual durability for a report in the area of fossil man.¹²

Since Boule's reconstruction had such an overwhelming influence throughout the world, further details must be noted. The reconstruction was very ape-like, and clearly showed the following characteristics not already noted above: Regarding the foot bones, the big toe diverged from the other toes like an opposable thumb. This feature presumably forced the Neanderthal man to walk on the outer part of his foot, like an ape.

Another key point was the knee joint. Boule concluded that the Neanderthal could not fully extend his leg, and that this resulted in a bent-knee gait. Further, the spine lacked the curves that allow modern man to stand upright. The head was thrust forward so far that Neanderthal man probably could not look skyward. He could well be described as a shuffling hunchback. But the most devastating conclusion of the study focused on the intelligence of the man from La Chapelle-aux-Saints. Looking at the long, low skull, Boule perceived severe mental retardation. In brainpower Boule ranked Neanderthal man somewhere between apes and modern man—but closer to the apes.¹³

As indicated above, the European Neanderthals were believed to be incapable of walking erect because their foramen magnum, the hole at the base of the spine through which the spinal cord passes, was slanted rearward.¹⁴

The foot, according to Boule, was a prehensile organ. The neck vertebrae resembled the chimpanzee, and the pelvis was apelike.¹⁵

From the time of Boule down to the present, anthropology and countless other texts and printed materials depicted Neanderthals with the slumped, bent-knee posture that Boule had postulated. Museums feature Neanderthal exhibits which faithfully depicted the Boule reconstruction.¹⁶

William King, anatomist at Queen's University, Ireland, coined the name, *Homo neanderthalensis*. He first held that Neanderthal was human, but later changed his mind and held that Neanderthal was generically distinct from man, that is, more animal than man.¹⁷

In 1913 Gustav Schwalbe published a lengthy review of Boule's work and formally adopted Boule's position

that the Neanderthals were the direct ancestors of modern man.¹⁸

In the 1920's, Elliot Smith, noted anthropologist at University College, London, wrote about uncouth and repellent Neanderthal man whose nose was not sharply separated from the face, the two being merged in what in another animal would be called a snout. Furthermore, Neanderthal man probably had a shaggy covering of hair over most of the body. Smith also claimed that the Neanderthal hand lacked the delicacy and nicely balanced cooperation of thumb and fingers, which is regarded as one of the most distinctive human characteristics.¹⁹

Evolutionists believed they had good reasons to attempt to equate fossils with living primates in the 19th century. Strong support for this came from the Neanderthal jaw found at La Naulette in eastern Belgium in 1866. Darwin quoted the evidence to show that this Neanderthal jaw was supposed to have possessed enormous projecting canines. After the La Naulette discovery Neanderthal man was given many gorilla-like characteristics, and the tribe was described as appearing in the highest degree hideous and ferocious.²⁰

In the 1940's, the noted British historian, Gordon Childe, stated that some very early 'men' indeed had projecting canine teeth set in very massive jaws that would be quite dangerous weapons, but these have disappeared in modern man. While Childe here was describing Piltdown man, his opinion of Neanderthal was similar in the following description: Neanderthals were a curious race in Europe perhaps specifically distinct from *Homo sapiens*. They had a huge bony vizer above the eyes instead of two eyebrow ridges, the forehead is retreating, the jowl enormous and the chin lacking. The head was so balanced on the spine that it hung forward. The structure of the legs and feet permitted only a shuffling gait. Childe doubted that Neanderthal blood runs in the veins of Europeans or any other modern races.²¹

Various scientists reported further information about Neanderthal man in the 1950's.

Berrill observed in 1955 that the Neanderthal people were uncouth to say the least, and they may even have sported a hairy coat like the mammoth and rhinoceros which they hunted.²²

In the *Scientific American* in 1957, Weckler sums up a century of study and speculation about the Neanderthal man, and his description includes familiar elements: the skeleton is stooped. So-called classical Neanderthal man had a long, low-vaulted skull, a big, jutting, muzzle-like mouth and a retreating chin. He had a squat body with a barrel chest, bowed legs and flat feet, suggesting that he walked in a crouch with bent knees and a shuffling gait.²³

Also in 1957 the scientist, Le Gros Clark, concluded that Neanderthal man had a distinctly simian (ape-like) appearance, basing his view on the enormous development of brow ridges, the receding forehead, and the flatness of the skull roof. Considering all known Neanderthal remains, Le Gros Clark concluded that Neanderthal man must in life have had a distinctly brutish appearance, with a thickset body and limbs of

ungainly proportions. He evidently walked in a rather stooping posture and with a lumbering gait. From an anatomical point of view, Neanderthal was much more ape-like than he was like *Homo sapiens*. The brain showed certain features of primitive appearance. At this point in time, he placed Neanderthal man into an aberrant side-line of evolution.²⁴

In 1958 Weiner observed that the simple evolutionary series of Java man—Neanderthal man—modern man, established first just fifty years ago, was in itself a powerful validation of Darwin's views on human evolution.²⁵

One further comment from the 1950's by Hurley was that "unsuccessful Neanderthal man lasted only about 2000 generations." He thus echoed the conclusion of Le Gros Clark that Neanderthal man became extinct, instead of serving as an ancestor of modern man.²⁶

In 1966 Pollard observed that Neanderthal man would really not be considered human if he were encountered today, and that his brain was small by our standards.²⁷ In the same decade, the late Louis Leakey, the world-famous paleoanthropologist, suggested that any marriage between Neanderthals and modern man might well have produced sterile offspring, like a mule born of a horse-donkey mating.²⁸

As recently as 1967, Brace included Neanderthal man as one of the major groups which formed the evolutionary stages through which it is claimed that man and his ancestors passed. He suggested the following sequence as a useful outline: The oldest were the two versions of Australopithecines in early Pleistocene times; next a cluster of Pithecanthropines in mid-Pleistocene times. In the upper Pleistocene immediately prior to the appearance of modern man, a fossil group we call the Neanderthals appeared.²⁹

Neanderthal man is still very much in the news in the 1970's, and further research and opinions are reported. There is some shift of emphasis to the soft parts of the body. Presumably the bones of the specimens had been exhaustively studied by this time.

In 1971 Kolosimo restates what has been said before: The discoveries of Neanderthal remains were a triumph for Darwin's theory. In the first years of the twentieth century scholars no longer argued whether Neanderthal man was a representative of primitive humanity. The only point in dispute was where exactly he belonged in the story of evolution. As one find succeeded another, scientists felt able to paint a broad picture of the series of transformations which, they believed, led from the deformed ape of remote prehistoric times (Neanderthal man) to the final appearance of *Homo sapiens*.³⁰

In the period of 1971 through 1975 considerable emphasis was made on a study of speech patterns of Neanderthal man made by Philip Lieberman, University of Connecticut, and Edmund Crelin, Yale. The scientists, the one a linguist, and the other an anatomist, modeled the talking apparatus of contemporary human adults, newborns, chimpanzees, and fossil hominids, including the classic Neanderthal from La Chapelle-aux-Saints in France. Reconstruction from the fossil skulls was based on anatomical clues such as the marks muscles leave on bones, and a computer helped determine the possible range of sounds that could have been

made by each type of vocal tract. It was concluded that classic Neanderthal man just did not have the equipment to produce the full range of sounds, particularly certain vowels, necessary for human speech, although other fossil hominids may have. Another conclusion was that chimpanzees have enough ability to produce enough sounds to develop a useful language of their own.³¹ One of the investigators stated that if Neanderthal man tried to talk to you, his language would probably sound like a series of ape-like inarticulate grunts and noises.³²

Soviet scientists such as Prof. Boris Porshnev and his colleagues, Dmitri Bayanov and Igor Bourtsec, believed that the term, Neanderthal man, was a misnomer. The creatures were not men but animals, since man begins where speech begins, according to their view. Both the body structure or morphology and the artifacts tend to show that Neanderthals (with perhaps just a few exceptions) had no speech and abstract thinking.³³ These comments are stated in a book published in 1975.

In 1972 Van der Veer comments on the remains of over a hundred Neanderthals which had been unearthed to date. These were primitive beings similar to man and we now have approximate dates of all the important states in man's descent. He finds it surprising that evolutionary doctrine is still found by some to be extremely difficult to accept. In his view all the evidence goes to show that man has clearly developed from a species of ape.³⁴

Francis Ivanhoe (1971) of Cartwright Gardens, London, discusses another aspect of early man. Early man was a tropical primate who began his existence with dark skin. The pigment in the skin protected him from overdoses of vitamin D and resulting kidney problems. When man moved out of his tropical homeland to Europe, where ultraviolet radiation from the sun tended to be more scarce, the dark skin became a liability. It filtered out so much of the vitamin D-producing radiation that Neanderthal man may also have suffered rickets; from some also suggested congenital syphilis. Evidence for this was observed in the bulging of Neanderthal's skull, the curvature of his long bones, and his saddle-shaped nose.³⁵

Van der Veer (1972) stated that Neanderthal men were offshoots of man which led nowhere, and the modern man could not have descended directly from Neanderthal man.³⁶

As of 1973 we learn that Soviet anthropologists such as Yakimov, Bonch-Osmolovsky, and Bounak accepted the walk of Neanderthals as construed by experts, that is, Boule, on the analysis of fossil material. There was less impact on the heels than is the case with modern humans, and the legs were slightly bent even in the standing position.³⁷

In June, 1974, Klein wrote about the anatomically primitive human subspecies we call Neanderthal man.³⁸

Claiborne (1974) notes that Neanderthals were clearly different from the modern man. Neanderthals resembled one another more than any of them did modern man, and modern man resembles one another more closely than they do any Neanderthals (except for a few finds in Palestine). He based his judgment on the fact that Neanderthal foreheads sloped back more than

ours do. Their eyesockets had heavy bone ridges. Chins were flat or sloped back. He summed up by saying that Neanderthal man could be a different species, but there is no proof that they are.³⁹

Brace sees no need to accept the view that Neanderthals and moderns lived at the same time in old Palestine. He notes that the Tabun skeleton showed a C14 date of 41,000 years and the Skhul materials were by projection some 5,000 years more recent. Thus the Skhul population, which is intermediate between Neanderthal and modern man, came at just the right time. This view eliminates all need, according to Brace, for theories involving hybridization of the two creatures with their attendant difficulties.⁴⁰

In the *Smithsonian* (1975) we learn that a British scholar found that the Neanderthals' thumbs were barely opposable, which implies that there was still less than human development.⁴¹

The case of the evolutionist for the place of Neanderthal man in the story of man seems solidly based and a powerful argument against creationism. It is not surprising that Neanderthal was used to settle many an argument for at least three generations on the evolutionary development of man.

An incident in 1957 illustrates perfectly what a powerful weapon Neanderthal man had become. One of the great intellectuals of the twentieth century is Dr. Mortimer J. Adler, best known for his development of the *Great Books of the Western World*. Dr. Adler once expressed the view that evolution was only a popular myth for which the evidence is insufficient and conflicting. Evolution, according to Adler, is only an elaborate conjectural history, which vastly exceeds the scientific evidence. This kind of talk aroused the ire of Martin Gardner, mathematician and author of *Fads and Fallacies in the Name of Science*. Of all the possibilities which Dr. Gardner must have considered for a response to Dr. Adler, it is interesting that he chooses only one weapon with which to devastate his opponent, and that is Neanderthal man. Gardner asked: "Where is one to place the dozens of well-preserved skeletons which have been found of Neanderthal man—a creature with a low forehead like an ape, a head that hung forward, no chin, and non-opposable thumbs?"⁴²

III. Troubling Signs of Neanderthal Sophistication

From the animal-like characteristics ascribed to Neanderthal man, especially in the early twentieth century, one would hardly expect to find any significant cultural remains associated with their bones. Crudely chipped stones could be accepted by such beast-men, but more than one author can scarcely suppress his surprise in noting that somehow these creatures for reasons unknown buried their dead. Not even the brightest chimpanzee ever thought of doing such a thing.

As study continued of more and more Neanderthal finds, considerable tension emerged between two incompatible sets of beliefs. On the one hand it was held that Neanderthal man was more animal than man. On the other hand it was becoming increasingly obvious that this half-human creature was doing some very sophisticated cultural deeds. Something eventually had to give.

Constable credits Neanderthals with a certain sophistication. He suggests that they invaded some very dry lands by using water vessels—not of pottery or the gourd; but ostrich egg shells have turned up alongside Mousterian tools. By conventional standards, so-called Mousterian tools were the trademark of the Neanderthal. The sun-baked Negev region of Israel is given as an example. This region, however, is near the plain around Sodom and Gomorrah which in historic times was said to have been watered like the garden of Eden. There is something wildly improbable about the Neanderthal chronology here.⁴³

Poirier observed that certain artifacts associated with Neanderthal remains suggest a certain sophistication in working skins and leather as well as butchery. Tantalizing finds of stone balls hint that they may have been utilized as bolas in hunting game. It must be said, however, that such round stones have not been found grouped as they have in ancient sites in East Africa.

It is curious that the bola has also been found among the Gauchos and among natives in the Rio Grande area in South America. Strangely, the Eskimos also made skillful use of this ingenious artifact.

Constable is willing to offer the conjecture that the Argentinian Gauchos who used the bola to capture their cattle had their counterpart in Neanderthal man who used the same artifact. His bola consisted of strips of rawhide weighted with stones and his target was the zebra.

Neanderthal man may have discovered the running rawhide noose, used as a snare or perhaps thrown as a lasso. Another mark of sophistication is indicated by the find of a Neanderthal burial deep inside a cave in Italy. The skull was found with a neat round hole bored into it.⁴⁴

An interesting link between past and present was found with some Neanderthal remains. The middle incisors are missing from the skull and they were deliberately removed. This custom is still found today among some African tribes, Australian aborigines, and other peoples.⁴⁵ While this may hardly seem like a sophisticated action, it is even less characteristic of the animal world.

Bear cults and rites involving the bear are still practiced today by hunting peoples from Lapland across northern Siberia and into the Arctic of the New World. Siberian tribes today still worship the bear as the mythical first man and make profound apologies to the animal before killing it. Elsewhere bears are thought to be intermediaries between men and the reigning spirits of the land. The Ainu of northern Japan capture a bear cub and treat it as an honored guest through most of the year. It is then sacrificed in the winter. Men drink its blood while the shaman prays for good hunting for the following year.

There is much evidence that the Neanderthals were deeply involved with bear cults and rites. One Austrian cave held the remains of an incredible 30,000 bears brought there by Neanderthals.

Neanderthal hunting magic is assumed to be centered in the bear cult. In the Drachenloch cave, at an altitude of 8000 feet, a scientist found a cubical chest of stones covered with a large stone slab. Inside were the skulls of

seven bears all arranged with muzzles facing the cave entrance. Still deeper in the cave were another six skulls mounted in niches in the walls.

At Regoudu in southern France, a rectangular pit was covered by a flat stone slab weighing about one ton. The pit contained the bones of more than 20 bears, including the now-extinct cave bear, larger than the grizzly.⁴⁶

Near Mixnitz, Austria, fifty-four bear thigh-bones were laid out in one direction in a cave. In another cave 42 bear skulls were found. In the Pyrenees at Montespan cave, a headless model of a bear was found. The skull of a real bear lay between the paws of the model. It may, however, have fallen off the model.⁴⁷

The present preoccupation of Russia and other countries with the trained bear may hark all the way back to such bear cult practices. Brodrich finds it hard to imagine that the same beliefs involving bears could be handed down over many thousands of years. If, however, ancient chronology is grossly in error, this interesting possibility ought to be explored.⁴⁸

Some religious significance must have been involved among Neanderthals in a remarkable cave burial studied in Bavaria. The severed heads of the dead had been placed into two scooped out nests in the earth, six in one and twenty-seven in the other, all wearing rich ornaments of deer teeth and shells. The skulls were sprinkled with red ochre, and all faced west toward the setting sun. From the charred remains nearby it was assumed that the bodies had been cremated. The precise symbolism involved in this practice is not known.⁴⁹ One can only guess at the rites performed in these caves.

Bodies were often bound in a peculiar fashion for burial. This had a religious significance. A strange kind of symbolism took place with the burial of a Neanderthal child in France. The skull and the skeleton were buried in a trench, but they were separated by a distance of about three feet. The skull was covered by a triangular limestone slab whose underside had a number of cup-shaped impressions. Cup marks were supposed to be a much more modern mystery, still unsolved. Nine curious circular Neanderthal graves, domed over with clay and arranged mysteriously in orderly rows of three, were found in 1909 at La Ferrassie, France.⁵⁰

Something of a stir was created in the 1960's when the remains of a Neanderthal man were found in the Shanidar cave on the Iraqi side of the Zagros mountains. The man, 5 feet 8 inches tall, had been buried on a bier of wild flowers. The find was dated as 60,000 years old. From the pollen, the blossoms were identified as hyacinths, hollyhocks, bachelor's buttons, and other species.⁵¹

According to an anthropologist from Columbia University, Neanderthal man appears to have known that certain plants possessed medicinal properties. The burial is believed to date back to 60,000 years ago. The scientists found that the body has been laid on shrub branches containing ephedrine, a nerve stimulant. Furthermore, among the wild flowers laid around the body, six are known to have medicinal properties.⁵²

It was becoming clear to some scholars at least, that

Neanderthal man displayed some very un-Neanderthal-like characteristics.

IV. The Scandal of the Neanderthal Brain

One who reads accounts of fossil man will note the great importance attached to brain size. The purpose is to show the evolutionary stages from the small ape brain to the large brain of modern man. The subject of the enormous variability within a species is carefully avoided in such accounts.

Le Gros Clark points out one special feature in the evolution of the primates (man and apes). That is the progressive expansion and elaboration (increasing complexity) of the brain. He states that there was a gradual increase in brain size since Eocene times in other groups of mammals as well.⁵³

The brain size of Neanderthal man is a perfect object lesson on how facts get into the way of theory. The unexpected outcome, however, in a scientific age, is that the facts are ignored or compromised. When an exception occurs, it is refreshing.

The average brain capacity of modern man is estimated at about 1450 to 1500 cubic centimeters.⁵⁴ Unfortunately for evolutionary theory, Neanderthal man had an average brain capacity of about 1600 cc.⁵⁵

It is dishonest for anyone to draw illustrations of a series of skulls showing increasing brain capacity in man. Some so-called ancestors of modern man possessed on the average a larger brain than modern man's.⁵⁷ It is embarrassing to argue that Neanderthal man evolved more brain capacity than he needed for the "sub-human" life-style depicted for him.

Boule resorted to phrenology. A detailed study of a cast made of the interior of the braincase of Neanderthal man convinced him that the brain was inferior in organization to that of modern man, particularly in the frontal lobes.⁵⁸

Brace adopts a most curious approach to the problem. First, as other have done before him, he states that Neanderthals possess brain cases of fully modern size. As already noted, this is less than an accurate statement. If the situation had been reversed, that is, if modern man averaged from 100 to 150 cubic centimeters more than Neanderthal man in brain size, this would be pointed to as convincing evidence of evolutionary change. Brace next attacks the reader who might ask why brain size has apparently decreased. According to him, the reader has failed to realize that we should think of the survival of the fit instead of the survival of the fittest. As soon as the brain achieved a size adequate for survival, there was no point in getting larger. In the face of such an explanation it would be surprising to find an *increase* in cranial capacity during the last 100,000 years. On the surface this seems a rather clever way of avoiding the question of why man's brain seems to have decreased in size.⁵⁹

It is very interesting to see how a variety of scholars and writers cope with an unwanted, unpalatable fact.

Rollard (1966) muddles the issue. (And the reader?) Lumping modern man's ancestors into a Neanderthaloid classification, he states that his brain capacity was small by our standards.⁶⁰

The *World Book Encyclopedia* (1966) is typical of many sources which are willing to concede that Neanderthal brains were as large as those of modern man. The writer could not quite bring himself to say that the brain size of the Neanderthal averaged larger than that of modern man's.⁶¹

Colbert is one of many writers on the evolution of man. He states that men advanced to evolve the maximum of brain power. It is difficult to argue that man's brain became smaller in order to advance to its maximum power, but in effect this is what Colbert is saying.⁶²

In *Man's Emerging Mind*, Berrill seems at a loss what to say. According to him, the Neanderthal brain may have been no worse than modern man's, whatever that might mean. Elsewhere he credits Neanderthal with brains as large as human brains are supposed to be.⁶³

Grasping at straws, Berrill suggests that the cortex of modern man may now be twice as large as it was in mid-ice-age men, and larger than it was in a Neanderthal. No evidence is given by the author.⁶⁴

Poirier is gamely honest but attempts to shore up a theory despite an unfortunate fact. He notes that the fossil record shows an evident trend to increasing brain size, although it is not a steady increase. He does note that the trend is not consistent since there was an actual reduction of approximately 300 cc. between the time of Neanderthal and modern man.⁶⁵

Eisely states that evolutionists showed a tendency to see biological inferiority in human forms older than modern man. Even when skulls were the same as modern man's, it was argued that they must have contained less gray matter and more interstitial tissue. Virchow argued against this notion almost a century ago. Plain evidence was rejected when it did not fit assumptions. For example, plain and obvious Neanderthal burials were rejected because it was held that Neanderthal men were not mentally capable of doing so. Nothing which indicated any intelligence could be accepted.⁶⁶

It was the large size of the Neanderthal brain that provided Le Gros Clark with the additional evidence he was seeking that Neanderthal man was not on the direct line of evolution of modern man. He admits that its large brain, larger than the average size of the modern human brain, makes it difficult to fit it into a scheme of the evolution of the brain of *Homo sapiens*. Yet he notes that the general shape of the brain showed certain features of primitive appearance. Despite its size, therefore, it was not up to the quality of that of modern man.⁶⁷

By 1976 Hawkes is able to acknowledge the actual size of Neanderthal's brain, but not without some ungracious comments on the side. Although Neanderthal was still somewhat beetle-browed and the vault of the skull was low, its capacity was large, allowing a brain size often above the modern average.⁶⁸

As standard texts go, Lasker is an exception in observing correctly that the Neanderthal brain was larger on the average than modern man's. Whereas brain size is stressed if it fits the theory, here Lasker cautions that Neanderthal man can't be assumed to be more brainy than modern man.⁶⁹

While the above is not intended to be an all-inclusive summary of views of Neanderthal man's brain, the examples cited above are instructive. It is obvious that an unpleasant fact poses no problem at all for the scholar who does not wish to recognize its existence.

It is refreshing to find an exception to the above nonsense in a statement by Stephen Molnar, the Associate Editor of the *American Journal of Physical Anthropology*. He stated that in modern populations there is such a wide range in variation that the lower end of the range is well below the capacity for certain fossil hominids. Yet there is no evidence that these individuals are any less intelligent than persons with larger cranial vaults. He concludes that comparisons of cranial capacity between modern groups is a futile and meaningless exercise.⁷⁰

V. A Slight Case of Honesty—Upgrading Begins

In September, 1974 the Museum of Natural History, Smithsonian Institution, opened a new exhibit which features a 50,000-year-old Neanderthal burial in France. The exhibit includes the bound body of a deceased male, a shaman (priest), and two women.

It is very interesting to see details of the exhibit since Neanderthal has been officially upgraded into full human status by scientists recently. The faces bear a rather stupid look. Yet, one must confess that neither the features nor the hair-do's would attract a second glance anywhere today. The big difference from older reconstructions is body hair. The deceased male seems almost devoid of body hair. The shaman is still well-haired all over. One of the ladies, alas, has hairy legs, but otherwise the ladies are as hairless as any Madison Avenue advertisement. While a black-and-white photograph may be deceptive, it appears that none of the four persons had ever stepped out of the cave into the sunlight. There is no trace of tanned or weathered skin.⁷¹ Thus Neanderthal has been welcomed into the human race in the 1970's.

Scientists sometimes remind other scientists to beware of reconstructions. One can scarcely open any book devoted to early types of man without being confronted with fanciful illustrations of Pithecanthropi, Australopithecines, or Neanderthals.⁷²

Simpson makes a very revealing assessment of the humbug which attends the study of fossil primates (monkeys, apes, and man):

The peculiar fascination of the primates and their publicity value have almost taken the order out of the hands of sober and conservative mammalogists, and have kept, and do keep, its taxonomy (or classification) in a turmoil. Moreover, even mammalogists who might be entirely conservative in dealing, say, with rats, are likely to lose a sense of perspective when they come to the primates, and many studies of this order are covertly or overtly emotional.⁷³

The reader will agree that this is an elegant way of saying that almost everything one is apt to read about the classification of fossil apes, men, men-apes, or ape-men is humbug, even though it is written by or quoted from the scientists in that field!

In connection with reconstruction, it should be noted that we do not know if Neanderthal's face was hairy or not, or if his skin was light or dark. It is instructive to place together all the reconstructions made of the same skeletal material. The variation is enormous.⁷⁴

After generations viewed hairy Neanderthal man in texts and museums around the world, Hawkes announces to the world in 1976 that there is no reason to believe that Neanderthal man had much body hair.⁷⁵

Why did the experts misjudge the Neanderthals? Why was very clear evidence to the contrary about Neanderthal shouted down? Neanderthal appeared at a critical moment in mid-nineteenth century. A faltering theory needing shoring up and Neanderthal was the best candidate for the task.

Eisely admits that Darwin's view of the gorilla-like Neanderthal fossil from La Naulette would have to be repudiated today. The teeth described as huge projecting ape-like canines were missing when the jaw was found.⁷⁶ The whole thing was fiction and was only something evolutionists wanted to believe.

It is interesting to observe that Thomas Huxley, a forceful champion of Darwin's theory of evolution, acknowledged that the Neanderthal skull seemed very ape-like, but "in no sense can the Neanderthal bones be regarded as the remains of a human being intermediate between men and apes."⁷⁷ Yet it took generations before Huxley's correct view became respectable among scholars.

C. Carter Blake, Honorable Secretary of the Anthropological Society of London (1862) held that Neanderthal man was a poor idiot or hermit, not like a normal, healthy, uninjured *Homo sapiens*. He was the first to say the remains were pathological.

The German anatomist Mayer in 1864 provided the most imaginative of the "idiotic" interpretations. The Neanderthal remains had been afflicted with rickets as evidenced by the pathology of the left arm. This affliction in turn caused the eyebrows to pucker, causing the enormous brow ridges. The bent femurs indicated that Neanderthal man had been a horseman. To Mayer the skull seemed more like a Mongol than it resembled an ape, gorilla, or New Zealander. He therefore concluded, unfortunately, that the remains were those of a Mongolian Cossack suffering from rickets who had died in the cave around 1814. In 1867 Dr. Barnard Davis stated that the Neanderthal skull proved nothing. It was obviously an abnormal development caused by ossification of the sutures. Similar skulls, he said, of modern men are in our museums.⁷⁸

According to Constable (1973), Rudolf Virchow (1821-1902), famed German anatomist-anthropologist, presented a closely reasoned paper in 1872 in which he state that the man from Neander Valley was not ancient at all, but was a modern *Homo sapiens* who had suffered from rickets in childhood, arthritis in old age, and had also received several stupendous blows on the head at some time during his life. Virchow is credited with being the father of modern pathology, and he also placed anthropology on a sound critical basis.

According to Constable, this pronouncement, coming from such a respected source, effectively silenced all further speculation. The fossil ceased to disturb scien-

tists. They simply forgot about it.⁷⁹ How Constable could make such a statement defies any sort of rational explanation.

In a 1964 publication, Brodrich still chastises Rudolf Virchow for being so obtuse and stubborn in failing to recognize the great significance of the original Neanderthal skeleton.⁸⁰

As of 1967 Brace lashes out at Virchow because Brace likes the idea of Neanderthal man being an intermediate step on the way toward modern man. Brace views Virchow as follows. He was a founder of German anthropology and the originator of the field of cellular pathology. Virchow was the most outstanding pathologist of the day. After a careful examination, he pronounced Neanderthal remains as pathological and sought to explain all of its peculiarities in that fashion. The body structure has been regarded as "aberrant" from the day to this, and authorities even today refuse to accept Neanderthals as something different from modern man. Brace believes that Virchow was wrong because other skeletons were found very similar to the first Neanderthal man. Brace thus states that after the second find it was no longer possible to expound with such certainty the supposed pathological features of the individual from the Neanderthal. However Virchow refused to back down and so the implications of abnormality and peculiarity tended to remain. Indeed, to this day, laments Brace, they have not been fully shaken off.⁸¹

The bones still exist in museums today. Curiously, Brace does not ask medical scientists to re-examine the bones to establish truth. He weeps that Virchow has spoiled a fervently desired theory.

In 1970 Ivanhoe discussed the possibility of rickets in Neanderthal man in *Nature* and suggested that the Neanderthals living in early Wurm times probably suffered from a vitamin D deficiency. He also stated that every Neanderthal child studied showed severe rickets. The title of the article, one hundred years overdue, was as follows: "Was Virchow right about Neanderthal?"⁸² Yes, he was.

Since Boule's monographs and reconstruction of Neanderthal man were the accepted view world-wide for at least two generations among scientists, it is well to take a closer look at his work. He was dedicated to prove the great antiquity of man, and he built his case on three fossils: Grimaldi man, Piltdown man, and Neanderthal man. While only Neanderthal man is under discussion in this paper, one can mention in passing that a recent analysis of the Grimaldi site in Italy, according to Constable, has shown that the fossil is actually of rather recent vintage, postdating the Neanderthals. The second bastion crumbled when the Piltdown skull was exposed as a fraudulent combination of chimpanzee and human skull pieces. The full truth of the situation, however, does not become apparent until one sees what Boule did with Neanderthal man. Recently the skeleton upon which he based his work was described in the following terms: In 1908 the crushed skeleton of a Neanderthal deformed by osteoarthritis and many signs of advanced senility was found at La Chapelle-aux-Saints in France. Unable to hunt and having only two teeth remaining, scientists infer that this man must

have been cared for by his companions. From this material Boule prepared his famous model of the "typical" Neanderthal man.⁸³

In 1939 Blanc and Sergi established that Neanderthal man stood as erect as modern man.⁸⁴ The world was not ready for this marvelous discovery, however, and more decades passed before Neanderthal man's rehabilitation really got under way.

The old prejudices began to evaporate in 1955, when several scientists again suggested that the slumped posture described by Boule might be in error. The major turnabout came, however, in 1957, when two anatomists, William Straus of The Johns Hopkins University and A.J.E. Cave of St. Bartholomew's Hospital Medical College in London, took a second closer look at the fossil from La Chapelle-aux-Saints that had provided the basis for Boule's contentions. The fossil was supposed to be typical. However, Straus and Cave discovered that this particular Neanderthal had suffered from a severe case of arthritis, which affected the structure of the vertebrae and the jaw. Boule, as a skilled paleontologist, should have detected the deformation of the bone joints indicating the disease.

Straus and Cave also spotted many other inexplicable mistakes in Boule's reconstruction. The Neanderthal foot, for example, was definitely not a "prehensile organ," as Boule has said. The neck vertebrae did not resemble that of the chimpanzee nor was the pelvis ape-like as he had claimed. Boule mistakenly arranged the foot bones so that the big toe diverged from the other toes like an opposable thumb. This was the source of the false belief that Neanderthal had to walk on the outer part of his foot, like an ape. Boule's interpretation of the knee joint, resulting in the so-called bent-knee gait, was equally incorrect. In every respect, the posture of Boule's reconstruction was incorrect. All in all, Straus and Cave found Neanderthal quite human indeed. If he were placed in a New York subway, it is doubtful that he would attract any more attention than some of its other denizens.

Neanderthal man is now officially *Homo sapiens neanderthalensis* vs. *Homo sapiens sapiens*. This indicates some differences, but he is squarely in the human fold.⁸⁵

Various embarrassed authors, barely recovered from the Piltdown disaster, are hard pressed to explain how they were all taken in by Neanderthal. As we shall illustrate, the favorite way out is to blame Boule, "the early twentieth century's foremost authority on fossils." This is the man about which prize pupil, Teilhard de Chardin, liked to say, "If you don't believe me, read the Master!" Other writers incredibly hide Boule away and blame the public. See, e.g., Brace below.

Broderick (1964) blames Boule for a reconstruction which led to a hundred other ridiculous reconstructions, all of which of course are covered with a thick coat of hair.⁸⁶

Brace manages to give equal blame to the "fascinated public" which, he says, invested Neanderthals with a hairy pelt and long simian arms. Nevertheless, Brace then says that Boule was in error on those matters. First Boule created a caricature; then he used it to proclaim that it could not be ancestral to modern man.⁸⁷

Out of respect for the man who had misled them in many previous editions of the *Britannica*, the 1967 edition does not mention Boule by name: "The popular conception that these people were slouched in posture and walked with a shuffling, bent-knee gait seems to have been due in large part to the faulty reconstruction of the skull base and to the misinterpretation of certain features of the limb bones of one of the Neanderthal skeletons discovered early in the 20th century."⁸⁸

One could hardly be more kind; but the statement is scarcely a recommendation for seventy years of hard labor in the field of human paleontology.

In the 1970's the *Britannica* takes a giant leap forward on behalf of interpreting Neanderthal and other ancient men. In speaking of the numerous fossil sapient found on all major continents, it is noted that the range of variability they exhibit is in no way greater than that known for the living races of modern man. This statement probably says far more than was intended since the author is firmly committed to evolution.⁸⁹

It is almost unheard of for a writer on human fossils to mention any point about human variability—the kind of variability we can see among any group of people today. The practice in human paleontology is to set up some kind of hypothetical but undefined modern man and then show how the fossil bones under discussion deviate from modern man. And since at least something is thicker or thinner or taller or shorter or higher or lower or more pronounced or less pronounced or more advanced or less advanced or completely something as opposed to less completely something else the case is proved beyond all argument.

Colbert, for instance, stated that all later men were advanced over their more primitive Neanderthaloid predecessors. And what make modern man more "advanced"? Modern man's posture is completely upright. Further, modern man has a high forehead, a highly domed skull, a highly bridged nose, and a pronounced chin.⁹⁰ The notion about posture, of course, refers to Boule's erroneous reconstruction. None of the other characteristics noted has anything at all to do with being more or less advanced. They are all normal variations found within a given species.

In 1971 *Time* upgraded Neanderthal man. His primitiveness is unwarranted. His apish image was largely due to an early 1900's reconstruction by French paleontologist, Pierre Boule. But as a Harvard anthropologist said, "One can model on the Neanderthal skull the features of the chimpanzee or the face of a philosopher."⁹¹ Evidently Boule made only a small but honest mistake.

The 1966 Edition of the *World Book Encyclopedia* offers a delightful example of the left hand not knowing what the right hand is doing. We read that at first scientists thought that Neanderthal was a squat, stooping, brutish, somewhat ape-like creature. But later "research" showed that the bodies of Neanderthal men and women were completely human, fully erect, and very muscular. This is not quite the whole truth, since the correct information about Neanderthals had been lying around for more than a century. Under another heading in this encyclopedia a Neanderthal family is pictured, and they can only be described as squat,

stooping, brutish, and somewhat ape-like creatures!⁹²

On rare occasions, one can find a candid assessment of the whole matter. Pfeiffer noted in 1969 that the reconstruction of the La Chapelle remains was "one of the most amazing phenomena in the history of man's efforts to downgrade his ancestors."⁹³ And that seems to say it all.

VI. A Matter of Sequence

Large amounts of scholarly energy went into the problems of sequence for Neanderthal man. For decades it was assumed and taught that primitive Neanderthal man evolved into modern man. The alternative was that Neanderthal was some kind of subhuman offshoot who eventually became extinct. Many kinds of conjecture were offered in support of one or the other view. Since both views were respectable in some of the best circles, the arguments did not become particularly heated. Complications, however, arose.

In 1947 scientists found two skulls of modern type lower than tools of Neanderthal man. Since the skulls were separated from the tools by a layer of limestone, they could not have been interchanged, and therefore the remains of modern type were older.⁹⁴ If it had not been for the layer of limestone, all kinds of explanations would have been offered for the material being out of the "proper" sequence.

The following year Jacob Gruber called for a re-examination of the place of Neanderthal man in human evolution. It was clear that the remains of *Homo sapiens* who lived before Neanderthal man had been found, and the finds were apparently substantiated.⁹⁵

It hardly needs to be said that such a discovery created havoc for an enormous amount of writing about early man.

In the following decade Weiner joined other authorities in acknowledging that fully developed modern man predated Neanderthal man. Neanderthal could not be ancestral to modern man.⁹⁶

At the same time Weckler summed up a century of study and speculation about Neanderthal man. Neanderthal is termed as still perhaps the most puzzling enigma about ancient man. Somehow the story now had to read that both modern man and Neanderthal roamed the world 100,000 years ago. The unpalatable fact was that the skull of Fontchevade man, discovered in 1947, seemed to be fully *Homo sapiens*, but he is dated at more than 150,000 years ago, well before Neanderthal man is supposed to have come along.⁹⁷

As late as 1964 Brodrich affirms that Neanderthaloids disappear about 45,000 years ago, but *Homo sapiens* did not appear until about 12,000 years later. If we take this remarkable view seriously, modern man had to do a very rapid job of evolving from some kind of unspecified life in a mere 12,000 years.⁹⁸

William G. Pollard, in the *Cresset*, wrote that our species, *Homo sapiens*, entered explosively on the stage of history all over the earth only 35,000 years ago, as the ice retreated from Europe after the last ice age. One is tempted to ask whether they were shot from guns. Prior to that, Pollard continues, there had been the Neanderthaloids. (This is a slippery term which

sometimes means supposed ancestors of Neanderthal, sometimes means creatures who lived after Neanderthal man but who predated modern man, and the word sometimes includes Neanderthal man himself.) The Neanderthals preceded modern man for some 80,000 years. While they used fire, flint implements, and buried their dead, "they would really not be considered human if they were encountered today."⁹⁹

With remarkable originality, Brace solves the whole dilemma by smelling a plot against Neanderthal man. Evil British anthropologists, because of their long-standing lack of enthusiasm for facing the possibility that man may have had a Neanderthal ancestor, were desperately eager to find evidence of modern form at an earlier time level than that attributable to the Neanderthals. As a result, modern features were stressed whenever possible, and, in the case of the Swanscombe skeletal remains, with the all-important facial parts missing, opinions about its status could be pushed without much risk of encountering solid objections from any quarter whatsoever. By default, then, Swanscombe has been regarded as modern ever since. Brace does not accept the finds at Fontchevade or Steinheim as being modern man either. He concludes that desperate people are simply trying to "prove" that Neanderthal man could not be ancestral to modern man.¹⁰⁰

A popular view long held is that Cro-Magnon man caused the extinction of Neanderthal man. What is the evidence? According to Constable, cave strata sometimes showed the following: Neanderthal layers fading to sterile layers followed by Cro-Magnon layers. He notes, however, that there were many exceptions. Often there was no break between the two cultures, and one cannot really show that one culture disappeared to be replaced by another. Out of desperation Constable is led to suggest that maybe Neanderthal actually evolved into Cro-Magnon.¹⁰¹

As recently as 1974 Claiborne illustrates the ambivalence toward Neanderthal man. Despite racial differences among men in color and anatomy, we are left uncomfortably with only one human species. Yet differences much less than these in animal groups are easily accepted without argument as different species. Claiborne stresses how different Neanderthal man was from modern man. This is a curious and biased statement. Just what color, physique, and facial features constitute so-called Modern Man? There is a strange and unscientific persistence in equating the shape of the skull with intelligence and sophistication, although this notion, akin to phrenology, fell into disrepute in the nineteenth century except among some human paleontologists.

In a strange survey of history, Claiborne notes that the theory of evolution was long attacked on the ground that there was no missing link of man and ape. He makes no mention of the fact that for generations Neanderthal man was loudly proclaimed to be just that. Now that Neanderthal man has reluctantly been permitted to join in full the human race, Claiborne smoothly slides over to the discovery of the Australopithecines in the 1920's and 1930's as settling the missing link argument. For those who are still not impressed,

Claiborne fires his last cannon: the 50-million year detailed transitional record of the horse!¹⁰²

On both counts, however, we are back to square one. According to Dr. Charles E. Oxnard, University of Chicago anthropologist, the missing link is missing again. The Australopithecines are not an ancestor of man.¹⁰³ And according to George Gaylord Simpson, the transition of the horse, so neatly pictured everywhere, never happened.¹⁰⁴

Le Gros Clark takes an interesting view of the Neanderthal matter as of 1957. Aware that modern man preceded Neanderthal man, and assuming he was not ancestral to *Homo sapiens*, he argues that the apparently primitive features are a result of a retrogressive evolution from still earlier types which do not appear distinguishable from *Homo sapiens* or modern man.¹⁰⁵ He thus takes the "dangerous" view that evolution moved from higher to lower forms. Evidently Le Gros Clark did not realize the devastating consequences of such a view for evolutionary theory. The possibility of a degenerative process within evolutionary theory is sharply rebuked by Loren Eiseley.¹⁰⁶ Lubenow shows why. If reversals occur in evolution, then stratigraphy is futile. Evolutionary theory could not survive this view. The law of irreversibility was originated by Dollo in 1893. It holds that an organism is unable to return even partially to a previous stage already realized in the ranks of its ancestors. Yet Lubenow documents a large number of such impossible reversals.¹⁰⁷ It seems clear that Dollo's law does not describe the real world.

Every time Neanderthal's I.Q. is put down, along comes other information to raise it. Many authorities today grant the possibility that Neanderthal man might be a direct ancestor of modern man. First *Homo sapiens* evolved into Neanderthal man. Now Neanderthal man has evolved back into modern man, not too much the worse for wear.

VII. Could Neanderthal Man Have Been "Recent"?

As the textbooks have it, the very last of the Neanderthals regrettably gave up the ghost roughly 45,000 or so years ago, when the world was still filled with many now extinct mammals. The find at Teshik-Tash or Pitted Rock, which lies about 5000 feet above a valley in the USSR Republic of Uzbekistan, is enough to make an anthropologist give up his profession. In this cave about 64 feet wide, many typically Neanderthal artifacts were found. Here also a Neanderthal child had been buried, circled by pairs of Siberian mountain goat horns as a ritual arrangement. The problem is that the associated fauna bones are all wrong. They are modern forms, e.g., the boar, the mountain goat, horse, leopard, marmot, and others. Not a mastodon or sabre-tooth was to be found.¹⁰⁸ One might be understandably reluctant to believe that at this place, not knowing that they had become extinct, Neanderthals continued to live on quietly until modern times. Again conventional chronology is found seriously wanting.

It is sometimes very difficult to extinguish the Neanderthal race thousands of years in the past. Custance cites an example in France where Neander-

thal remains could hardly be dated more than 20,000 years ago. Then it was found that birch trunks in place rooted and extended up through 3,000 years of the deposits. Then Roman remains were also found in the deposit which indicated that the entire deposit could not be more than 3,000 years old.¹⁰⁹

For a time it was fashionable to find Neanderthal remains almost anywhere in the world. In 1891, a classic Neanderthal skull was found in a mound at Floyd, Iowa.¹¹⁰ At most, however, this skull could not be much older than 2000 years, while the scholars had decreed that the last Neanderthal expired many thousands of years ago. The finds then had to be ignored or written off as cases of mistaken identity.

In 1906, Robert Gilder excavated skeletons from an artificial mound on Long's Hill about ten miles north of Omaha, Nebraska. What caused consternation was that the bones were under about four feet of undisturbed loess soil. While little is known about loess soil deposits, they are usually dated about 6000 B.C. Further, the skeletons were said to exhibit very primitive characteristics. For a time the find was called the Nebraska Loess Man. The finds were studied by Alex Hrdlicka of the United States Museum and as a result he disputed both the geology (i.e., the loess) and the antiquity of the skulls.

It is of great interest to note his argument. He took such characteristics of Neanderthal man as thick cranial bones, heavy brow ridges, low receding foreheads and stated that they were not evidence of antiquity since the same characteristics were commonly found among historic Indians.¹¹¹

We are then left with the impossible result that heavy brow ridges indicated great age if the skull was found in Neanderthal territory, but the same skull would be very recent if found in America where no Neanderthal remains were supposed to be found.

A tribe of aborigines in Australia, the Arunta, drew attention decades ago with respect to their physical appearance. They are noted for their excellent teeth, but the teeth are of large size. Some of the tribesmen grow extra molars which some authorities believe links them with so-called earlier human types. Evolutionist Thomas Huxley was the first to draw attention to similarity of the skull of these aborigines to prehistoric Neanderthal man.¹¹² More recently, Brace (1967) notes that the facial form of the aborigines is remarkably similar to that of the Neanderthaloids of Mount Carmel.¹¹³ As noted elsewhere, however, other authorities decreed that Neanderthal man never reached Australia.

The following are interesting lessons about human variability. In 1930 Prof. F.C. Hansen, Copenhagen, received human bones from a 12th century graveyard in Gardar, Greenland. The lower jaw and large part of the skull were more ape-like than the Rhodesian skull, and very much like the Java and Peking skulls. Also in 1930 the skull and skeleton of a criminal executed in 1892 were exhumed in Australia. The bones exhibited very remarkable anthropoid-ape characteristics, yet it was a fully modern man.¹¹⁴ Brodrich also refers to the Greenland find, but dates the skull from the 11th century and the find in 1927. Hansen observed that if the

skull had been discovered in a Mousterian context in the correct part of the world, it would probably have been accepted as Neanderthaloid. It was further noted that a malfunction of the pituitary gland will produce either or both gigantism and the abnormal growth of certain parts of the body, e.g., the skull.¹¹⁵

A "classic" Neanderthal man was noticed in Morocco some years ago and was photographed to show that he possessed all the physical characteristics attributed to Neanderthal man.¹¹⁶

In 1968, Otto F. Reiss, editor of *Art and Archaeology*, undoubtedly lost some subscribers when in a period of pure speculation he said yes to the possibility that Greek myths may have retained a memory of events many thousands of years earlier, e.g., Cro-Magnon contacts or battles in Greece with Neanderthals. Reiss then offers three candidates for the role of Neanderthal man or some other primitive man in the Greek myths.

One is the cercope. In one relief two of them are shown as prisoners of Heracles. They were described as a monkey-like species, yet capable of speech. In the relief they appear to be completely human.

A second candidate might be the centaur, fabled half-man and half-horse. In a relief which shows Heracles killing a centaur, one must look sharply to realize that the figure is not just a huge-torsoed man with very short legs. Greek tradition states that the centaur fought with a branch broken off the nearest tree. This centaur holds a rock, but in another later restoration a centaur wields a branch. The centaurs were said to be creatures of nature who ate raw meat and enjoyed the flesh of toads, snakes, and dogs. They were afraid of fire. The Lapiths fought a battle with the centaurs and drove them from their home at Mount Pelion. To this day superstitious peasants fear the callicantzaros (whose name seems to echo the word centaur), an eerie apparition that haunts the countryside at night to perpetrate all sorts of mischief.

The third candidate is the giants of the Greek myths, those powerful creatures with mighty torsos who could not stand up because their legs, supposedly made of coiling serpents, barely supported them. It is said that the giants arose against the Greek gods. In a terrible battle the giants were annihilated by them. Reiss speculates that such a battle could have taken place in the Louros Valley in northern Greece. In a rock shelter there the artifacts typical of Neanderthal man are succeeded in turn by Upper Paleolithic remains and then pottery sherds. Some think it is the site of the oldest human habitation yet found in Europe.

Reiss muses that possibly some of those old-world apparitions, the trolls, kobolds, callicantzaros, others lurking in the forest, and the demons against whom people barred their doors and windows at night were not figments of superstition but the starving, desperate holdouts of almost extinct species.¹¹⁷

In a source I cannot identify, I saw a photograph of the sculptured head of a Neanderthal man. What made it so unusual was the fact that it had been excavated from an ancient Greek (Mycenaean) site.¹¹⁸ Could anyone dare to say that there had been actual contacts between the two peoples? The possibility seems unthinkable.

Some startling reports have emerged out of Ceylon in recent years about some creatures apparently related to Neanderthal man which are said to have been killed off by the dominant people in that region, the Vaddas, as recently as the early 1800's A.D. These reports were transcribed from oral tradition. The creatures were a naked, shaggy race possessing short powerful arms and short hands furnished with strong clawlike nails. They did not know the use of fire, and their only weapons were stones and their claws with which they tore and disembowelled their prey or enemies. The creatures called Nittavo (probable meaning is the 'clawed folk') lived in bands of ten to thirty, and lived in caves and rock clefts or in trees on platforms covered with a roof of leaves. Their language resembled the twittering of birds. Their main food consisted of mousedeer, hare, squirrel, iguana, and tortoise. A fossil human brow ridge displaying Neanderthaloid characteristics was found in the area, conceivably from an early Nittava, but there is no way this can be verified. In the early 19th century, the Vaddas drove the last surviving group of Nittavo into a cave in the Lenama district and suffocated them by maintaining a fire at the mouth of the cave for three days.¹¹⁹

Another possible link of the past with the present is related by Constable. On an April evening in 1907, a caravan led by the Russian explorer, Porshnyev Baradiin, made camp in the central Asian desert. It was a bleak land of rock and sand, silent and empty. Suddenly a member of the group saw silhouetted against the setting sun a huge slouching figure resembling a cross between man and ape. The shaggy brute stared, then turned and lumbered off. The story is undoubtedly overdone; and the author concludes the account has to be nonsense, especially since the Neanderthal is supposed to have disappeared many thousands of years ago.¹²⁰

The word "documented" seems to reach a new low with the following "documented" account from Russia by Boris Porshnev. A young girl of pronounced Neanderthal characteristics was captured by hunters near the town of Ochamchire on the Black Sea. She eventually became the property of a family by the name of Genaba. She died in the late 1800's. At first she was kept in confinement, but later she was given free movement. She could not speak but made sounds that carried rudimentary intent. She however could understand and follow orders. She performed simple tasks, but she had immense physical powers. For example she could outrun a horse easily and could swim through the most turbulent waters. (How the hunters were able to capture this biological wonder, we do not know.) She was described as tall, bulky, with dark skin covered with red-brown hair. Her face was broad with prominent, high cheek bones, a very flat nose and small eyes which in certain lights appeared red. Apparently no one this attractive had ever been seen in this area and men found her irresistible. She became the mother of a number of children by several fathers. The first children are thought to have died because she plunged them into the icy waters of the river to cleanse them. After she found that this custom was unprofitable she had four more children which survived. The youngest, Khvit, died in 1954 at the age of 70. All four children were

considered human and they had children who are now living in the Caucasus republic of Abkhaz. Khvit's voice was high and adept at imitating animal calls, and his children were described as slightly negroid.¹²¹

VIII. A Bit of Scholarly Backlash and More Confusion

Today, about 125 years after Neanderthal man was discovered, it is interesting to attempt to classify the kinds of things being said about this much maligned creature. We can note a number of categories.

A naive reader might think that a theory of early man is greatly weakened by recent revelations about Neanderthal man. Man, however, has an enormous tenacity and genius for clinging to the husk of an untrue concept.

(1) Some writers merrily go on about Neanderthal as though nothing has come to light in the last quarter of a century. They of course reveal that they haven't bothered to stay up with their reading, or they blithely ignore the facts of the matter.

With all the recent literature, it is truly astonishing to note the following statement by a scientist in a book published by a university press in 1973. The statement is that the first "modern" man, Cro-Magnon Man appeared in the world about 50,000 years ago. Further, *if* we admit Neanderthal man to the human race, then our species (modern man) has been around for only 100,000 years at the most. Anything before this time is classed as primitive, barely human creatures who date all the way back to three million and more years ago.¹²²

The person who does not blindly accept without evidence what authorities declare will remind the evolutionists that large amounts of skeletal material in the past were discarded when they did not fit presuppositions about man's evolution. Evolution seems to be the only scientific pursuit where false information is hailed as a "powerful validation of Darwin's views on human evolution."

(2) Some correction have been made.

According to Pearce (1969), all museum exhibits have been altered to show that all fossil men remains reveal them as walking upright, except in Russia. As Garlick, an authority on human fossils, said, "The origin of *Homo sapiens* is more of a mystery than ever!"¹²³

(3) There is a fair amount of confused doubletalk.

By 1964 the ancestry of man became sufficiently confused to lead Brodrich to proclaim in words difficult to refute: "The evolution of the hominids, in fact, resembled that of most other mammalian lines for which we have enough evidence to judge. Some forms developed in one direction, some in another. Some forms did not evolve as fast as others. Thus, the family bush of our kind is a tangle and tufted one that sprouts and shoots out in all directions."¹²⁴

Literature on Neanderthal man is not intended to be read carefully. The fact that Neanderthal man was fully human, fully *Homo sapiens*, creates an unbearable tension with the fervent belief despite the facts that Neanderthal man was some kind of link between a more primitive form of man and the modern man. We now read such embarrassing statements as this: *Homo sapiens* had evolved into a true Neanderthal about

100,000 years ago. This is like giving the startling news that *Homo sapiens* evolved into *Homo sapiens*. Constable concedes that *Homo sapiens*, or modern man, had been around for at least 200,000 years before Neanderthal man came along. Writers on the subject don't know how to end the story of Neanderthal man, and they are about equally divided that Neanderthals were killed off by *Homo sapiens* in the form of Cro-Magnon man, or that Neanderthals were assimilated into modern man. This means that even your next door neighbor might be a carrier of Neanderthal blood.¹²⁵ Others say that the fate of Neanderthal man is unknown. Robert Ardrey managed to take two different positions on the matter within two pages: first that their fate is unknown; then with equal certainty he stated that Cro-Magnon killed all the Neanderthals.¹²⁶

(4) Some tend to throw up their hands about the whole business.

Poirier paints an interesting picture of the nightmare that Neanderthal has become to the anthropologist. Skeletons simply were not fitting into the preconceived notion of how man was supposed to have developed. Poirier states that until this wide range of fairly numerous fossil materials is arranged into some kind of order, and the temporal, geographical, and cultural boundaries delimited, confusion will reign. That the assumptions and dogmas about man's supposed evolutionary development might be all wrong does not occur to him.

Furthermore, the appearance of what seems to be more "modern" forms in Europe actually predating the European Neanderthal population raised the spectre of evolutionary reversals (a very distasteful line of thought), polyphyletic lines of the evolution of man, and so on.

The existence of a quite variable middle eastern population predating and living contemporaneously with the European Neanderthals complicates the picture. Many a fairy tale about Neanderthal man went down the drain with this discovery.

Finally, what appeared to be the overnight disappearance of western European Neanderthals, and their replacement by Cro-Magnon (anatomically modern) populations, smacked of catastrophism, a process akin to the Biblical flood. Needless to say such a view was for the anthropologist a fate much worse than death.¹²⁷ To sum up, it is no longer quite as much fun being an anthropologist these days as in the good old arrogant days in the past when creationists were on the run.

(5) Some are bloody and bowed, but far from broken. If the hard parts of the body can't be used to support evolution, the argument shifts to the safer world of the soft parts of the body which have not been preserved.

As we find the matter recorded in the *Smithsonian* (1975): "For a while there it seemed that Neanderthal man had been rehabilitated and was slipping closer to the mainstream of human evolution, but the situation remains fluid . . ."

The author offers two findings in support of his fond hope. First, he cites the British scientist who found that Neanderthals' thumbs were barely opposable.

Comment: It is remarkable that more than 125 years have gone by before any scientist looked at the thumbs

and found they were scarcely opposable. One can safely assume that this scientist studied a hand crippled by rickets, arthritis, and advanced senility. Looking back at Boule's reconstruction, we observe that he not only found Neanderthal man's thumbs opposable, but he also rearranged his toe bones in order to make his big toes opposable like thumbs.

The second finding is the one about Neanderthal's vocal chords. To sum it all up, Neanderthal man couldn't talk if he wanted to, but chimpanzees could talk if they wanted to. There are a number of remarkable things about this so-called finding. The computer is invoked to lend an air of plausibility to the whole humbug. Computers respond only to what is programmed into them. The vocal chord study was done with the "classic" skeleton described as crushed and deformed by osteoarthritis and many signs of advanced senility. No vocal chords have been preserved from any Neanderthal burial, and this shift of study from hard to soft unpreserved body parts is hardly convincing.¹²⁸

Another author finds a new way to make Neanderthal man less than modern man.

It is not good that Neanderthal man appear to be too bright, and so he put down as follows: He never reached the heart of tropical rain forests, and they probably did not make much of a dent on thick forests of the far north. How do we know? No skeletons have been found in those regions. This is hardly convincing evidence. Further, Constable is ready to grant that it was theoretically possible that Neanderthals could have reached the New World. According to Constable a few seemed to have got to the southern part of Siberia. In a remarkable display of logic, we learn that Neanderthals did not reach America. Not only that, they failed to reach Australia. The conclusion? In these ways and in many others, they did not measure up to the men who came after them.¹²⁹ Cro-Magnon man did not reach America or Australia, yet he measures up. If the stereotype of Neanderthal man falters as to his physical makeup, we see that he is made primitive nonetheless.

(6) Some shift to a totally different explanation for skeletal features—one that undercuts the whole scheme of human evolution.

Hawkes is surprised that Neanderthal's brain is so large, and she is even more surprised that the fossils with the less primitive features are the more ancient. She explains it this way. Those who lived in brutally harsh glacial conditions were affected physically, and thus such primitive features as heavy brow ridges and jaws were accentuated.¹³⁰

Comment: There is evidence elsewhere that climatic conditions do affect the physical appearance. Such an admission, however, is disastrous for evolutionary theory, which depends on demonstrating some kind of sequence from primitive to modern. If appearance is more a climatic matter than one of evolutionary development, there is no point in trying to establish sequence any longer.

(7) Some scientists show refreshing signs of humility.

It is interesting and illuminating to read and reread a statement from Weiner in 1958 about the origin of modern man:

The accumulation of fossil material in relative abundance over the last fifty years has revealed the total inadequacy of this simple linear sequence; the analysis of the phylogeny (or evolutionary development) of *Homo* (modern man) has in fact been attended by many difficulties and inconsistencies.¹³¹

(8) And finally, some draw a moral from the whole unfortunate tale.

In discussing the Neanderthal controversy, Jacob Gruber (1948) makes the following comment:

"The pat answers of Cuvier (a catastrophist) and the religio-scientific dogmas (this apparently means science polluted by religion) surrounding the search for man's origins are almost forgotten in our own enlightenment. But it is disconcerting to find the Cuviers, the Mayers, and Virchows—all as equally devoted to the methods and objectives of modern science as any of today's scientists—with intellects imprisoned and imaginations shackled by hypotheses of their own making, hypotheses purportedly based on fact and uninfluenced by metaphysical considerations. It is disconcerting to realize that as their intellects were shaped and limited by the dogmas—often scientific—of their day, so may the intellect of the modern investigator be shaped by the a priori judgments of his time, the unproved hypotheses and overgeneralizations, the results either of the non-scientific environment in which he lives and works or of the sometimes equally non-scientific traditions he follows. One sometimes wonders how many "rickety Mongolian Cossacks" exist in the controversies and conclusions, the debates and deductions, of today."¹³²

And so we have the story of Neanderthal man, a tribe of hunters who roamed over a broad geographical area. These people were as different from Modern Man as the rather odd person who lives down the street today, or as the even odder person who peers astonished at the viewer from the bathroom mirror each morning. No one would be more amazed than they at the fanciful tales spun by scientists who were out to firm up a theory, and who were not about to let any inconvenient facts get in the way.

Bibliography

- AIID The American Heritage Dictionary of the English Language. New York: American Heritage Publishing Company, Inc., 1969.
- ANO Anon. Did Man Get Here by Evolution or by Creation? Brooklyn: International Bible Students Association, 1967.
- ART *Art and Archaeology Newsletter*
- BRL Berrill, N.J. Man's Emerging Mind. New York: Fawcett World Library, 1955.
- BRC Brace, C. Loring. The Stages of Human Evolution. Englewood Cliffs, N.J.: Prentice-Hall, 1967.
- BRO Brodrick, Alan Houghton. Man and His Ancestry. New York: Premier, 1964.
- C74 Charroux, Robert. Masters of the World. Lowell Blair, Tr. New York: Berkley Medallion Book, 1974.
- CHL Childe, Gordon. What Happened in History. Baltimore: Penguin, 1942.
- CBO Claiborne, Robert. God or Beast. New York: Norton, 1974.
- COL Colbert, Edwin H. Evolution of the Vertebrates. New York: Wiley, 1955.
- CST Constable, George. The Neanderthals. New York: Time-Life Books, 1973.
- COP Coppedge, James F. Evolution: Possible or Impossible? Grand Rapids: Zondervan, 1973.

- COR Corliss, William R. (Compiler). Strange Artifacts. Vol. M-1. Glen Arm, Md.: Author, 1974.
- CRS *Creation Research Society Quarterly*.
- CRE *Cresset*.
- C33 Custance, Arthur C. The Fallacy of Anthropological Reconstructions. Doorway Paper #33. Brockville, Ontario: Author, 1966.
- C45 Custance, Arthur C. Fossil Man and Genesis. Doorway Paper #45. Brockville, Ont.: Author, 1968.
- DFP *Detroit Free Press*.
- ESL Eiseley, Loren. Darwin's Century. Garden City, New York: Doubleday Anchor, 1958.
- E11 Encyclopedia Britannica. 11th Edition, 1910-1911.
- E15 Encyclopedia Britannica. 15th Edition, 1974.
- GAR Gardner, Martin. Fads and Fallacies in the Name of Science. New York: Dover, 1957.1
- HKS Hawkes, Jacquetta. The Atlas of Early Man. New York: St. Martin's Press, 1976.
- HLL Howells, William (Ed.). Ideas on Human Evolution. Selected Essays, 1949-1961. New York: Atheneum, 1962.
- HUN Hunter, Don and Rene Dahinden. Sasquatch. New York: New American Library, 1973.
- HUY Hurley, Patrick M. How Old Is the Earth? Garden City, New York: Doubleday, 1959.
- JVI *Journal of the Transactions of the Victoria Institute*.
- KLU Kluckhohn, Clyde. Mirror for Man. New York: Fawcett, 1944.
- K73 Kolosimo, Peter. Timeless Earth. New York: Bantam, 1973.
- LEG le Gros Clark, W.E. History of the Primates. Chicago: University of Chicago Press, 1957.
- NAT *Nature*
- NYT *New York Times*
- PEA Pearce, F.K. Victor. Who Was Adam? Toronto: The Pater-noster Press, 1969.
- POI Poirier, Frank E. Fossil Man. St. Louis: Mosby, 1973.
- POL Polack, W.G. The Handbook to the Lutheran Hymnal. 2nd ed. St. Louis: Concordia Publishing House, 1942.
- SYR Science Year. The World Book Science Annual 1972. Chicago: Field Enterprises Education Corp., 1971.
- SCA *Scientific American*.
- SCM *Scientific Monthly*
- SIM Simpson, George Gaylord. *Life of the Past*. New York: Bantam, 1953.
- SMI *Smithsonian*.
- TER Ternes, Alan (Ed.). Ants, Indians, and Little Dinosaurs. New York: Charles Scribner's Sons, 1975.
- THO Thomas, William L., Jr. (Ed.). Yearbook of Anthropology-1955. Vol. 1. New York: Anthropological Research Inc., 1955.
- TIM *Time*.
- UNN University of Nebraska, Lincoln, News: Museum Notes No. 54. Vol. 55 No. 11, October 20, 1975.
- VAN van der Veer, M.H. and P. Moerman. Hidden Worlds. New York: Bantam, 1972.
- VIT Vitaliano, Dorothy B. Legends of the Earth. Bloomington: Indiana University Press, 1973.
- WEY Weyer, Edward, Jr. Primitive Peoples Today. New York: Doubleday Dolphin, 1961.
- WBE World Book Encyclopedia, 1966.

References

- ¹AHD, p. 876
- ²POL, p. 552-553, Ell:19, p. 320-321
- ³Ell:19, p. 321; SCM:67 12/48, p. 437-438
- ⁴Ell:19, p. 321; CST, p. 27
- ⁵BRC, p. 21-22
- ⁶SCA, 12/57; HUY, p. 108, 131; BRO, p. 212; PEA, p. 42; CBO, p. 184; KLU, p. 62
- ⁷VAN, p. 44
- ⁸HUY, p. 108, 131
- ⁹BRC, p. 100
- ¹⁰CST, p. 17

- ¹¹BRC, p. 22
- ¹²POI, p. 176
- ¹³CST, p. 19
- ¹⁴POI, p. 174
- ¹⁵CST, p. 27-28
- ¹⁶CST, p. 20-21
- ¹⁷SCM:67 12/48, p. 438
- ¹⁸BRC, p. 23-24
- ¹⁹CST, p. 20-21
- ²⁰ESL, p. 277; THO, p. 63;
CRS 9:4 3/73, p. 205
- ²¹CHL, p. 8, 33
- ²²BRL, p. 82
- ²³SCA, 12/57
- ²⁴LEG, p. 157-165
- ²⁵HLL, p. 530-531
- ²⁶HUY, p. 108, 131
- ²⁷CRE, May/June '66, p.
24ff.
- ²⁸CST, p. 23
- ²⁹BRC, pp. 5-6.
- ³⁰K73, p. 2
- ³¹SMI, 11/73 4:8, p. 10, 75
- ³²NYT, 4/25/71, p. 177
- ³³HUN, p. 185
- ³⁴VAN, p. 29-30
- ³⁵SYR, p. 291
- ³⁶VAN, p. 32
- ³⁷HUN, p. 181
- ³⁸SCA 6/74 230: 103
- ³⁹CBO, p. 184
- ⁴⁰BRC, p. 100
- ⁴¹SMI 11/73 4:8, p. 10, 75
- ⁴²GAR, p. 135-137
- ⁴³CST, p. 55, 58
- ⁴⁴POI, p. 169, 173; Ell:4,
p. 158; CST, p. 36
- ⁴⁵VAN, p. 28-29
- ⁴⁶CST, p. 108-109
- ⁴⁷BRO, p. 218
- ⁴⁸BRO, p. 218
- ⁴⁹BRL, p. 105
- ⁵⁰CST, p. 97-98
- ⁵¹TIM 6/21/68, p. 34
- ⁵²DFP 1/15/76, p. 78
- ⁵³LEG, p. 178-179
- ⁵⁴VAN, p. 31
- ⁵⁵C74, p. 248
- ⁵⁶CRS 3:4 3/67, p. 24
- ⁵⁷PEA, p. 14
- ⁵⁸BRC, p. 22
- ⁵⁹BRC, p. 89
- ⁶⁰CRE, May/June '66, p.
24ff
- ⁶¹WBE:7, p. 25
- ⁶²TER, p. 180
- ⁶³BRL, p. 82, 101
- ⁶⁴BRL, p. 227
- ⁶⁵POI, p. 55
- ⁶⁶ESL, p. 298
- ⁶⁷LEG, p. 164-165
- ⁶⁸HKS, p. 19
- ⁶⁹CRS 13:3 12/76, p. 168
- ⁷⁰CRS 13:3 12/76, p. 168
- ⁷¹SMI 5:6 9/74, p. 110-11
- ⁷²BRO, p. 175
- ⁷³HLL, p. 525
- ⁷⁴CST, p. 7-8
- ⁷⁵HKS, p. 19
- ⁷⁶ESL, p. 277, 288-289
- ⁷⁷CST, p. 9, 14
- ⁷⁸SCM:67 12/48, p. 438;
JVI:2, p. 72
- ⁷⁹CST, p. 14-17
- ⁸⁰BRO, p. 213
- ⁸¹BRC, p. 12-17
- ⁸²POI, p. 176-177; NAT 227
(5258) p. 577-579
- ⁸³BRO, p. 173, CST, p.
23-24, 101
- ⁸⁴C33, p. 5-12
- ⁸⁵CST, p. 19, 27-28
- ⁸⁶BRO, p. 173
- ⁸⁷BRC, p. 22
- ⁸⁸COP, p. 187
- ⁸⁹E15 macro 11, p.
418-431
- ⁹⁰TER, p. 182
- ⁹¹TIM 5/17/71, p. 75-76
- ⁹²WBE in ANO, p. 88
- ⁹³POI, p. 176
- ⁹⁴CRS 3:4 3/67, p. 24
- ⁹⁵SCM:67 12/48, p. 436
- ⁹⁶HLL, p. 524
- ⁹⁷SCA 12/57
- ⁹⁸BRO, p. 212
- ⁹⁹CRE May/June '66, p.
24ff
- ¹⁰⁰BRC, p. 84-87
- ¹⁰¹CST, p. 124
- ¹⁰²CBO, p. 184-185
- ¹⁰³SMI 5:9 12/74, p. 22
- ¹⁰⁴SIM, p. 97
- ¹⁰⁵C45, p. 44
- ¹⁰⁶ESL, p. 299
- ¹⁰⁷CRS 13:4 3/77, p.
185-190
- ¹⁰⁸BRO, p. 203, 212
- ¹⁰⁹C45, p. 19
- ¹¹⁰COR MES-001, 002
- ¹¹¹UNN 10/75 55:11, p. 2
- ¹¹²WEY, p. 225-226
- ¹¹³BRC, p. 105
- ¹¹⁴JVI:67, p. 21
- ¹¹⁵BRO, p. 177
- ¹¹⁶K73, p. 5
- ¹¹⁷ART #14 (1968), p. 2-5
- ¹¹⁸source unknown
- ¹¹⁹ART #14 (1968, p. 4-5
- ¹²⁰CST, p. 123
- ¹²¹HUN, p. 105
- ¹²²VIT, p. 8
- ¹²³PEA, p. 14, 43
- ¹²⁴BRO, p. 268
- ¹²⁵CST, p. 39, 52
- ¹²⁶TIM 3/15/76, p. 76
- ¹²⁷POI, p. 166
- ¹²⁸SMI, 11/73 4:8, p. 10, 75
- ¹²⁹CST, p. 55, 58
- ¹³⁰HKS, p. 19
- ¹³¹HLL, p. 530-531
- ¹³²SCM:67 12/48, p. 439

MECHANICAL DESIGN IN THE HUMAN BODY

DAVID A. KAUFMANN*

Received 31 October, 1980.

In the real world a design logically implies a designer. The human body abounds with both simple and complex parts with intricate designs. The pulley is one of man's most work-saving machines. Thirteen examples of pulleys in the human body, grouped into five classes, are discussed. It is logical to conclude that these complex, mechanical examples did not evolve by consecutive random accidents of unthinking molecules but are the results of the planned thinking and workmanship of a Divine Designer.

When one of my anatomy students who has just comprehended one of the intricate designs in the human body asks me "how did this happen to evolve, my usual reply is "all intricate designs in the human body cannot be explained by gradual mutations over vast periods of time. God must have gotten into the act." Since in the real world, the existence of a watch demands the mind and effort of a watchmaker, likewise the existence of an intricate design in the human body demands the existence of the mind and effort of a brilliant Designer. Complex designs do not come about by random raw material accidentally meeting a random energy system over an everlasting period of time. To put it in collegiate slang "how can nobody make everything?" There must be a Grand Designer behind every grand design.

I like to refer this argument to the field of automotive production. Some autos are better than others because of better designs and quality workmanship. There has to be a "thinking force" behind every designed part. Automobiles are not made by unthinking randomness. Holroyd has stated it succinctly "When changes are made in good designs by accidents, it is practically certain that the designs will be damaged or destroyed."¹

At one time as an immature student of science, I had great admiration for man-controlled secular science. But after over 20 years of scientific experience, I now realize how weak and limited man-devised science is. As far as I am concerned it is very easy to distinguish between man-made and God-made designs. The more you magnify man-made designs, the cruder they appear, but the more you magnify God-made designs the more complex and precise they appear. One of the giants of science has said it so clearly: "it is not to be conceived that mere mechanical causes could give birth to so many regular motions . . . this most beautiful system of the sun, planets and comets, could only proceed from the counsel and dominion of an intelligent and powerful being."²

In a previous article³ I cited some examples of mechanical designs in the human body. In this article I would like to cite some further examples of well-designed pulley systems in the human body that obviously infer the "planned thinking and workmanship" of a Divine Designer. A pulley can be defined as "a wheel, sometimes turning in a block, with a grooved rim in which a rope or chain runs that can raise or lower a weight attached at one end by pulling on the other end." It is one of the simple machines of

mechanics, a subdiscipline of physics. Other simple machines are the lever, the inclined plane, the wheel and axle, the gear, the wedge and the screw. From these simple machines most more complex machines can be devised and built. In general these simple machines either give a resistance force a higher velocity at the expense of an effort force or gain magnitude of effort force at the sacrifice of magnitude of velocity.

There are two basic types of pulley systems. First, the "block and tackle" system which has both fixed and moveable pulleys. In this system, greater magnitude of force is gained at the expense of applying a lesser magnitude of force over a greater distance. Second, pulleys which are used to change the direction of an applied force. Figures 1 and 2 depict two basic types of pulleys devised by "intelligent" man. There are a number of bone-joint structures in the human body which simulate the pulley action of changing the direction of an applied force. In most cases a rounded bony part acts as the pulley wheel, the tendon acts as the cord, the muscular contraction supplies the effort force and the weight of the bone (limb) located at its center of gravity acts as the resistance force.

An anatomical pulley has two mechanical purposes. Some pulleys will completely change the action of a joint. Other pulleys will alter the angle of muscular insertion giving the muscle a mechanical advantage. Figures 3 and 4 demonstrate the difference between a muscle with a small angle of insertion and a muscle with a large angle of insertion.

Classification of Pulleys

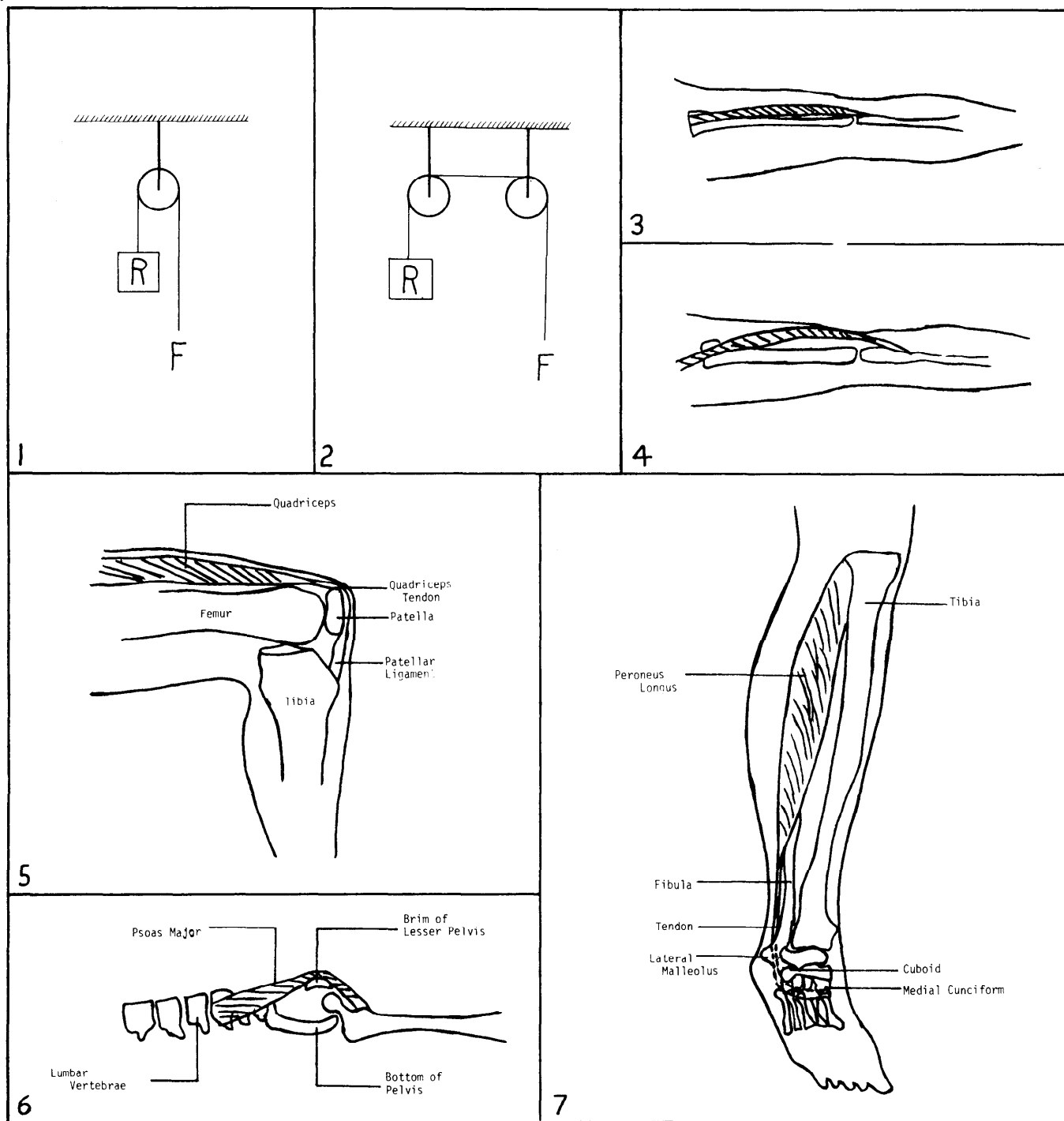
Coleman⁴ has recently grouped pulleys into five classes. These classifications with examples in the human body are clear signs of simple mechanical devices that had to be designed by a Divine Designer.

Class I

In this class an improved joint action results from the muscle tendon passing over an external structure which serves as the pulley wheel.

Example 1: the knee joint is the most obvious example of this (Figure 5). In reality, the patella is not necessary for the quadriceps muscle group to extend the tibia bone. But the patella is necessary to change the angle of insertion of the patellar ligament (which is an extension of the quadriceps tendon) into the tuberosity on the tibia. This hemispheric bone increases the angle of insertion of the patellar ligament which increases the

*David A. Kaufmann, Ph.D., is with the Center for Physical and Motor Fitness, University of Florida, Gainesville, Florida 32611.



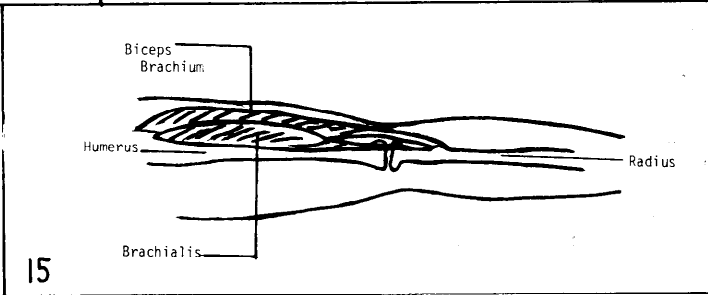
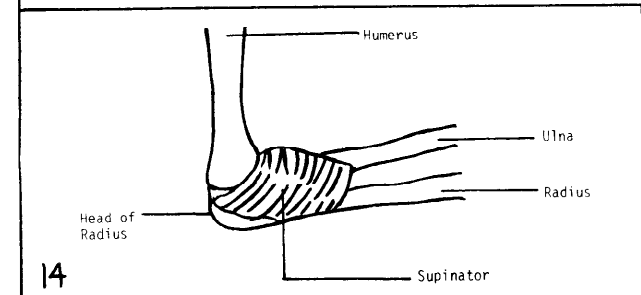
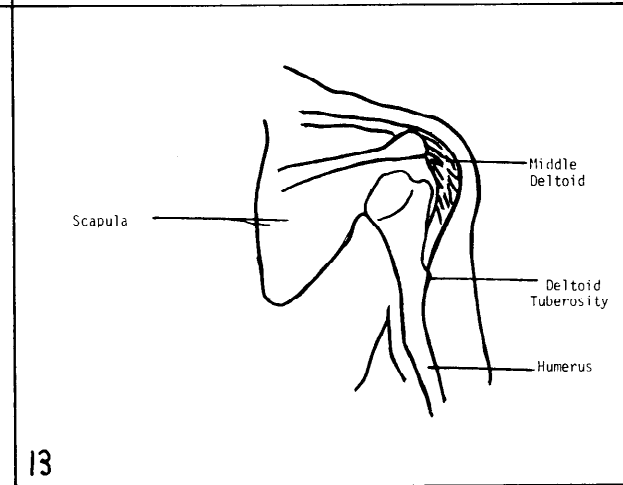
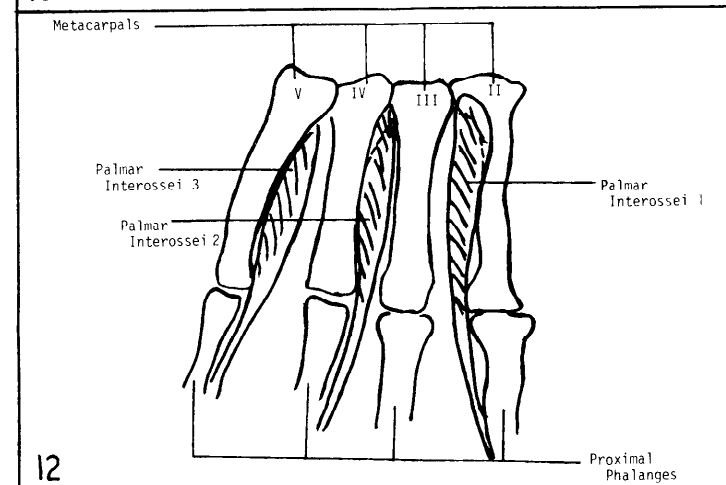
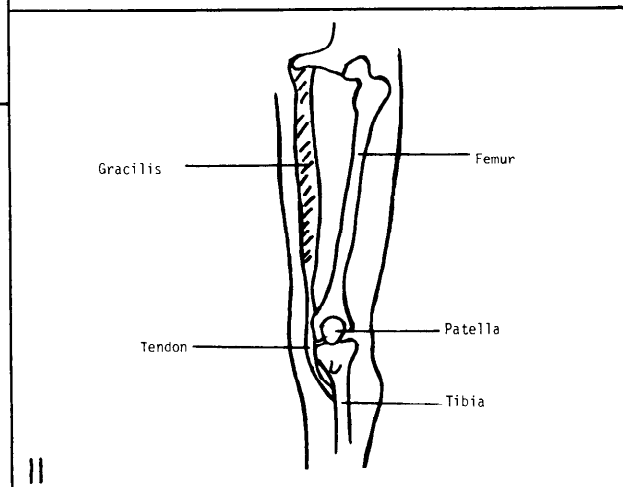
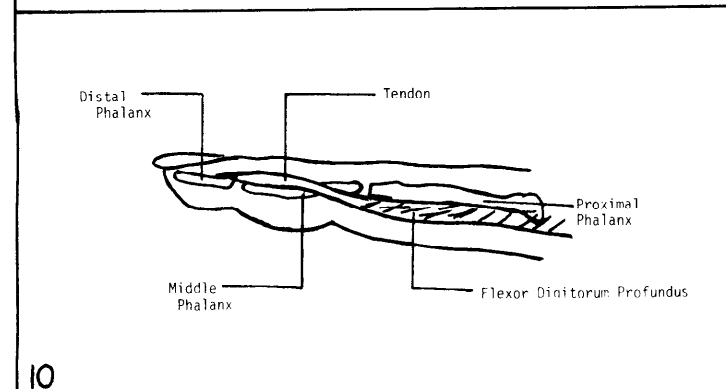
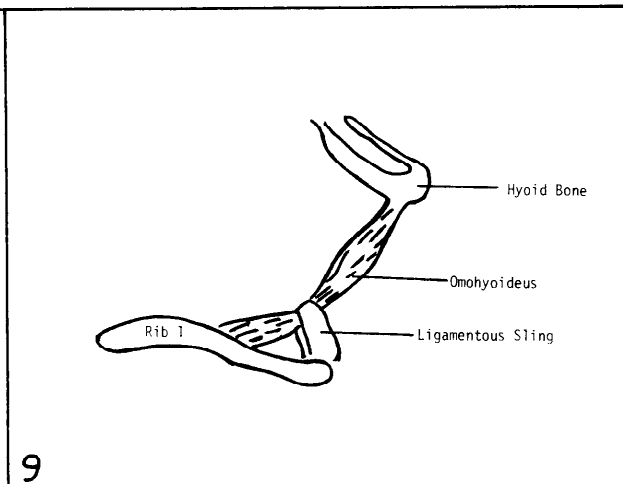
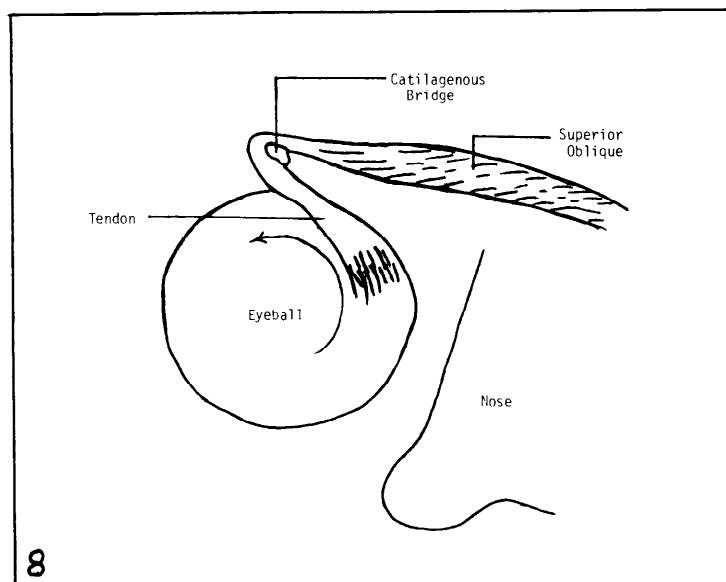
CAPTION FOR THE ILLUSTRATIONS

The various Figures are collected into these two Plates, as follows: 1: Simple Pulley; 2: Double Pulley (Sometimes, however, that term is reserved for arrangements in which one of the pulleys moves); 3: Muscle with Small Angle of Insertion; 4: Muscle with Large Angle of Insertion; 5: Patella Acting as Pulley at the Knee Joint; 6: Brim of Lesser Pelvis Acting as Pulley for Psoas Major; 7: Lateral Malleolus and Cuboid Acting as Double Pulleys for Peroneus Longus; 8: Cartilagenous Trochlea Acting as Pulley for Superior Oblique Muscle of Eye; 9: Ligamentous Sling acting as Pulley for Omohyoid; 10: Distal Interphalangeal Joint Acting as Pulley for Flexor Digitorum Profundus; 11: Epicondyle of Femur Acting as Pulley for Gracilis Tendon; 12: Metacarpophalangeal Joint Acting as Pulley for Palmar Interossei; 13: Shoulder Joint Acting as Pulley for Middle Deltoid; 14: Head of Radius Acting as Pulley for Supinator; 15: Increased Size of Brachialis and Brachium Acting as Pulley for Biceps Brachium.

trigonometric sine relationship which increases the magnitude of the applied force on the tibia.

Example 2: at the hip joint the psoas major muscle passes over the brim of the lesser pelvis (Figure 6). As a

person lies on his back, both the origin on the lumbar vertebrae and the insertion on the lesser trochanter of the femur are posterior to the brim of the lesser pelvis. The elevated brim of the lesser pelvis increases both the



angle of origin and angle of insertion of the psoas major. If the trunk is flexed on the femur or the femur flexed on the trunk, both movements have a greater magnitude of applied force because of this increase in angular pull. This pulley device at the hip joint causes two major kinesiological results. First, if the brim of the lesser pelvis did not improve the angle of pull of the psoas major, this muscle could not be a major hip flexor. Second, the psoas major would not be the main muscular culprit in promoting the prevalent postural disorder, lordosis (hollow back).

Class II Pulleys

In this class the action of the muscle at the joint is altered because of the pulley.

Example 1: Figure 7 depicts the tendon of the peroneus longus muscle proceeding down the lateral calf behind the first pulley, the lateral malleolus of the fibula, curving forward and under the foot, passing along the groove in the second pulley, the cuboid bone, and finally inserting on the lateral side of the medial (first) cuneiform bone. The first pulley causes the applied force to plantar flex the ankle (extending the foot as in pointing the toes), and the second pulley causes the applied force to evert the ankle (as moving the lateral border of the foot away from the midline of the body in a frontal plane). Without these pulleys this muscle would insert in front of the ankle and on top of the foot, and its action would be limited to only dorsiflexion at the ankle joint (moving the instep toward the tibia in a sagittal plane).

Example 2: Figure 8 depicts the action of the superior oblique muscle of the eye. The tendon of this muscle passes over a small cartilagenous bridge called the trochlea (Latin for pulley). This change in angle of pull causes this muscle to rotate the eyeball obliquely.

Example 3: Figure 9 depicts the omohyoid muscle pulling on the hyoid bone, a horseshoe shaped bone in the anterior neck. The pulley is a ligamentous sling which directs the applied force downward rather than backward.

Class III Pulleys

In this class the joint framework serves as the pulley.

Example 1: Figure 10 depicts the flexor digitorum profundus passing over the knuckles of the distal interphalangeal joint. Similarly, the tendon of the gracilis muscle on the medial thigh gains a favorable angle because of the size of the medial epicondyles of the femur (Figure 11).

Example 2: Figure 12 depicts the tendons of the palmar interossei muscles as they pass over the metacarpophalangeal joints. The heads of the metacarpals alter the angle of pull of these muscles causing the applied force to adduct the fingers (pull fingers II, IV and V toward finger III in the frontal plane).

Example 3: Figure 13 depicts the belly of the middle deltoid muscle as it passes over the shoulder joint. The head of the humerus causes an improved angle of insertion on the deltoid tuberosity of the humerus resulting

in abduction of the shoulder joint (lifting the upperarm away from the midline of the body in a frontal plane).

Class IV Pulleys

In this class the muscle wraps around the pulley causing the pulley to rotate. Figure 14 depicts the supinator muscle wrapping around the head of the radius. In this example the pulley action is not to gain a more favorable mechanical advantage, but to cause the pulley to rotate. Mechanical advantage can only be increased here by having a bone with a larger cross sectional area (radius).

Class V Pulleys

In this case the muscle acts as its own pulley. Figure 15 depicts the biceps brachium muscle with the elbow extended. As this muscle increases in size, it not only becomes stronger but the angle of insertion increases slightly. Added to this is the probability that when the brachialis, which is a bulky muscle underneath the biceps brachium, is increased in size and strength, this also will elevate the biceps brachium a little.

Summary

Five classes of pulleys which increase the mechanical actions at certain joints have been discussed. Is it not reasonable to conclude that these advanced, complex devices did not come about by random accidents by unthinking molecules, but are the result of the planned thinking and workmanship of a Divine Designer?

References

- ¹Holroyd, H.B., 1975. Arguments against symmetry and design from chance events. *Creation Research Society Quarterly*, 12 (2): 95-98.
- ²Newton, Sir Isaac, Mathematical principles of natural philosophy: Optics. (in) *Great Books of the Western World*, vol. 34, William Benton, Chicago, 1952. P. 369.
- ³Kaufmann, D.A., 1974. Design in the human body. *Creation Research Society Quarterly*, 11 (2): 91-94.
- ⁴Coleman, J., 1978. The function of anatomical pulleys *Proceedings Kinesiology: A National Conference on Teaching*, ed. by C. Dillman and R. Sears. University of Illinois, Urbana. Pp. 63-73.

QUOTABLE QUOTE

"Just as in the law courts no man can pass judgement who does not listen to the arguments from both parties, so must the person whose task is to study philosophy place himself in a better position to reach a judgement by listening to all the arguments, as if they came from undecided litigants."

St. Thomas Aquinas, in his Exposition of Aristotle's *Metaphysics*.

A RECENT CREATION EXPLANATION OF THE 3° K BACKGROUND BLACK BODY RADIATION

RUSSELL AKRIDGE,* THOMAS BARNES,** and HAROLD S. SLUSHER***

Received 18 November, 1980.

We examine the big-bang explanation of the origin of the 3° K background blackbody radiation over billions of years. We find the big-bang explanation self-contradictory and unrealistic. We propose the Heating Model as an explanation of the origin of the 3° K background radiation consistent with a recent creation.

I. Outline of the Article

The most important evidence for an expanding, billions-of-years-old universe is the 3°K background radiation.¹ The radiation seems to be real. It is a faint "glow" such as a body only 3°K above absolute zero ($= -270^{\circ}\text{C}$) would emit. The radiation comes uniformly from all regions of the sky.

In Section II of this article we explain the currently accepted evolutionary interpretation of the 3°K radiation, called the Standard model. In Section III we show that the predictions of the Standard Model are wrong. We show the Standard Model that claims to explain the origin of the 3°K radiation actually predicts no radiation at all. This model is the Corrected Standard Model. In Section IV we outline the evolutionary model that must be used to harmonize the 3°K radiation with the concept of the expanding universe. The model that must be used requires a perfectly reflecting coating over the entire surface of the expanding universe. We show that this coating around the universe is essential to obtain the equations for the temperature and number of photons in the expanding universe. This model is so absurd, even though it is required by the evolutionary theory, that we call it the Artificial Model. A comparison of evolutionary models is made in Section V. We point out that big bang theorists use one model to explain the expanding universe, but use an entirely different, absurd model to perform the calculations.

We present a creationist explanation of the origin of the 3°K radiation in Section VI. We show the interstellar dust and gas in our galaxy has absorbed enough of our galaxy's own light to raise its temperature from zero to 3°K in the 6,000 years allowed by the literal Biblical creation. It is the 3°K dust and gas that radiates the 3°K radiation. This model is called the Heating Model. In Section VII we show the Heating Model is unique. In Section VIII we conclude that the big bang evolutionary explanation of the expanding universe is self-contradictory and absurd. We conclude that a recently created universe offers the most acceptable explanation of the 3°K background blackbody radiation.

The blackbody radiation formulae used in this article are expressed in terms of the Stefan-Boltzman constant $\sigma = 5.67 \times 10^{-8} \text{ j/m}^2 \cdot \text{sec}^{\circ}\text{K}^4$. The blackbody formulae used in this article are as follows:

- (1) The radiation flux² through a surface of a blackbody at absolute temperature $T^{\circ}\text{K}$ is σT^4 j/sec.m².
- (2) The radiation energy density³ of a blackbody at an absolute temperature $T^{\circ}\text{K}$ is $(4/c) (\sigma T^4)$, where $c = 3 \times 10^8$ m/sec is the speed of light.
- (3) The pressure⁴ exerted by the radiation of a blackbody with absolute temperature $T^{\circ}\text{K}$ is one third of the energy density of the radiation, or $(4/3c) (\sigma T^4)$.

II. The Standard Model

The Standard Model is the name given to the physics that describes the big bang origin of the universe.⁵ The Standard Model asserts that the universe began with all matter and energy concentrated in a relatively small, rapidly expanding sphere. The temperature within the sphere was billions of degrees Kelvin. Within this sphere were particles, antiparticles, radiation, and neutrinos. The matter and radiation freely interacted with one another. Particles and antiparticles interacted to produce photons, and photons interacted to produce particle-antiparticle pairs. Physicists describe an interaction between two states by saying the two states are coupled. The Standard Model describes the beginning as a condition in which radiation was coupled to the rest of the universe. This coupling insured that the temperature of the radiation (i.e. the blackbody temperature) was equal to the thermal temperature of the matter in the universe.

The relatively small, ultra-high temperature sphere exploded, because of the high thermal and blackbody energies. This explosion in the first few seconds of existence of the universe in the Standard Model is the big bang. The temperature of the universe dropped rapidly after the explosion, because the universe was expanding. The temperature of any gas drops under an adiabatic expansion. Within a few seconds the temperature was cool enough (a few billion degrees Kelvin) that photons could no longer produce particle-antiparticle pairs. The low-temperature photons no longer had sufficient energy to create the rest mass necessary for the lightest particles, the electrons and positrons. Within a few more seconds, all of the particle-antiparticle pairs annihilated. These annihilations produce the last of the high temperature photons.

After the big bang, interactions between high temperature radiation and matter ceased. Whatever high temperature radiation was there, was all there would ever be. As far as the high temperature photons

*Russell Adkridge, Ph.D., is at the Westminster Schools, 1424 W. Paces Ferry Rd., N.E., Atlanta, Georgia

**Thomas Barnes, Sc.D., is with the Department of Physics, University of Texas, El Paso, Texas 79968

***Harold S. Slusher, D.Sc., is with the Department of Physics, University of Texas, El Paso.

were concerned, the matter in the universe had suddenly become transparent; there was no mechanism for photon-matter interactions. Physicists describe this absence of photon-matter interactions by saying the photons were decoupled from the rest of the universe. From this time on, the Standard Model asserts that the photons expanded freely with ever decreasing photon temperature (blackbody temperature) quite different from the temperature of the matter in the rest of the expanding universe. The temperature T of this background photon radiation decreased as the universe expanded. The Standard Model equations yield⁶ $T \propto 1/R$. R is the radius of the universe. Over the past 20 billion years, the universe has expanded so much that the temperature of these background photons has decreased to only a few degrees above absolute zero. The Nobel Prize in Physics was awarded to Penzias and Wilson⁷ for experimentally detecting this background radiation in 1965. The detection of the background radiation at the predicted temperature seemed to prove the big bang theory of the origin of the universe.

This article seeks to show the predictions of the Standard Model are wrong. The Standard Model actually should predict there should be *no background radiation at all*. Therefore, the detection of a back-radiation disproves the Standard Model and the big bang theory of the origin of the universe.

III. The Corrected Standard Model

The Standard Model as presented in the last section is consistent with the laws of physics until the point at which the photons and the matter in the expanding universe decouple. When photon-matter interactions cease, the entire universe becomes transparent to photons. What happens to the photons then?

After the decoupling event, the universe is a very simple place for the high temperature photons. The universe is transparent. As far as the photons are concerned, the matter in the universe has vanished. All of these photons would continue to travel in a straight line at the speed of light forever. In a matter of only a few years all of these high temperature photons would have escaped the expanding universe. After that, there would be no background photons at all inside the expanding universe, ever. All of the original photons would be far past the outer boundary of the expanding universe. They would never return. Thus, the *correct* prediction of the Standard Model is that there should be *no* background radiation at all now.

An advocate of the Standard Model might object that the universe is possible infinite. In that event, the original high temperature background photons could not escape from the universe. They should still be inside the universe. The advocate would be correct, but it would do him no good. If the original high temperature photons in an infinite universe were still around, they would still be at the original high temperature of billions of degrees Kelvin. They would have to remain at this high temperature, because they are decoupled from the rest of the universe.

A final attempt to salvage the Standard Model might be to allow some small unknown interaction between

the original high temperature photons and the rest of the universe. Whatever interaction this would be would keep the photon temperature and the temperature of the rest of the universe the same. Allowing interactions with the rest of the universe would result in a background photon temperature that is far in excess of the 3 degree Kelvin temperature that is actually observed.

The correct Standard Model predicts no background radiation at all. How have astrophysicists derived their key equation $T \propto 1/R$ for the temperature of the background radiation and the radius of the expanding universe? This is the equation that predicts the blackbody temperature of the background radiation has decreased to 3° as the radius of the universe has increased to billions of light years. The answer: astrophysical calculations are not done on the Standard Model, but on an artificial model.

IV. The Artificial Model

The Artificial Model is the same as the Standard Model, but with one addition. The inner surface of the expanding spherical universe is completely coated with a perfectly reflecting substance. The background radiation still does not interact with the matter inside the universe. No background radiation ever gets out of the universe. The total number of blackbody photons should remain the same. The total energy of the blackbody radiation remains the same, except for the work done by the radiation on the fictitious reflective coating of the boundary of the universe. These two conservation laws will be examined.

The perfectly reflective coating of the inner boundary of the universe is the artificial part of the model for cosmogony. No one believes that at the boundary of the universe there is a perfectly reflecting substance that completely coats the universe and holds its blackbody energy in.

If the Artificial Model were not expanding, the total blackbody energy ($4 \sigma T^4/c$) ($4\pi R^3/3$) within the universe would remain constant. No photon energy is radiated through the surface, due to the perfectly reflecting internal coating on the surface. No energy is added to or subtracted from the blackbody radiation energy within the universe, because the blackbody radiation and the masses are assumed to be completely decoupled. Therefore, the blackbody radiation temperature T would remain constant.

What happens when the Artificial Model expands? The blackbody radiation energy ($4 \sigma T^4/c$) ($4\pi R^3/3$) would decrease, because the pressure $P = 4\sigma T^4/3c$ of the blackbody radiation does work PdV against the expanding perfectly reflecting surface. The work done is $(4\sigma T^4/3c)d(4\pi R^3/3) = (16\pi\sigma T^4 R^2/c)dR$.

This energy equation has for initial temperature T_i and initial radius R_i , the solution $T = (T_i R_i)/R$. Blackbody temperature is inversely proportional to the radius of the expanding reflectively coated universe. This proportionality is claimed to be a prediction of the Standard Model. Actually, it is the prediction of the Artificial Model.

A curious feature of the artificial model is its conservation of photon number. The Planck distribution law

gives the energy density du for radiation with wavelengths between λ and $\lambda + d\lambda$ as⁸

$$du = \frac{8\pi ch d\lambda}{\lambda^5 (e^{\frac{hc}{\lambda kT}} - 1)} \quad (1)$$

The energy of each photon of wavelength λ is $E = hf = hc/\lambda$. Thus, the number of density dn of photons with wavelength between λ and $\lambda + d\lambda$ is $dn = du/E$, or

$$dn = \frac{8\pi d\lambda}{\lambda^4 (e^{\frac{hc}{\lambda kT}} - 1)} \quad (2)$$

The total number density of photons of all energies is

$$n = \int_{\lambda=0}^{\infty} dn = 8\pi \int_0^{\infty} \frac{d\lambda}{\lambda^4 (e^{\frac{hc}{\lambda kT}} - 1)} \quad (3)$$

When a change of variable is made from λ to the dimensionless parameter $\chi = hc/\lambda kT$,

$$n = 8\pi \left(\frac{kT}{hc} \right)^3 \int_0^{\infty} \frac{x^2 dx}{e^x - 1} \quad (4)$$

The integral can be evaluated numerically to give $n = 60.42198(kT/hc)^3$.³ The numerical factors are not important. The important feature is that the number density of photons is directly proportional to the cube of the absolute blackbody radiation temperature, $n \propto T^3$. As shown above the blackbody temperature T is inversely proportional to the radius of the sphere, so that the number density is inversely proportional to R^3 , or $N = (\text{constant})/V$. Thus, the total number of photons within the spherical universe, $N = nV$, is always constant as the sphere expands.

V. Comparison of Models

The big bang description of the origin of the universe confuses the Standard Model with the Artificial Model. Big bang cosmologists describe the expanding universe as a blackbody radiation field decoupled from and expanding with the matter of the universe. However, the equations used to predict the 3°K background radiation left over from the big bang are equations that fit the Artificial Model of an expanding universe whose outer boundary is completely coated with a perfectly reflecting substance. One model is used to give a convincing physical description, but a very different model is used to derive formulae. The descriptive model should be the same as the computational model. The big bang calculations have been done for the wrong model. The 3°K background radiation, too, is the result of the wrong model, the Artificial Model. There should be *no* 3°K background radiation left over from an expanding universe that starts with a big bang.

VI. The Heating Model

The 3°K background radiation did not come from the big bang. Where did it come from? The 3°K background radiation is produced by absorption and reradiation of starlight by interstellar gas and dust. The following simple model provides some numerical estimates. Our Galaxy consists of stars and dust. The stars are intense sources of radiant energy. The temperature of interstellar dust must slowly increase as the interstellar dust and gas (including individual atoms

and molecules) absorbs a fraction of this stellar energy. The warm interstellar dust of our Galaxy absorbing and reradiating radiation is therefore a blackbody radiator. The temperature T of the blackbody radiation is the same as the temperature of that part of the interstellar dust with which it is in equilibrium. There is no reflecting layer around our galaxy, so the warm interstellar dust and gas will lose some of its energy as it glows (i.e. as it radiates blackbody radiation into intergalactic space).

One should not be misled by descriptive terms like "warm" or "glowing". These terms usually describe objects at or above room temperature, 300°K. The interstellar dust is not really warm in that sense at all. It is only at a temperature of about 3°K. Therefore, it does not glow very much, and the output is mostly not visible light. All of the effects are small. However, all of the effects are real.

Our galaxy can be approximated by a dust cloud in which are imbedded N stars of average luminosity L_{ave} each. Most of the light from each star escapes our galaxy. We know this fact because we can observe other galaxies quite well.

However, the galactic dust absorbs a fraction f of the energy produced by the N stars embedded within the galactic dust. The specific heat of the galactic dust and gas has an average value of c_d . The change in the thermal and blackbody energy associated with the galactic dust $\Delta(c_d M_d T + (4/c)\sigma T^4 V)$ equals the energy absorbed by the galactic dust from the stars in time Δt , which is $N L_{ave} f \Delta t$, minus the blackbody energy radiated into intergalactic space during time Δt which is, $\sigma T^4 A \Delta t$. If V is the volume of the galaxy and A is the surface area of the galaxy, then $(d/dt)(c_d M_d T + (4/c)\sigma T^4 V) = N L_{ave} f - \sigma T^4 A$. This equation can be solved; but two approximation simplify the calculus. As long as the galactic dust and gas is no warmer than a few degrees above absolute zero, the blackbody power σT^4 radiated into intergalactic space is negligible compared to the power $N L_{ave} f$ absorbed from the stars. The gas and dust in interstellar space in our galaxy is so thin that its 3°K blackbody energy is insignificant compared to its 3°K blackbody radiant energy. An order-of-magnitude calculation will make these relative values clear.

There are about 0.25 gas atoms per cm^3 averaged over the plane of the galaxy.⁹ The thermal energy density of these gas atoms would be $(0.25 \times 10^6 \text{ atoms/m}^3)(3/2) (1.38 \times 10^{-23} \text{ J/}^\circ\text{K})(3^\circ\text{K}) = 1.6 \times 10^{-17} \text{ J/m}^3$. They are not all at this low temperature, so the actual 3°K thermal energy density of interstellar gas would be a smaller number. We will use the figure of $1.6 \times 10^{-17} \text{ J/m}^3$, because it will give a conservative estimate.

The energy density of the 3°K blackbody background radiation is found from the Stefan-Boltzmann law to be $(4/c)(\sigma T^4)$ or $(4/3 \times 10^8 \text{ m/sec})(5.67 \times 10^{-8} \text{ J/m}^2 \text{ sec}^\circ\text{K}^4)(3^\circ\text{K})^4$. The background blackbody radiation energy $4\sigma T^4/c$ is several orders of magnitude larger than the thermal energy $3nkT/2$ of the 3°K gas, so the thermal energy of 3°K gas will be neglected.

Interstellar dust is even less of a factor (in energy storing), because it is only 1/100th as abundant by mass as is gas.¹⁰ Thermal energy within the dust at 3°K would

be given by the Debye T^3 law,¹¹ and would be negligible at 3°K.

The energy equation now appears in the approximate form:

$$\frac{d}{dt} \left(\frac{4\sigma T^4 V}{c} \right) = NL_{ave} f \quad (5)$$

The solution with initial temperature T_i is:

$$T = (T_i^4 + \frac{cNL_{ave}ft}{4\sigma V})^{1/4} \quad (6)$$

The time t for the galactic blackbody radiation to rise from T_i to T is $t = (4\sigma V)(T^4 - T_i^4)/(cNL_{ave}f)$. The time t cannot be calculated, because the initial temperature T_i is not known. However, an upper limit can be calculated. The maximum time t_{max} for the galactic blackbody radiation to increase to temperature T is the time to heat from zero initial temperature, or $t_{max} = (4\sigma VT^4)/(cNL_{ave}f)$. This expression provides an upper limit for the age of our galaxy. The interstellar dust and gas in the vicinity of the galactic equator attenuates visible light at about one order of magnitude per kiloparsec.¹² This means that visible light is attenuated by a factor of $10^{0.4} - 1$ or 1.5 in a distance of 3,200 light years by interstellar absorption. The galactic disk is only 1/4th of a kilo-parsec thick from its center to its top or bottom. The total visible attenuation occurring within the disk would be a factor of $10^{0.1} - 1$ or 0.26 or 26% if all of the stars of the galaxy were in the galactic plane. Many of the stars of the galaxy do not lie in the galactic plane. A larger fraction of the light from those stars escapes the galaxy, because it passes through less interstellar dust and gas. We will use a figure of 0.20 or 20% for f , the average fraction of the galaxy's luminosity absorbed by our own galaxy.

Our star, the sun, has a nearest neighbor, Alpha Centauri, at a distance of 4.40×10^{16} meters (approximately four light years). Thus for our sun, $V/NL_{ave} = (4\pi/3)(4.04 \times 10^{16})^3/(1 \times 3.9 \times 10^{26}) = 7.1 \times 10^{23} \text{ m}^3 \text{ sec/j}$. Our sun is a typical star, so the value of V/NL_{ave} for the entire galaxy should be approximately the same, $7.1 \times 10^{23} \text{ m}^3 \text{ j}$. The maximum age of our galaxy is then $t_{max} = (4\sigma VT^4)/(cfNL_{ave})$. When the numbers mentioned above are inserted, this gives for $t_{max} 2.1 \times 10^{11}$ seconds = 6,800 years. In view of the order of magnitude approximations made, the time 6,800 years must be considered only as an order of magnitude estimate to the actual age of the galaxy. We are dealing with maximum time here. Therefore, the result is that an upper limit for the age of the universe is roughly ten thousand years. That is the time required for the background blackbody radiation to heat from zero to its observed value of 3°K.

VII. Uniqueness

Is there any way to decide whether a 3°K blackbody radiation spectrum has come from an expanded high

temperature radiation or from the heating of a substance from zero to 3°? Yes, there are two ways. The first test is valid in principle, but impossible in practice, because of the time required. An expanding contained radiation field at 3°K is *decreasing* in temperature. A 3°K heated dusted is *increasing* in temperature. If one could wait for thousands or millions of years, he could see if the radiation temperature increased or decreased. Then he would know the cause of the 3° radiation.

The second test is a practical one. It is a known fact that there is dust absorbing a fraction of the galaxy's light. Therefore, this dust must be heating up. If the galaxy really is billions of years old, our galaxy's dust would be pretty hot by now, approximately 100°K. It would emit a 100°K blackbody radiation spectrum many orders of magnitude more intense than a 3°K blackbody spectrum. The 100° spectrum certainly would be there. If the 3°K radiation is a left over from the big bang, say, 10 billion years ago, then the galaxy would contain two superimposed blackbody spectra. The spectrum from the big bang would be centered at 3°K, and the spectrum from galactic dust heating would be centered at 100°K.

Since there is only one measured blackbody spectrum as far as we know, and since galactic gas and dust heating does occur, the one spectrum must be due to galactic dust and gas—the spectrum consistent with a recent creation.

VIII. Conclusions

A recently created universe offers the most reasonable and consistent explanation of the origin of the 3°K background radiation. The evolutionary big bang models used to explain the 3°K background radiation are self-contradictory. They involve unrealistic assumptions.

References

- ¹Silk, Joseph, 1980. The big bang. W.H. Freeman, San Francisco. P. 75.
- ²Kittel, Charles, and Herbert Kroemer, 1980. Thermal physics. W.H. Freeman, San Francisco. P. 96.
- ³*Ibid.*
- ⁴Panofsky, Wolfgang K.H., and Melbo Phillips, 1962. Classical electricity and magnetism. Addison-Wesley. P. 193.
- ⁵Weinberg, Steven, 1977. The first three minutes. Basic Books, New York. P. 4.
- ⁶*Ibid.*, appendices.
- ⁷Shipman, Harry L., 1978. The restless universe. Houghton Mifflin, Boston. Pp. 393 *et seq.*
- ⁸Reference 2, p. 94.
- ⁹Swihart, Thomas L., 1978. Journey through the universe. Houghton Mifflin, Boston. P. 193.
- ¹⁰*Ibid.*
- ¹¹Reference 2, p. 106.
- ¹²Unsold, Albrecht, 1969. The new cosmos. Springer-Verlag, New York. P. 246.

INTELLIGENCE RATHER THAN STRUGGLE†

WILLIAM J. TINKLE*

Received 16 December, 1980.

Frederick Nymeyer, a typical humanist, has written: "The most obvious answer, and to most people the most acceptable answer after long reflection, is that Dust is God. By Dust is meant all the physical elements in the universe. Such a view holds that there is nothing transcendent above the material. There is no super-God; that idea is a figment."¹

A Century-old Revolution

Divine creation was accepted by the vast majority of people up until about a hundred years ago, although a century and a half earlier it had been challenged by a few rebellious thinkers whose ideas gained but limited acceptance. Most of the people gave the credit to God as illustrated by the following quotation.

Robert Boyle (1627-1697) was a great scientist . . . and carried out many significant experiments of value to those who followed. . . . Moreover Boyle was equally interested in science and theology and therefore programmatically tried to do justice to both. He affirmed only that the religious affirmations were paramount for the meaning of life, and that in this sense, the scientific must find its proper place in relation to religion. For Boyle did not mean that science was of secondary importance. His scheme of things expressed the subserviency of science to theology; but this was not with respect to the method or attainments of science.

It had to do only with a total understanding of life.²

The understanding and faith of this great scientist should be appreciated and taught.

Some persons have entertained the thought that the world is eternal and thus had no beginning. Such a claim is easily disproved, by the unstable elements, which break down of themselves into other substances. For instance uranium, used in making atomic bombs, breaks down through a series of elements until the end result is helium and lead. If the world were infinitely old—were without beginning—all the uranium in the world would have disintegrated into helium and lead. The fact uranium still is available proves that the world came into being at some point in time—that the world had a beginning.

Various vagaries have been proposed about beginnings; but most of them gave credit to God up until about a hundred years ago. At that time the study of material things was very fashionable. Some scientists, leaving the example of Boyle, Kepler, and Newton, who were true Christians, alleged that nothing but matter and motion exists. But all about them were living things

of great complexity and of various structures and it was hard to ascribe to them an origin other than the intelligent planning of God.

Charles Darwin (1809-1882) after twenty years of pondering under material influence, came up with a different plan to account for life. He postulated that simple kinds of plants and animals might become not only more complex through chance changes but also better organized. He assumed that such changes would make these creatures better fitted to survive in the struggle for existence and that favorable changes would accumulate until simple cells would change into the oaks and sequoias, the elephants and eagles of the present day.

It is true that at the end of the Second edition of the *Origin of Species* (2nd. Ed.) Darwin suggested that God may have created one or a few simple kinds to start life. But the idea of divine creation was not popular with Darwin's confederates such as Ernst Haeckel, Herbert Spencer, and Thomas H. Huxley; and the evolution movement soon heralded the triumph of materialistic forces with no need for God. Furthermore, Darwin did not repeat the suggestion of creation in later editions of the *Origin of Species*.

Theistic Evolution

The modern Christian may read the interpretation of life given by those who think nothing is real except matter and motion, and then say: "I cannot agree with such accounting for life. No doubt the scientists have the facts; they work in that field; but I believe God guided the whole process of evolution."

Such a person is to be commended in a way; for it takes courage to rebel at all against recognized authorities who say that all informed persons agree with them. But such a modern Christian does not go far enough in his protest. He assumes that the evolutionist not only has facts but he also has interpreted them correctly. He needs to look into the facts for himself. He may object that he cannot understand the big words of zoology and botany books; but there are simpler articles, for instance in this *Quarterly*.

This line of reasoning is called theistic evolution and it is deceptively alluring to many people; it may seem to be a protest but it actually is a compromise, and it goes more than half-way toward a full-orbed evolution and denies part of God's word. There is no reason why one should doubt the power of God.

It has been said that science and religion are like trains on parallel tracks; they cannot collide. This may be true to an extent; but if one studies far in science he meets a world view of some kind, which may be true or may be false. Such a view may be classed as a philosophy rather than a science; but it is met, and we all know it is of vast importance.

*William J. Tinkle, Ph.D., taught Biology and Genetics for many years. He is now retired, and lives at Timbercrest Home, North Manchester, Indiana 46962.

†This article is adapted, in part, from Dr. Tinkle's book *God's Method in Creation*, published by The Craig Press, 1973.

(Continued on page 167)

HAVE THE GENESIS KINDS EVER CROSSED?

FRANK LEWIS MARSH*

Received 30 October, 1980

Among special creationists today it is generally believed that basic types of organisms cannot now cross. About the past, two schools of thought exist. One holds that in the past some crossing probably occurred nearer creation week when the stocks were more "viable" and "virile" than now. The other school holds that crossing of basic types never occurred, and that our modern basic kinds have, with more or less internal variation, kept their general characteristics ever since creation week.

Attention is called to the opinion of geneticists, based upon laboratory findings, that crossing of basic types has never taken place. Each basic type is visibly distinguished by its unique morphology, and the morphology of every organism is in turn determined by the specific sequence of the same two pairs of nucleotides in the DNA of the chromosomes. Dobzhansky, Lagerkvist, and Levine are quoted on this point.

The unique sequence of the nucleotides in an organism's DNA determines the chemistry in its cells. Hybridization can occur only between individuals in which the chemistries of the body cells are quite similar. Such similarity occurs only among the members of the same Genesis kind.

These discoveries of geneticists have shown that "viability" and "virility" have had nothing to do with the crossability of basic types of organisms.

Because crossability rests wholly upon chemical compatibility (close similarity), and because such compatibility does not exist between the members of different basic types of organisms, it follows that two different basic types have never crossed. There is no known case in which two morphologically different individuals have produced a hybrid.

Crossing of variants within a single basic type may result in improved stocks, and again it may result in something undesirable, such as the development of poisonous substances in the hybrid. Monkshood and guayule are cited.

Because of their amenability to laboratory proof, in the study of origins two vitally important biological principles or laws are (1) Basic types (Genesis kinds, baramins) cannot cross; and (2) The Law of Limitation of Variation (Processes of variation can go no further than to produce additional variants with already existing basic types). Organic evolution and these two biological laws cannot exist on the same planet at the same time.

The State of the Question

The man in the street today, and even some modern scientists, are still influenced (perhaps unconsciously) by a belief prevalent during the Dark Ages that if sexual intercourse were mechanically possible, almost any kind of animal could and at times did cross (produce viable offspring) with other basic types.

The testimony of modern geneticists regarding the crossability of man with other mammals is unanimous and is clearly summarized by geneticist E.C. Colin in the following statement: "In ancient times various superstitious beliefs grew up around double monsters; some people even maintained that they were the hybrid offspring of man with some other mammal. As a matter of fact, there is no evidence of the origin of a hybrid between man and any other mammal."¹ The same might be said about other different kinds. But what about the past?

Getting down to basics, was past hybridization potential ever greater than it is today? Is the present impossibility of hybridization between basic types (such as dog and cat, horse and cow, man and chimpanzee) due to a lessening of original "virility" and/or "vitality"?

Genesis 1 and 2 make it appear that before the creative act the Creator had a plan in mind by which all living organisms were to be brought into being in separate populations (in a hierarchy of kinds?). The earth was commanded to bring forth these clusters of like individuals (kinds) (Gen. 1:11, 20, 24, 26), and the record is that the earth obediently and promptly

brought forth these groups (Gen. 1:12, 21, 25, 27). Man, of course, had special treatment. Furthermore, not only did organisms appear as kinds but also with regard to plants it is recorded that they were "yielding seed according to their own kinds (Gen. 1:12 RSV)." Modern science testifies that the same is true of animals. Only if the morphology of two individual plants or animals is closely similar are fertile offspring possible.

The Genetic Code

In recent years science (genetics and molecular biology) has progressed a long way in the understanding of heredity (with particular attention on the hereditary substance, DNA), and associated discontinuity (gaps between types) among living things. Theodosius Dobzhansky wrote: "The diversity of living things is evidently based not on the proportion but on the arrangements of the genetic 'letters'.² Writes Lagerkvist (1980): "The genetic code, as we know it today, is a highly degenerate (i.e., not in the sense of the second law but in a chemical sense,—all amino acids have more than one codon) code made up of 64 three-letter codons in which four nucleotides—containing the bases thymine (T) (uracil in RNA), cytosine (C), adenine (A), and guanine (G), respectively—are used."³ Writes Levine: "Diversity of genetic information is found in DNA as the only letters in an alphabet for a code or language that depends upon the *sequence* of pairs of A-U and G-C nucleotides."⁴

It is almost an overwhelming concept that *different arrangements* of only two pairs (the same two pairs for all organisms) of countless nucleotides in a linear sequence within each individual of a cluster of

*Frank Lewis Marsh, M.S., Ph.D., is Emeritus Professor of Biology at Andrews University. His address is 216 Hillcrest Drive, Berrien Springs, Michigan 49103.

chromosomes determines the chemical stage setting which produces a man or a mouse. This specific internal chemistry orders the detailed morphology of each individual. It would appear that this individualistic chemical picture of each basic type was established at creation, and has determined that down to our day dogs can reproduce only with dogs, and cats only with cats.

The simplicity with complexity in the plan is profound, and reveals in the resulting cosmos the handiwork of an omniscient Creator Who is an Honest Workman. As we study the natural world in an endeavor to follow the thoughts of God after Him, our gaping wonder becomes rational worship.

Virility and Vitality are not in Question

It is important that we observe that it is the *specific sequence* of the nucleotides, and *not* the greater or lesser *virility* and/or *viability* of the entire organism which determines the chemistry in the cells composing the individual. Individuals of the same basic type of organism obviously have closely similar nucleotide sequences, and consequently similar chemistry in their sex cells. Such chemically compatible sex cells can achieve true fertilization followed by normal development to an adult F₂ which in turn will be chemically similar to its parental basic type. Sex cells from individuals which belong to *different* basic morphological types (Genesis kinds) are chemically incompatible and consequently cannot unit in true fertilization or produce viable zygotes.

Greater or lesser "virility" and/or "vitality" could never change the linear order of the nucleotides, and therefore would never have any effect on the crossability of two different basic (Genesis) types. *Degrees of "virility" and "vitality" have nothing to do with the linear order of the nucleotides in the DNA.* For instance, Abraham had six sons by his second wife Keturah (Gen. 25:1, 2) after he was about 140 years old—an example of great *vitality* and *virility*. But Abraham could not form a hybrid with a different basic type, any more than any other man could.

It seems reasonable to conclude that at Creation Week all individuals of any given Genesis kind had the same nucleotide sequence in the DNA. The members of each Genesis kind, because of the chemical compatibility of their sex cells, could breed freely together, "yielding seed according to their own kind" (Gen. 1:12 RSV). This would be true irrespective of the vitality of the individuals.

A second strong argument for absence of hybridization (amalgamation) of basic types before Noah's flood is furnished by the fossil record of antediluvian organisms. Among those fossils an impressive fact is the presence of discontinuity between basic types. Commenting on this phenomenon George Gaylord Simpson said: "The facts are that many species and genera, indeed the majority, do appear suddenly in the fossil record, differing sharply and in many ways from earlier groups, and that this appearance of discontinuity becomes more common the higher the level, until it is virtually universal as regards orders and all higher steps . . . The face of the record thus does really suggest

discontinuity at all levels . . ."⁵ If crossing of Genesis kinds had been a *chief* factor among reasons for the Flood, as some have suggested, certainly this existing, clear-cut discontinuity between types would not exist among the fossil remains of the antediluvian organisms.

Antediluvian Crossing Within Kinds

In Genesis 6:7, 12 it is recorded that (apparently in somewhat over a millenium and a half after creation) "man and beast" had followed a way of living which caused the Lord to be "sorry" that He had made them. ". . . all flesh had corrupted their way upon the earth," and God "determined to make an end of all flesh." We are told in some detail how man had sinned, but what had the animals done to deserve destruction?

In studying this problem we do well to bear in mind the thought that it may be innocent to speculate beyond what God's word has revealed, if our hypotheses do not contradict facts found in the Scriptures. It is also required of Bible-believing scientists that they keep in mind what careful laboratory research has revealed to be true in the natural world.

Laboratory research has shown that *without exception* basic types of organisms (morphologically different populations of plants and animals) cannot hybridize. We may therefore speculate that before the Flood if crossing occurred then cross-fertile races, breeds, or varieties must have been present within the basic (Genesis) kinds. We may assume therefore that in the Edenic state the Creator produced varieties within some kinds. The varieties were possibly distributed in a mosaic pattern over the surface of the earth. In the settled Edenic climate these geographically scattered (but reproductively cross-fertile) populations would not meet. However, the fact that God gave Adam and Eve "coats of skins" (Gen. 3:21) soon after they sinned suggests climatic changes. Under such changes it is possible that organisms would wander, and upon meeting "related" forms, hybridize. Among animals such a basic type may be illustrated today by the rabbits, cottontails, jack rabbits, marsh rabbits, snowshoe rabbits, and Arctic hares. Each breed prefers a different habitat from the other breeds, but they are all cross-fertile.

We may assume that for some very good reason the omniscient Creator did not intend that varieties of a basic kind should cross—or at least not *some* varieties within *some* basic types. If that were true we may catch a glimpse of the reason in the following interesting statement. May I quote Ellen G. White, who in 1899 in a remarkable anticipation of modern discoveries, wrote: "Not one poisonous plant was placed in the Lord's great garden, but after Adam sinned, poisonous herbs sprang up . . . All tares are sown by the evil one. Every noxious herb is of his sowing, and by his ingenious methods of amalgamation he has corrupted the earth with tares."⁶

In Gen. 6:12 we read: "And God saw the earth, and behold, it was corrupt; for all flesh had corrupted their way upon the earth." We know this corruption could not be produced by the crossing of basic kinds, but could it not be true that particular hybridizations between certain races, breeds, and varieties *within* kinds

was the cause? Whether the cross was a blessing or a curse would be judged by the results. Possibly Satan knew how to predict good results and bad results.

Hybrids—Good and Bad

It is common knowledge that today the very best among our domesticated plants and animals have been developed by hybridization. Everything in our beautiful and productive gardens is hybrid this and hybrid that. It may not be common knowledge that through the years many more inferior breeds and even definitely undesirable hybrids than desirable have resulted from the numberless experiments in crossing (amalgamating) variants within a single basic type. These undesirable results have been catalogued—and then destroyed.

Interestingly, today the fact is quite well known among plant scientists that offspring (the hybrids) of normal, nonpoisonous strains of the same basic type may contain poisonous substances in their tissues. One illustration is the fact that two nonpoisonous strains of the garden flower Monkshood (*Aconitum*) when crossed will produce a hybrid which contains the extremely poisonous cardiac and respiratory sedative aconite in its juices.

A recent second illustration is recorded in *Science*, 1979. We read: "Two scientists at ANS (Academy of Natural Science, Philadelphia), however, say that careless hybridization of guayule (*Parthenium*, a shrubby herb of northern Mexico and adjacent Texas from which rubber can be obtained) with any of the plant's relatives is likely to introduce plant toxins that produce severe skin rash in humans. The problem . . . is that people have been looking only at the rubber these plants produce, not at their potentially toxic side effects when hybridized."⁷

Animals likewise suffer pronounced changes in temperament in certain crosses within basic types as revealed today in the hybridization with basic kinds of domesticated animals exemplified by certain unfriendly (to man) strains of honey bees, cats, laboratory rats, cattle, and horses (horse $\times$ zebra). The devil (we assume) can develop undesirable and dangerous varieties of plants and animals just as surely as the plant and stock breeders develop improved stocks.

The antediluvian corruption of the earth was probably abetted by the departure of man from the vegetarian diet that was assigned to him in Eden (Gen. 1:29). The antediluvian bestial corruption of the earth was likewise intensified by some animals leaving their assigned vegetarian diet (Gen. 1:30) and becoming carnivores. We would infer this from the fact that when Noah and the animals left the ark God told him (Gen. 9:2) that "the fear of you and the dread of you shall be upon every beast of the earth . . ." This would suggest to us that many vegetarians had become dangerous carnivores. It seems possible that some changes in diet may have occurred as, under assumed changes in climate animals wandered from their original homes and concomitantly from original foods.

In 1979 the American Dairy Council stated: "The impact of nutrition relevant to behavior ranges from biochemical and structural changes in the central ner-

vous system to psychological changes."⁸ However, whatever the contributing factors were that caused the corruption among man and beast which made the destruction of the antediluvian world necessary, we can be assured that crossing of basic types was not one of them.

Conclusion

In connection with the problem of the Genesis kinds of organisms, there are among special creationists two points of view regarding the crossability of kinds: (1) At times in the past, particularly during the antediluvian period, it was possible for basic types to cross and produce viable offspring; and (2) At no time, from Creation Week to our day, has it been possible for Genesis kinds to cross.

Opinion No. 1 has been nourished and supported by

- (a) The belief held during the superstitious Dark Ages that crossing of basic types could at times occur if intercourse was mechanically possible.
- (b) The belief that greater "vitality" and "virility" in man and beast in earlier days would make crossing of kinds possible.
- (c) The belief that the appearance of the fossil archaopteryx (bird-reptile), or the wildebeest (horse-antelope), of the platypus (mole-bird), etc., might be due to a cross of two basic types.
- (d) The belief that the occurrence of sexual intercourse of man with beast in connection with certain Middle Eastern worship of images and rites of fertility, or otherwise, gave opportunity for production of man-beast hybrids.
- (e) A lackadaisical (listless), laissez faire (not really concerned) attitude today about the study of the original Genesis kinds.

Opinion No. 2, the opinion that at no time in the past or present has it been possible for basic types to cross, has the full support of all pertinent laboratory data and common experience. In not even one case has hybridization (cohabitation is *not* hybridization) been known, much experimental work notwithstanding, where sexual partners were sufficiently different, morphologically, to constitute two different basic types. With this "without exception" substantiation, the hypothesis of "basic types cannot cross" moves up to the level of a natural law or principle. It is as true and equally binding as the biological law or principle of "Life only from life;" of the chemical principle of "Periodic Table which states that 'the properties of the elements are periodic functions of their atomic numbers;' " or as the physical law or principle of "Universal Gravitation."

We have noticed that Gen. 1:12 RSV states that at close of Day Three of Creation Week as plants reproduced they were "yielding seed according to their own kind." If one basic type could successfully cross with another basic kind neither would bring forth after its own kind.

The animals of Day Six also were made after God's plan. Because they were likewise made after their kinds, we reasonably may infer they also so reproduced, and ever since science has kept records no exception has been found to this primal biological law. It would be a

strange act of an all-wise Creator if He were to go to the great care of bringing the hundreds of thousands of unique basic types into existence but make them physiologically capable of crossing with one another and thus quite immediately confuse the original beautiful order and pattern His handiwork had produced.

Confusion did come eventually but how pleasing to think that our modern basic types are essentially the same as they were in the original creation—even though the populations today may show within their respective kinds considerable limited variation from the original patterns. For example, originally one man-pair was created. Today men occur in at least 160 distinct breeds.⁹ But they are still *all man*. Acts 17:26 RSV: “And he made from one every nation of men to live on all the face of the earth . . .”

Some of my creationist friends have said that I am a “uniformitarian”.¹⁰ They must be joking, except that philosophically I do believe our world is subject to law. I do sincerely believe in the uniformity of nature—the regularity of nature according to which “identical antecedent states or causes are uniformly followed by identical effects.” That is a requirement in a cosmos. It is a requirement in God’s great Universe. They say of me that I have a “firm belief in the reality and integrity of the ‘created kind’.”¹¹ That is exactly correct. What kind of a natural world would we have if basic processes were this way a little while then that way? That sounds like a chaos to me.

Before Creation Week apparently God had a plan for animate nature already in mind—different kinds, obviously arranged in a hierarchy (unique groups classified in ranks or orders). He spoke this plan into existence as a law or principle; and the record states that the plant groups immediately began to reproduce according to their own kinds (Gen. 1:12 RSV). Both plant and animal types still follow that plan today according to “natural law” (God’s power manifested in natural ways). The result is not an uninhabitable, lawless chaos but instead a beautiful and wonderfully habitable law-bound cosmos.

I vividly recall a letter received in 1945 from the late Theodosius Dobzhansky in which he said: “You speak of a creation of basic types in a beginning; of a continuation of those kinds to the present time; and of an impossibility of these kinds to cross. Now you should

either point out these kinds in nature, or keep still about them.” The evidence for special creation which Dobzhansky rightfully demanded is actually spread clearly before our eyes today. (See Marsh’s 1976 discussion of the baramin, the causes of variation, and the natural Law of Limitation of Variation.¹¹)

When the special creationist bestirs himself and observes (a) that basic types cannot cross, and (b) that there are natural limitations to how far variation can go, he will find in his hands the very material necessary to demonstrate the invalidity of the evolutionist hypothesis. The beautifully satisfactory part of this situation is that this double roadblock to organic evolutionism consists wholly of coercive, demonstrable natural facts.

References

- ¹Colin, E.C. 1946. Elements of genetics. Blakiston, Philadelphia. Pp. 222, 223.
- ²Dobzhansky, Theodosius. 1970. Genetics of the evolutionary process. Columbia University Press, New York, N.Y. P. 17.
- ³Lagerkvist, Ulf. 1980. Codon misreading: Restriction operative in the evolution of the genetic code. *American Scientist*, 68 (2): 192-198.
- ⁴Levine, Robert Paul. 1968. Genetics, 2nd Edition. Holt, Rinehart and Winston, Inc. New York, N.Y. P. 28
- ⁵Simpson, George Gaylord. 1944. Tempo and mode in evolution. Columbia University Press. New York, N.Y. P. 99.
- ⁶White, Ellen G. 1958. Selected messages, Book Two. Review and Herald Publishing Assn., Washington, D.C. p. 288.
- ⁷Mears, James. 1979 (Quoted in) U.S. rubber shrub may have hidden thorn. *Science* 205 (4406):564.
- ⁸American Dairy Council. 1979. *Dairy Council Digest*, Vol. 50, No. 5, September-October. Nutrition and behavior. P. 1.
- ⁹Taylor, Griffith, 1926. Environment and race. London: Oxford University.
- ¹⁰Coffin, Harold. 1980. Created kind or limitless change: Marsh versus Darwin. *Andrews University Record*. Andrews University, Berrien Springs, Mich. Vol. 1, p. 6.
- ¹¹Marsh, Frank L., 1976. Variation and fixity in nature. Creation Research Society Books, 50933 Williamsport Drive, Norcross, Georgia 30071. (Originally published by Pacific Press Publishing Association.)

Intelligence Rather Than Struggle

(Continued from page 163)

A New Day

Some sixty years ago creationists were saying; “It is better to know the Rock of Ages than to know the ages of the rocks.” This is true; but it seems to say that we have to choose between science and religion when we can choose both if we do it wisely. We live in a day when true science is published in many places. Thus we should study rather than become captives of status seeking, of the Zeitgeist, or of keeping up with the Joneses.

When we consider the complexity of living things and the remarkable way in which the world fits their needs it is evident that chance and struggle do not account for the harmony. We must give the credit to Intelligence.

References

- ¹Nymeyer, Frederick, 1964. Minimal religion. Libertarian Press. P.4.
- ²Dillenberger, John, 1960. Protestant thought and natural science. Doubleday. Pp. 112 et seq..

THE ANNUAL IS ALIVE AND WELL

There have been inquiries as to what has become of the Annual issue of the *Quarterly*. The fact is, that for a long time we have considered the June *Quarterly* as the Annual, and still do. That issue used to have “Annual Issue”, or words to that effect, on the front; but for two or three years now that has been omitted. Maybe it was hard to fit the words in with the picture which was used; maybe they were just overlooked. Anyway, as remarked, we still consider the June issue the Annual; and we shall try to put something to that effect onto it in the future.

IMPLICATIONS OF PALAEOLITHIC STRATIGRAPHY FOR CREATIONIST MODELS OF PREHISTORY

KEN GUENTER*

Received 24 October, 1980

Creationist models of world prehistory are usually enriched by geological considerations and are integrated with biology and anthropology. Claims concerning radiometric dating have been qualified or challenged. However, the archaeological data from before the Neolithic have hardly been noticed. In this article are outlined some of those data, and some implications for Creationist models.

1. The Continuous Sequence of the Flint Typology

All indications lead us to believe that there is an unbroken typology of flint tools that covers the entire Palaeolithic into the Neolithic and is then joined by pottery types which carry the sequence on to clearly historic times. Therefore, the Flood must have occurred prior to the Palaeolithic as there is no indication of any serious interruption.

The typological development of flint tools in the Palaeolithic of Palestine and much of the Near East follows several stages. In the earliest levels there are simple core tools and an assortment of crude flakes that have been reworked. The manufacture of tools on cores as choppers, picks or hand-axes carries on throughout the Lower Palaeolithic, first in the open camps and then in the earliest cave deposits.

The Middle Palaeolithic is dominated by more sophisticated flakes whose basic shape was determined before they were removed from the cores. These flakes are designated as Levallois flakes.

The Upper Palaeolithic is characterized by the proliferation of flint blades which were finished into an assortment of tools such as knives, points and scrapers.

These are only the dominant features of the typology in Palestine. Another dozen or so stages have been accepted as subdivisions of these three major phases.¹

Now the point that must be reckoned with is that these stages are consecutive rather than parallel. The evidence is best illustrated at three major Paleolithic sites, Mt. Carmel,² Jabrud,³ and the Judean caves in the wadis south east of Bethlehem.⁴ In each case we find an essentially similar typology represented and deposited under controlled conditions. At Mt. Carmel there were three caves side by side. The large Tabun cave was first occupied and filled. Then in turn each of the neighboring caves were filled. The same is true of the three rock shelters at Jabrud and the seven caves in Judaea. Never is the same typology found at more than one cave in each of the locations. In other words, a single population at each location seems to have filled a succession of caves, leaving behind three similar typologies.

2. The Parallel Development of Technique

Not only is there a typological sequence but there is

also a sequence of techniques introduced for the purpose of flaking.

At first flakes were removed by the crude "block-on-block" technique; ie., another pebble was used to strike the core and remove flakes.⁵ This was followed by the use of a "soft" hammer, such as hardwood, bone or antler, which provided for more control. The removed flakes became flatter and smoother. In the Middle Palaeolithic broad and triangular flakes were produced by the Levallois technique. Finally, in the Upper Palaeolithic fine blades were regularly removed from drum-shaped cores by the use of a hammer and punch.

This development of technique parallels the development of the typology and the increase in the number of functions for flint tools.

3. The Volume of Flint Deposits

The sheer number of flint tools found in various caves indicates that the occupants were there for considerably longer than Ussher's chronology would allow. For instance the Tuban Cave had over 16 meters of Lower Palaeolithic deposits⁶ including 55,550 tools.⁷ Ksar Akil had 12 meters of only Upper Palaeolithic deposits. The entire Palaeolithic deposit of Ksar Akil uncovered nearly two million worked flints and over one million animal bones.⁸ The two caves may represent about half of the duration of the Palaeolithic in Palestine. There are both earlier and later stages. While it is impossible to derive a chronology from the rate of accumulation of debris and artifacts in a cave, the impressive mass of material from the Palaeolithic when added to the accumulations from the Neolithic suggest a minimum chronology of many hundreds of years and probably a duration of two or three thousand years for all of the cultures prior to the building of cities in about 3000 B.C.

4. The Widespread Occurrence of Palaeolithic Remains

It is noteworthy that the development of Palaeolithic typologies and techniques occurred over a broad area along roughly similar lines. Palaeolithic hand-axes and Levallois flakes have been found from England to China and South to the tip of Africa.⁹

This homogeneity is attributed by uniformitarianists to the painfully slow progress of prehistoric culture. As Biblical Creationists we may suggest that it was due to the unusual ages to which prehistoric men lived and to the uniformity of language prior to Babel. We do not require great ages for the Palaeolithic. Babel probably

*Mr. Ken Guenter teaches at the Caronport High School, and lectures in Old Testament and Ancient History at the Briercrest Bible Institute, Caronport, Saskatchewan, Canada.

dates from the period at the close of the Neolithic at which point archaeology reveals a sudden diversity in cultures world-wide, and also the creation of large structures such as ziggurats, pyramids and megaliths. If this is true then Babel represents the dispersion of only the early Mesopotamian population, but the disruption of language globally.

5. The Correlation of Palaeolithic Cultures With Climates, Fossil Assemblages and Geology

Palaeolithic remains stretch back through the recent glaciations, past the early radio-carbon dates around 50,000 B.P. to the period of great mountain building attributed to two million B.P. Middle Palaeolithic tools along the Palestinian coast are commonly associated with the middle terrace of the fossil beaches.¹⁰ The most interesting Palaeolithic site from a geologic point of view is Ubeidiya on the southern tip of the shores of Galilee.¹¹ Since the Palaeolithic artifacts were left on the shores of the ancient lake there has been a major transgression of the lake to well inland of its present shoreline. This was followed by lava flows, the buckling of the shores and mountainside, and the erosion of the buckled surface to a gentle slope.¹² It is suggested by the geologists that these events occurred within the past 500,000 years.¹³ From a Creationist viewpoint we are no doubt dealing with one of the earliest known sites from the period after the Flood.

Not only is the site likely to have important geologic implications but also the fossils speak of an unusually early time. Amongst the bones of the animals left with the flints were the remains of three-toed horses, sabre-toothed tigers, bears, and an abundance of hippopotami, deer and horses.¹⁴

While the integration of geologic data, fossil assemblages, climatic indications and flint typologies into a comprehensive outline of prehistory is still rather tentative, we can now see the potential for a Creationist reconstruction of the period after the Flood.

6. The Sequence of Radiocarbon Results

Radiocarbon dating has been strenuously attacked by Creationists because it stretches chronologies beyond what we consider to be reasonable limits. Nevertheless, C¹⁴ dates may still be of benefit to us. Though the pre-suppositions which require uniform atmospheric conditions and assume an ancient system may be responsible for inflated dates, the sequence of those dates is still of probable value. This is my approach to the C¹⁴ results for the various layers of the Mt. Carmel caves. With one minor exception, the sequence of the dates for the layers is in the same order as the typology of flints and as the stratigraphy would indicate.

Robert Whitelaw has suggested that generally carbon dates can be accepted as being in their true sequence, as argued above, and that they may also be divided into groups from before or after the Flood.¹⁵ He also suggests that the true age of C¹⁴ dates from the time of the Flood is about 5,000 B.P.

There are however, problems connected with Whitelaw's chronology. First of all, it does not allow enough time for the Post-Flood cultures as argued above in

point 3. Secondly, he has assigned a large number of dates taken from artifacts associated with human culture to the first 500 years after Creation. In other words, it is argued that cultural material from before the Flood is presently available. This is almost impossible if one holds to a catastrophic Flood as recently presented in the *Creation Research Society Quarterly*.¹⁶ Also the archaeological data on the caves of Palaeolithic Palestine while providing C¹⁴ readings older than 45,000 B.P.¹⁷, show no evidence of a catastrophic Flood disturbing the cave deposits. This would seem to invalidate Whitelaw's rather impressive reconstruction of prehistory.

By way of new directions, several possibilities present themselves. Perhaps C¹⁴ dates become hopelessly inaccurate, even for purposes of a sequence, the further back we go. Perhaps the sequence is true in a general sense but the given C¹⁴ age for artifacts from just after the Flood is nearer to 50,000 B.P. This is what the earliest readings from Palaeolithic Palestine would indicate. These, of course, could be recalibrated, as Whitelaw has suggested, to conform to a chronology more acceptable to Creationists. For instance, the C¹⁴ date of 50,000 B.P. might indicate a true age of c.4,000 B.C. or 8,000 B.C. for the Flood.

7. The Cultural Implications of the Flint Tools and Associated Remains

The earliest Stone Age remains do not come from caves. They are found in "open camps". At Ubeidiya, the earliest site in Palestine, we find men living on the shore. There they constructed a floor in Layer I-15.

Professor Stekelis was of the opinion that the living floor was artificially made by the men who lived in the area. This theory is substantiated by the following observations. It is a uniform horizon of one or two pebbles thickness. The sharp-edged angular shape of the stones suggests that they were not carried by water action but brought deliberately and placed with the intention of making a surface. Further, the natural form of the local basalt boulders (especially those of large size) is of one convex and an opposite flatter side. These were chosen and laid with their flat surfaces upwards side by side with the flat-surfaced limestone blocks. In this way men constructed a flat, continuous, dry surface on the marshy bed. On top of this surface, according to Stekelis' theory, they built wind-breaks, shelters, or other installations. Between the area excavated in 1965 and that excavated in 1966, a two-meter wide strip of soil was found (Squares 67,68) without stones. This again supports the concept of an artificial origin of the living floor.¹⁸

Houses do not appear (again?) until the Neolithic; at least 500,000 years later by uniformitarian standards.

The site at Ubeidiya reveals an outstanding collection of hunted animals: catfish, amphibians, turtles, lizards, snakes, shrews, porcupines, wildcats, hyaenas, wolves, saber-toothed tigers, wild boars, three-toed horses, wild horses, deer, antelope, oxen, giraffes, rhinoceros, hippopotami and elephants.¹⁹ It has been suggested that these were acquired by scavenging; but I suggest that is

impossible. In several years of hunting in Saskatchewan and Nigeria, both of which are fine deer zones, I have never seen a dead deer (let alone an edible one) that had not been shot or struck by highway traffic.

The tools at Ubeidiya are all very simple. Flaking techniques were elementary and the tools which resulted were suited to butchering or domestic uses. They could not be used as points for killing.

While these implications are problematic for evolutionists, they conform to creationist predictions. Noah lived in a tent and not a cave. His background included the technology to build a very large ship, and that his descendants were such great hunters comes as no surprise. They probably carried with them hunting and/or trapping techniques and equipment derived from their pre-flood civilization. The rough flint tools at Ubeidiya seem to be their early attempts at replacing tools that had been made of iron or bronze before the Flood. As the tools which survived the Flood wore out or were lost, many could not be replaced. For some, rough substitutes could be made, but in many cases they were simply forgotten and life degenerated as the stone technologies took over. The worst stages of decline seem to be reflected in the Middle Palaeolithic with its degenerate Neanderthal population. By the Upper Palaeolithic, man was adjusting well, using bone and antler as well as producing carefully controlled flints. The Upper Palaeolithic population is essentially modern and in some ways physically superior.

8. The Palaeolithic and Biblical Chronologies

The evidence for an extended series of cultures in the Palaeolithic when added to the data from the Mesolithic and Neolithic plus the Sumerian civilization that preceded Abraham, suggest a period lasting several thousand years following the Flood. Because this evidence is not well known it has largely been neglected; but we cannot honestly do that any more.

One alternative has been to try to compress the pre-Abrahamic history to fit into Ussher's chronology. This has been the thrust of Courville's work *The Exodus Problem and its Ramifications*. Unfortunately Courville is virtually without support in the academic community especially by those into whose specialty he is moving as an outsider. Even evangelical historians have criticized him.²⁰ As a Scientific Creationist, I'm convinced that there is a better way.

For various reasons we may argue that there are gaps in the genealogies of Genesis.²¹ The gaps in questions are probably between Genesis 11:11,12 and verses 17 and 18 where we have sudden drops followed by periods of stability. We cannot stretch these gaps too far but even the King Lists of Sumer suggest many more generations.²² As indicated above, we could expect a *minimum* chronology somewhat on the order of the following:

Abraham	c.2100 B.C.
Babel	c.3000 B.C.
The Neolithic	
The Palaeolithic	
The Flood	c.5000 B.C.
Creation	c.7000 B.C.

The duration of the Palaeolithic is based on the volume of data and an educated guess at the minimum length of time required for its accumulation.

References

- ¹For a general survey of the Palaeolithic, see Bordes, F., 1968. *The Old Stone Age*. McGraw-Hill Book Company, New York, Toronto.
- For a specific survey of the Palaeolithic of Palestine, see Perrot, J., 1972. *Prehistory. Dictionnaire de la Bible, Supplement*, pp. 206 ff.
- ²Garrod, D.A.E. and D.M.A. Bate, 1937. *The Stone Age of Mount Carmel, Volume I*. Oxford: Clarendon Press.
- ³Rust, A., 1950. *Die Hohlenfunde von Jabrud (Syrien)*. Neumunster.
- ⁴Neuville, R., 1951. *Le Palaeolithique et le Mesolithique de Desert de Judee*. *Archives de l'institut de Paleontologie Humaine*, 24, pp. 1-270.
- ⁵*Flint Implements*, 1968. British Museum Publications, University Printing House, Cambridge. Pp. 42-62.
- ⁶Garrod and Bate, op. cit., plate XXIX.
- ⁷*Ibid.* pp. 71-90.
- ⁸Ewing, J.F., 1947. Preliminary note on the excavations at the Palaeolithic site of Ksar 'Akil, Republic of Lebanon. *Antiquity* XXI (84): 186-196. See especially p. 190.
- ⁹Bordes, op. cit.
- ¹⁰Perrot, op. cit. column 299-301.
- ¹¹See Stekelis, M., 1966. Archaeological excavations at Ubeidiya, 1960-1963. Jerusalem. And also Stekelis, M., O. Bar-Yosef, and T. Shick, 1969. Archaeological excavations at Ubeidiya, 1964-1966. Jerusalem.
- ¹²Bar-Yosef, O., 1975. Early man in the Jordan Valley. *Archaeology* 28 (1): 30-37. See especially p. 35.
- ¹³*Ibid.* p. 37.
- ¹⁴*Ibid.* p. 36.
- ¹⁵Whitelaw, Robert L., 1970. Time, life, and history in the light of 15,000 radiocarbon dates. *Creation Research Society Quarterly* 7 (1): 56-71 and 83.
- ¹⁶D'Armond, David B., 1980. Thornton Quarry deposits: a fossil coral reef or a catastrophic Flood deposit? A preliminary study. *Creation Research Society Quarterly* 17 (2): 88-105.
- ¹⁷Perrot, op. cit., column 286 et seq..
- ¹⁸Stekelis, op. cit., pp. 15 & 16.
- ¹⁹Bar-Yosef, op. cit., p. 36.
- ²⁰Yamunchi, E., 1973. *Journal of the American Scientific Affiliation*. December, pp. 160 & 161.
- ²¹Green, 1890. Primeval chronology. *Bibliotheca sacra*. April, pp. 205-303.
- ²²Kitchen, K., 1966. *Ancient Orient and Old Testament*. Tyndale Press. Pp. 36-41.

QUOTABLE QUOTE

Fifty years ago, it was noted that the ratios of cation concentrations in the extracellular fluids (blood, haemolymph, etc.) of different animals were similar to those of seawater, and it was proposed that these composition ratios had become fixed at the time when marine creatures first enclosed internal fluid media . . . this evolutionary theory must be rejected in favour of more direct considerations of cell requirements . . .

Metals in Biochemistry, by P.M. Harrison and R.J. Hoare. P. 69.

SPECIATION OR IRRUPTION: THE SIGNIFICANCE OF THE DARWIN FINCHES†

G. H. HARPER*

Criticism is made of the conventional use of the Darwin finches in teaching. An alternative, 'irruption', theory is presented, to explain the occurrence of the finches in the Galapagos Islands. This postulates that all the species we know today arrived in the archipelago as a mass irruptive migration movement from the north-east. The theory is explained by reference to the European crossbills. In a discussion of the educational role of the theory, it is suggested that we need to make more effort to encourage the creative and critical faculties in advanced work in schools and at undergraduate level. The occasional presentation of alternative theories, and the discussion of their evaluation, are recommended as means to achieving these aims.

1. Introduction

The Darwin finches of the Galapagos Islands are well known to most teachers and students of advanced biology courses at schools and colleges. It is suggested, however, that our use of the Darwin finches in teaching is unsatisfactory; they are usually presented as part of the 'evidence' for Darwinist evolution theory, but this is merely in the sense that the theory can 'explain' or be used to describe the facts. It is not evidence in a strict hypothetico-deductive sense, which must involve the comparison of observations with predictions from the theory.

In paradigm cases of this kind, one is frequently met with the query: 'But what other explanation could there be?' Such a comment is a symptom of bad teaching, since when students are presented with data so closely tied to a single interpretation, they are hardly able to view the interpretation or theory in a critical spirit. In fact my principal contention is that we do not pay sufficient attention to awakening habits of criticism and creative thinking in our students. A different treatment of the Darwin finches could give us, however, a useful basis for pursuing these aims, and the one recommended here involves the comparison of different explanations for the data.

Much has been written on the Darwin finches (Geospizinae), of which there are 13 species in the Galapagos archipelago and a fourteenth on Cocos Island. All the previous studies on the Galapagos species argue or assume that speciation has occurred within the archipelago. However, the next section of this article presents a radically different theory which denies that speciation occurred in the archipelago. Because the theory is easy to understand and makes such a clear contrast with the Darwinian interpretation, it should form the basis for interesting and valuable teaching situations. These are discussed in the final section of the article.

2. The Irruption Theory

One of the main variables studied in the interspecific

variation of the Geospizinae is the number of species on each island, or the insular species abundance. Various factors accounting for this have been proposed: island area, diversity of habitats, isolation from the nearest island, distance from the centre of the archipelago, altitude, richness of the flora, interference by man, interspecific competition, and so on. Though mentioned in passing by Hamilton and Rubinoff¹ (p. 390), the 'target surface' of islands seems not to have been considered seriously for the Galapagos Islands. It is proposed here that the islands do function as targets for immigrants, and that this is the principal factor determining the number of species of Geospizinae on most of the islands.

More particularly it is suggested that the Geospizinae arrived as the species we know today, in an irruptive migration movement on one or more occasions. It is supposed that the flocks approached the archipelago from a constant direction, and that if they crossed a coastline they landed on that island and did not continue in flight to reach another island beyond. Birds flying within sight of an island, however, might be expected to change direction towards it, though under the influence of strong winds the attempt to land on the island might only succeed if they were passing fairly close on a straight course. Moreover a high island would be seen earlier than a low one, and so a border zone directly related to the height of the island and extending the effective width of the island should be added. For each island, a value has been calculated for its 'target width', which for islands fully exposed to the direction of the birds' approach is the width of the island viewed from that direction, with the addition of the border at each extremity. Some islands, however, are 'shadowed' by others from the migration front, and then the 'target width' is calculated only for their 'unshadowed portions'. Finally it is assumed that islands close together could freely exchange bird species by subsequent dispersal.

Given this simple model, it should be possible to find values for the direction of the birds' approach, width of border zone for each increment of altitude, and maximum distance apart of two islands considered to be able to exchange bird species freely, to show a relation between insular species abundance and island 'target width'. For calculation of the values presented in Table 1, it has been assumed that the direction of the migration was 234 degrees, the border zone is 1 km for every 250 m of altitude, and islands up to 15 km apart could freely exchange bird species. The four islands concerned in this last category are Baltra (about 1 km from Santa

*Mr. G. H. Harper has taught biology in school and is now an historian, studying the propagation of opinions on God, man, and nature through nineteenth century educational textbooks. He is neither a special creationist nor an evolutionist, but a steady state theorist. His address is 8 Winton Grove, Edinburgh, Scotland.

†This article was first published in the *Journal of Biological Education*, volume 14, no. 2, pp. 99-106, 1980; and it is reprinted here by permission. The text is exactly the same as in the original printing, except that the Note Added in Reprinting has been added. The layout has been changed a little, to conform to the practices of the *Quarterly*.

The most acceptable explanation may lie in the poor range of habitats on the island; only one of the four vegetation zones found on some other islands is encountered on Hood.⁶

3. Darwin Finches and Crossbills

The development of the irruption theory owes much to the analogy between the Geospizinae and the crossbills, *Loxia*, an analogy which can probably be carried further than hitherto. Within each group, (a) the plumage of the different species is fairly uniform, (b) a proportion of the males breed in juvenile plumage rather than fully differentiated male plumage, (c) the interspecific variation in body weight is not great, (d) the bill morphology is the main distinction between the species, and (e) there is a correlation between preferred food and bill morphology. This is illustrated for the crossbills in Fig. 3. The migration behaviour of crossbills is of particular interest in the context of the irruption theory, and an account is given by Newton⁷ who has reviewed the migration behaviour of the European finches. Finches which normally have a food supply (often herb seeds) which is dependable from year to year tend to have a fairly steady breeding population in any given area from one year to the next. They also tend to have rather circumscribed migration behaviour, with fixed breeding and wintering areas, and regular migration routes. The irruptive species, on the other

hand, have more widely fluctuating breeding populations in a given area, and when they migrate they often spread over extensive and varied areas (i.e., they irrupt). They frequently do not return to the same breeding areas two years running. The fundamental reason behind this appears to be the species' dependence, for part of the year at least, on tree seeds. Unlike many herbs, some of the important trees do not produce a constant crop of seeds in any one area; heavy crops may only occur once every few years. The interval between good crops may be longer the further north in Europe the trees are growing. However, while there may be a poor crop in one area, there may be a good crop in other distant areas. The fluctuating populations and erratic direction of movements are probably related to this unreliability of the food supply. Species of irruptive finches are the crossbills, Siskin, Northern Bullfinch, Mealy and Lesser Redpolls, Pine Grosbeak, and Brambling.⁸

The crossbills are somewhat different from the other irruptive finches, perhaps because they rely on tree seeds for the whole year, and not just a part of it. Crossbill's migratory behaviour is correspondingly peculiar. While most finches which migrate do so twice a year, crossbills in Europe (but not in North America) migrate only once; and even then, they may migrate only in some years, remaining where they are in others. These movements take place in mid-Summer, when one crop of spruce has finished and before the next is ready. In most years when crossbills move, they do so in various directions, from an area of failing food supply to another which is, or promises to be, better.

However, in exceptional years, crossbills indulge in a longer and more directed migration which may result in the birds invading far distant areas in great numbers. In these years, they tend to move predominantly in one direction, and to cover vast distances, up to 4000 km, often passing right through good feeding areas where normally they would stop. The stimuli which set off this mass movement seem to be high population density and a relatively poor seed crop. The birds can be seen to be unusually restive before setting off, and if this restiveness is communicated from one species of crossbill to another, it may explain why the different species tend to irrupt simultaneously; in addition, the food species of the different crossbills tend to crop in phase^{9,10}.

In the irruption theory, the Geospizinae are supposed to have had the same migratory behavior as the crossbills, and this would account for the simultaneous mass movement of different species of Darwin finches over the great distances necessary to bring them to the Galapagos from mainland America. One might ask, at this point, why they did not migrate back to their normal home range in a subsequent year, as generally happens with crossbills (though some permanent colonies have been established, in England for instance, as a result of irruptions). One possibility is that the colonizers found themselves in an environment with climate and food species different from those of their home range; it is likely that the conditions causing eruption (movement away from the area), in particular high population density and failing food supply owing to

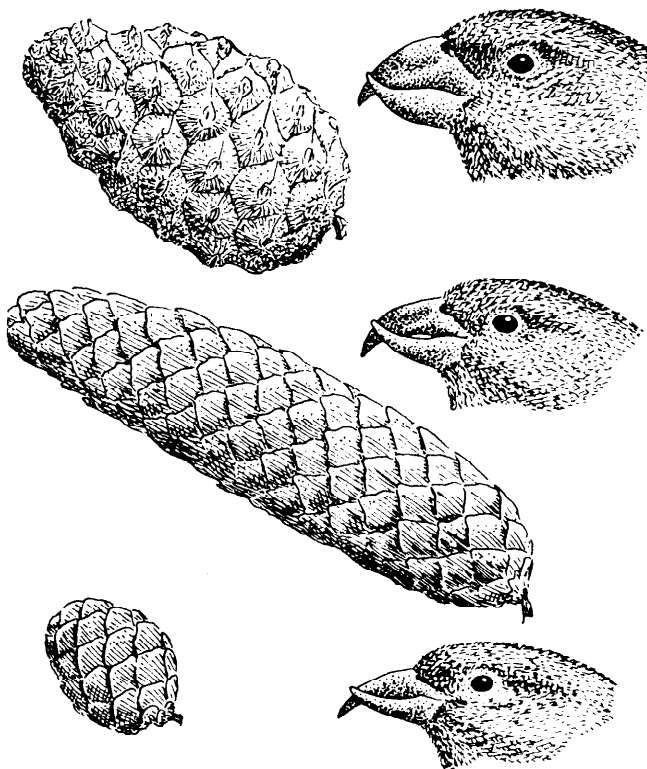


Figure 3. The heads of the three crossbill species, and the main cones eaten: top, Parrot Crossbill *Loxia pytyopsittacus* and pine; centre, Common Crossbill *L. curvirostra* and spruce; bottom, Two-barred Crossbill *L. leucoptera* and larch. After Newton, Reference 7, p. 109.

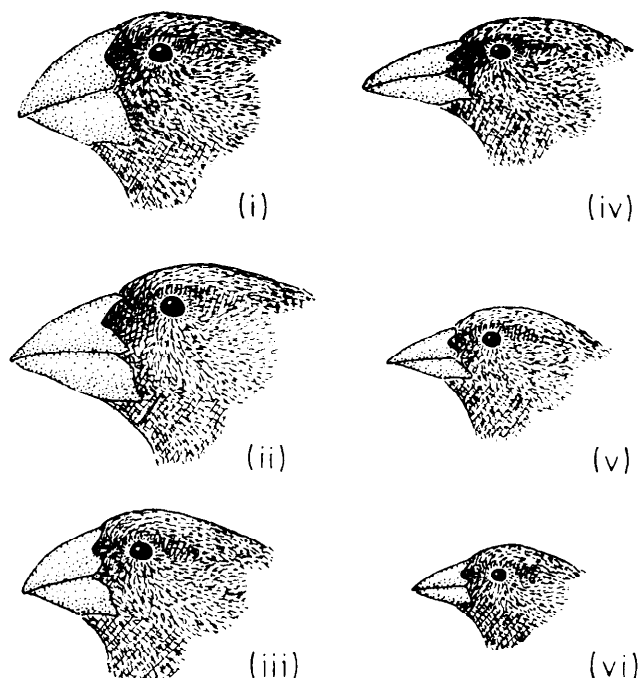


Figure 4. Darwin finches, heads of six species of the genus *Geospiza*: (i) *G. magnirostris*; (ii) *G. conirostris*; (iii) *G. fortis*; (iv) *G. scandens*; (v) *G. difficilis*; (vi) *G. fuliginosa*.

periodicity in cropping of the relevant seeds, never occur on the Galapagos Islands. The irruption theory also supposes that all populations of geospizine finches have become extinct on the American continent; since this is generally believed to have happened for a number of other animal groups, the irruption theory poses no special difficulties in this respect.

4. The Educational Role of Alternative Theories

The following discussion refers to the general use of alternative theories in biology teaching. While the irruption and evolution theories of the Darwin finches are recommended as suitable material, other theories are available, such as those of Dr H. Hillman in electron microscopy,¹¹ and Dr B. E. C. Bank's interpretation of ATP.¹² Discussions on the latter topic are available on tape from Audio Learning Ltd, Sarda House, 183-189 Queensway, London W2 5HL.

Comparison of alternative theories may be used to achieve two aims—the encouragement of creative thinking, and of a critical attitude. It is assumed that these are desirable in a biologist, especially one doing research. The mere presentation of alternatives may help in both aims, and so might a second method, the discussion of the evaluation of theories, for which alternatives are useful but not essential. The aims are distinct, and the methods are distinct, but in practice these distinctions will often be difficult to make out. The kinds of teaching procedure recommended here need only be practised once or twice during an advance school or elementary university course, but during these sessions a number of important ideas can be conveyed to students who might otherwise not come across them.

One use of alternative theories has special relevance to stimulating students' creative imagination. This involves the dramatic presentation of a radical alternative at the end of a course on a generally accepted theory. Thus an extended treatment of evolutionism might be concluded with a brief but convincing account of the irruption theory, so that students experience a kind of 'intellectual shock'. All too often facts and ideas are absorbed uncritically and complacently, and shaking students out of this passive attitude, and leaving them guessing once in a while, could heighten their alertness and stimulate interest. For this to be effective, the radical alternative should be unfamiliar to the students.

Following such a presentation, or instead of it, alternative theories may be compared in a discussion of how theories in science are evaluated. By 'evaluation' is meant the process leading to a theory's acceptance or rejection, or to some comparable attitude towards it. Generally this will involve the scientist deciding whether it is true or false, or more or less likely to be one or the other. Occasionally, however, evaluation may involve rejection on other grounds, of which an example is given shortly. There may be many methods of evaluation, but a short selection of four will now be considered as an aid to conducting a discussion.

1. Most fashionable at present is the hypothetico-deductive approach. For this to be applicable, one must be able to make predictions from the theory in order to compare them with observations. Non-correspondence of prediction and observation leads to rejection of the theory, while if they correspond one may provisionally accept it. Undoubtedly some biological theories can yield predictions, and so can be evaluated hypothetico-deductively. However it will generally be found that theories in the history of life, such as evolutionism, do not yield predictions, though they may yield expectations based on 'reasonable' assumptions which nevertheless cannot be observed. Such expectations are not legitimately to be used in place of predictions (which are derived by deduction from observations and the theory) in hypothetico-deductive evaluation. The status of Darwin's theory in this respect has been discussed by Harper.¹³ Use of evolution and irruption theories in considering this method of evaluation might therefore lead to interesting and surprising conclusions, in particular that the method cannot be used for either theory.
2. Irrespective of observations, a theory may be evaluated by examining its logical consistency. Thus if a contradiction is found in the theory, it is a sound reason for rejecting it; though failure to find inconsistency cannot be regarded as a reason for acceptance. This inconsistency method has recently been used by Greenwood.¹⁴
3. Another method may be called credibility evaluation. An example is seen in the rejection of Newton's theory of gravitation by some 17th-century Cartesian who could not believe that forces causing motion can act at a distance, without contact of bodies. For them the theory of gravitation was 'beyond belief'. More specifically we can say that a theory is

evaluated by credibility when it is rejected either because it is thought to be incredible, or because it cannot be imagined. This might be a legitimate method for someone whose imagination and open-mindedness corresponds with all that is possible. However, most of us are less talented, and then the evaluation will tend to be determined by the poverty of our imagination or our adherence to other scientific or metaphysical theories. In the case of the irruption theory, the example of the crossbills may be used (legitimately) to assist students to understand the theory; but in addition, some students may find it easier to believe the theory about Darwin's finches as a result of learning about the crossbills. If so, they might well be using credibility evaluation.

4. Related to the last method is evaluation in accordance with the rules of scientific hypothesis formation. A number of early 19th-century theories in biogeography would, if proposed today, be generally dismissed because the supernatural is invoked to explain species' creation. Today, supernatural causes are rejected, either because they conflict with a more scientific method or, perhaps more often, because they conflict with scientists' metaphysical belief in the non-occurrence of miracles. The latter case would be an example of credibility evaluation, but the former is quite a different method relating to scientific convention. One's attitude to the former is presumably related to one's opinion on whether operation of the convention (the refusal to recognize supernatural causes) can be guaranteed not to eliminate true theories. Another rule of hypothesis formation is perhaps Occam's razor, and this might be relevant to the Darwinian and irruption theories.

Not all the points made here about these methods will be universally agreed, but it is hoped they will be found useful in discussion. The four methods have been mentioned because they are all in common use. Biology students should be made aware of them, and they should also be encouraged to have opinions on their legitimacy. The author's opinions are that methods (1) and (2) are legitimate; (4) is legitimate so long as it is realized that it rests on a convention which might in fact exclude true theories; and (3) is entirely disreputable.

It is suggested that the comparison of evolution and irruption theories is a good basis for a discussion of the concept of evaluation, and this in turn will help students cultivate a critical approach to science. As a further aid, the following practical measures are suggested as ways a scientist might set about evaluating the irruption theory; how these relate to the four methods discussed above raises questions for further consideration. The theory might be approached through (a) the

compatibility of the supposed irruption with local climatic conditions; (b) the probable origin of other groups of Galapagos species; (c) the acceptability of the values assumed for the other variables in the model, in relation to migrating passerines' observed behaviour on approaching islands; (d) the applicability of the model to other groups of species in other archipelagos; (e) checking whether the geospizine faunas of the four small islands are subsets of their larger neighbour; and (f) the fossil record.

Acknowledgements

I am grateful to Drs Michael Harris, Ian Newton, Robert Prys-Jones, Andrew Richford, and Michael Roberts for discussion and help with the literature; and to the Edward Grey Institute and Scottish Ornithologists' Club for reading facilities in their libraries. I am solely responsible for the views expressed in this paper.

Note Added in Reprinting

Since the original publication of this article, the author has seen Lack's *Island Biology*,¹⁵ in which Lack considers that there is inadequate evidence for past breeding of *Geospiza fortis* on Hood and *G. fuliginosa* on Wenman. If this is accepted, the insular species abundance of Hood and Wenman should be reduced to three and five respectively. This would remove the anomalous status of Wenman, but enhance that of Hood.

References

- ¹Hamilton, T.H., and I. Rubinoff, 1963. Isolation, endemism, and multiplication of species in the Darwin finches. *Evolution* 17 (4): 388-403.
- ²Swarth, H.S., 1931. The avifauna of the Galapagos Islands. California Academy of Science.
- ³Harris, M.P., 1973. The Galapagos avifauna. *Condor* 75, 265-278.
- ⁴Bowman, R.I., 1961. Morphological differentiation and adaption in the Galapagos finches. University of California Press.
- ⁵Harris, M.P., 1974. A field guide to birds of the Galapagos. Collins, London. P. 45.
- ⁶Reference 4, p. 12.
- ⁷Newton, I., 1972. Finches. Collins, London.
- ⁸*Ibid.*, pp. 219-225.
- ⁹*Ibid.*, pp. 229-239.
- ¹⁰Baker, R.R., 1978. The evolutionary ecology of animal migration. Hodder and Stoughton, London.
- ¹¹Hillman, H., and P. Sartory, 1977. The unit membrane, the endoplasmic reticulum, and the nuclear pores are artifacts. *Perception* 6, 667-673.
- ¹²Banks, B.E.C., 1970. A misapplication of chemistry in biology. *School Science Review* 52 (179): 286-297.
- ¹³Harper, G.H., 1977. Darwinism and indoctrination. *School Science Review* 59 (207): 258-268.
- ¹⁴Greenwood, J.J.D., 1979, 1979. Alternatives to evolution by natural selection. *School Science Review* 61 (214): 161-163.
- ¹⁵Lack, D., 1976. Island biology. Blackwell Scientific Publications, Oxford.
- ¹⁶Lack, D., 1974. Darwin's finches: an essay on the general biological theory of evolution. 1961 ed., Harper and Row, New York.

PANORAMA OF SCIENCE

Photosynthetic Pathways Lead to Creation Design

For several years botanists have realized that plants have three different pathways (not just one) for producing sugar from carbon dioxide and water by use of light energy. The basic pattern common to all plants, its seems, is called "conventional photosynthesis" or just C_3 photosynthesis because it involves chemical reduction of a three-carbon molecule called phosphoglyceric acid or PGA for short.

In a fascinating review, Peter Moore recently wrote that "Most plants fix carbon only by the method of photosynthesis described above; and—because the first product of carbon fixation is the three-carbon PGA—are called C_3 plants."¹ Although admitting that "... C_3 plants—like the oak—are high successful," Moore described some feature of C_3 photosynthesis that put such a plant at a distinct disadvantage in certain environments because, for one thing, C_3 plants must have their pores (stomata) open and may thereby lose lots of water while synthesizing sugar.

He hastened to illuminate the reader on details of two alternative schemes of photosynthesis which enable some plants to endure adverse conditions—CAM or Crassulacean Acid Metabolism and C_4 photosynthesis. The interested reader may consult Moore's article and study these other photosynthetic pathways in greater detail but it will suffice here to say that the CAM pathway assists it plants to carry out photosynthesis with much less water loss as CAM plants generally have their stomate pores open at night and closed by day. The C_4 plants, on the other hand, are able to carry out photosynthesis more efficiently because the process is inhibited much less by high temperatures, high oxygen concentrations or low carbon dioxide concentrations than is conventional photosynthesis.

While Dr. Moore assumed that "To overcome these problems plants have evolved at least two strategies, which they superimposed on the basic mechanism of photosynthesis..." he pointed unwittingly to some

data which clearly controvert evolution models as we shall see. If it is true that plants diverged from common ancestry, then one might expect to find the extra pathways of photosynthesis (CAM and C_4) present in certain clusters of genera and families in a pattern that is congruent with the supposed evolutionary basis of plant taxonomy.

To the contrary, no fit is found with evolutionary taxonomy and the distribution of photosynthetic pathways. The CAM pathway was at first believed to be present only in members of one family only of flowering plants but has since been found in various members of 20 other families including both monocots and dicots as well as certain ferns and gymnosperms! Such a scattered distribution defies evolution interpretation unless one is will to grant that these particular members of 21 families each evolved CAM equipment independently—an utterly preposterous idea!

But a similar disparate spread of the C_4 pathway is found among certain members of 19 plant families including monocots and dicots. Once again an evolutionist is forced either to revise all other views of plant evolution or else assume that here too the C_4 equipment arose independently in hundreds of other plants species.

Only an overriding anti-supernaturalist bias would keep a person from suggesting that the CAM and C_4 pathways were incorporated by a Designer into certain plants of widely varying types for the purpose of equipping them to photosynthesize under conditions that would otherwise be too dry or too hot for conventional photosynthesis.²

—Contributed by George F. Howe

References

¹Moore, Peter, 1981. The varied ways plants tap the sun. *New Scientist* 89 (1240): 394-397.

²I am grateful to Professor Harold Armstrong for bringing this clearly written article to my attention.

BOOK REVIEWS

Plants and Archaeology by Geoffrey Dimbleby, 1978. Humanities Press, Atlantic Highlands, New Jersey. Reviewed by Kari Farson*

Plants and Archaeology deals exclusively with "archaeo-botany," a termed coined by the author to identify the study of interrelationships of botany and archaeology. The author introduces his subject by stating that, in principle, he is opposed to writing a book of this nature because "only half of the story is told" (pg. 11). However, he sees a real need for books specializing in how plant remains could form the basis of interpreting the landscape, land use, and cultural activities of man

who lived at the various archaeological sites. With this in mind, the author justifies the limited scope of his book.

The book is divided into three sections. In Part One Dimbleby presents the possibilities for how plants arrived at the sites at which they are found. He surmises the importance of vegetation to early man and the effects man has likewise had on the surrounding vegetation. He then lists the various uses of plants in ritual (especially mummification) and in medicinal preparations and discusses the theories devised to explain the origin of cultivated plants. Dimbleby concludes that although the introduction of agriculture may have removed some hazards of life, it also fostered too great a dependence on food crops (pg. 71).

Dimbleby devotes the middle section of his book to a

*Miss Kari Farson is a Biology Major at Los Angeles Baptist College. Her address is 13697 Oak Glen Road, Cherry Valley, California 92223.

discussion of the preservation of plant material. After a brief chapter on basic plant physiology and the factors influencing preservation and decay, he focuses on the preservation and identification of wood, pollen, and spores, concluding the section with a chapter on various other plant remains.

The interpretation of the evidence obtained through botanical studies is the subject of Part Three. Dimbleby begins by surveying the changes in the landscape and the degree of man's responsibility in it. He then discusses data that can be gained from soil studies and the various theories of vegetative succession. His final chapter deals with the methods of and inherent problems encountered in dating by plant remains concluding that their most accurate use is for supplying valuable information about ecological trends, vegetational history, and the present status of the landscape.

I found this book to be very easy to understand and extremely informative. Although sparsely illustrated, the book contains vivid word pictures and lucid explanatory material which help its readers satisfactorily assimilate the information presented. The author begins each chapter with a paragraph explaining its botanical relevance to field of archaeology. Throughout his work, Dimbleby is careful to distinguish between speculation and fact and points out potential errors and discrepancies as they come into view. In addition to mentioning his own experiences where applicable, Dimbleby makes frequent allusions to the research of others and refers interested readers to more comprehensive books.

Dimbleby integrates into each chapter admonitions and advice directed to archaeologists. "Interpretation of the evidence may be difficult, but at least let us have the evidence," he declares, speaking as an experienced botanist (pg. 98). He also gives much helpful advice on how to transport safely the materials excavated, the archaeologist's role in reducing the botanist's workload, and how the data obtained by botanical analysis can be safely interpreted. He strongly emphasizes that there should be open communication between the archaeologist and the botanist in order to successfully integrate their reports and determine ahead of time if there will be a conflict between the treatment necessary for conservation of the artifact and that necessary for the botanical experimentation and identification. In other words, "Nobody handling the material should be left in the dark" (page 111).

Although not directly stated, the author writes his book in the time framework of evolution, making frequent references to the geologic time chart involving millions of years. The interesting thing was, though, that Dimbleby, in his presentation, often inadvertently supports the Creationist principle of a 5-6000 year existence of man. For example, he states that plants on the earth were taxonomically *very much as they are today*, varying primarily in their distribution, and that the "evolutionary ancestors" of cultivated plants are *difficult to trace*. He also states that the earliest records of agriculture go back only about 10,000 years and are found first in the Fertile Crescent—exactly where the Biblical Creation took place! Moreover, the earliest sites cited in discussing *man's* influence on vegetation

are dated at about 5600 B.C.—clearly within Creation's time fabric.

I found it especially interesting to learn that no major crop has been brought into cultivation from the wild during the past 5000 years—a fact that the author related to the importance of prehistoric man's achievement, but which could equally be accounted for by the wide range of cultivation God placed on the earth at the time He instructed Adam to "dress" and "keep" the Garden of Eden (Genesis 2:8-9, 15). It is exciting to see how God can use even secular literature to reveal His hand in the history of both human and plant life!

In conclusion, I would recommend this book to both the casual reader and to those interested in pursuing a career as an archaeologist or as a botanist who must deal with archaeological "finds." It is well worth the time.

Incredible Life: A Handbook of Biological Mysteries. Compiled by Wm. R. Corliss, 1981. Illustrated by John C. Holden. The Sourcebook Project, Box 107, Glen Arm, MD 21057. 1018 pp., 100 illustrations, hardback, \$22.50.

Reviewed by George F. Howe*

Some volumes like "The Guinness Book of World Records" are not intended to be read from cover to cover but to be kept available in some handy spot for continual browsing, snatch reading, and ready reference. "Incredible Life" is just such a book, packed with about 800 short, punchy, and sometimes startling excerpts from the literature of life science.

As the author asserted in the preface, this work is more than another treatise on bigfoot or the Loch Ness monster. Corliss has collected a medley of scientific reports concerning phenomena which seem to violate established scientific dogmas or at least range off into the great domain of events not satisfactorily explained by recourse to existing scientific theories.

This work is a biological "Believe It Or Not" with all the documentation that Ripley never supplied. Each article (whole, part, or abstract) is reproduced without comment. Dates of these selections range from the early nineteenth century (1820's) right up to 1980. While most of the excerpts come from *Science*, *New Scientist*, *Nature*, *Science Newsletter*, and *Scientific American*, some derive from other journals like *Evolution*, *Quarterly Review of Biology*, *Sea Frontiers*, *Smithsonian Magazine*, *Mosaic*, *Proceedings of The Royal Society*, *Popular Science*, and others. Many of the very old references appeared in magazines such as *Zoologist*, *English Mechanic*, and *American Journal of Sciences* with which I am not at all familiar—perhaps because these sources have ceased publication or changed their names. An interesting side experience in studying these reports is to savor the nuances in patterns of scientific expression manifest throughout such a broad span of time.

*George F. Howe, Ph.D., is Professor and Chairman, Division of Natural Sciences and Mathematics, Los Angeles Baptist College, Newhall, California 91321.

Many phenomena covered in "Incredible Life" are difficult if not impossible to explain by existing macroevolutionary models. One of the best of these was written by none other than the widely published evolutionist, Stephen Jay Gould concerning what he called, "The Problem of Perfection" pp. 723-725. Gould marveled at a remarkable instance of mimicry in in which a mussel displays a "pseudofish" which is actually part of the mussel's own mantle clearly resembling a fish in both shape and movement! This clever portrayal evidently lures fish which swallow the larvae swimming near the adult mussel and the larvae then thrive inside the fish's gills! Concerning the origin of marvelous relationships like this, Gould admitted that, "The argument still rages, and organs of extreme perfection rank high in the arsenal of modern creationists." p. 724

Readers of Creation Research Society Quarterlies will be pleased to find that several articles from C.R.S.Q. have been included in this collection; and the dust jacket itself bears our own Willis Keithley's photo of an ichneumon wasp drilling a hole in a tree with her ovipositor in quest of a bark beetle below in which she will lay her eggs parasitically (C.R.S.Q. 11:183, 1975). These articles and many others by both creationists and macroevolutionists will be of use in exposing the underlying problems and weaknesses associated with that origins model we call evolution. Excerpts of the late and great Douglas Dewar's writings are included such as his telling comments about the supposed "vestigial organs" in man and animal forms.

Perhaps the best way to communicate the breadth and diversity of items covered throughout this work is to list a few titles exposed by a random turning of its pages: a tailed child, inheritance of physical injuries, a piebald family of white Americans, sun-spots and the plague, early summer favours the birth of a boy, inheritance of artificial mutilations, the unicorn, incredible adaptations of woodpeckers, frogs of Mexican forests learning to fly and climb, giant snakes, nuclear DNA contents of coelacanth erythrocytes, synchronous rhythmic flashing fireflies, a slug that fixes CO₂, longevity of *Nelumbo* fruits, synchrony of flowering in bamboos, why does light make slime molds move, selfish DNA—the ultimate parasite, thermodynamics of evolution, and many more. Some readers will doubtless feel that the author went too far in his quest for breadth and openness by including accounts of mermaids, unicorns, and other bizarre subjects.

"Incredible Life" has a generous subject index at the rear but the volume would have been more useful if the authors' name had likewise been indexed. There is a one-page table of contents at the beginning of the book and a detailed listing of topics outlined at the head of each of the 12 chapters. \$22.50 (about two cents per page) is very reasonable for this book which has a sturdy binding of high quality.

"Incredible Life" is recommended for life scientists in their "off hours" as a means of surveying the host of unsolved mysteries in this field and as a way to read for fun. High school and college level science students will also find it a welcome change from the steady drill on basic principles found in most school texts. Since there

is no mention of religious subjects in the volume, it should be a choice item to give to school and public libraries for it contains much potential ammunition against megaevolution models. Its excerpts were apparently selected to attract as wide a readership as possible since most of the articles are free of the heavily specialized vocabulary so common in life science communications. In fact, "Incredible Life" will appeal to almost anyone who has the faintest interest in biology.

Quaternary Geology, by D.Q. Bowen. 1978 Pergamon Press, Oxford.

Reviewed by David J. Tyler*

"There is no doubt whatsoever that Quaternary systematics have been subject to a revolution comparable to that of plate tectonic theory on geology as a whole. Instead of the Pleistocene comprising of four, five, or at most six major glacials, it is a fact that eight glacials and eight interglacials occurred during Brunhes time alone, while altogether some seventeen glacials represent the entire Quaternary. Existing models of classification are no longer adequate, and their terminology at best subject to redefinition, at worst persistent and downright misleading. Existing continental data needs reevaluation." (p. 193)

This radical statement represents the conclusion of Bowen and, it would seem, the majority of geologists working on the Quaternary. The arguments criticising the existing models are powerful and are valuable reading. The case for the new model is well presented, but the difficulties of interpretation are glaringly apparent and, in the reviewer's judgment, the change in thinking hardly warrants comparison with the plate tectonic revolution in the earth sciences.

The first part of the book is basically a critique of the way continental glaciations have been studied and interpreted. The charge is made that oversimplifications have occurred and discoveries have been forced into a pigeon-holed classification. "Such arbitrary methods tend to perpetuate an illusion of security and precision in an apparently repeated confirmation of the original model. This tendency to confirm discoveries from limited amounts of data has been called *The Reinforcement Syndrome* by Watkins (1971), who cites the classical four-fold Alpine subdivision of the Pleistocene as an example. As a result of it labels are used in areas remote from the original localities, and correlation proceeds through completion of conceptual classification boxes. This unfortunate tendency was strengthened by relating the Alpine chronology to Milankovitch's climatic chronology, which was based on mathematical calculations of secular variations in the eccentricity of the earth's orbit, tilt of its axis, and precession of the equinoxes." (p. 8-9)

First to be considered is the celebrated Alpine scheme of glaciations. "The Alpine scheme is clearly unsatisfactory. Yet despite this the terms Gunz, Mindel, Riss and Wurm continue to echo confusingly throughout the

*Mr. David J. Tyler's address is 24 Harrow Road, Brooklands, Sale, Cheshire, England.

Some Classical Schemes of Subdivision*

<i>Alps</i>	<i>Northern Europe</i>	<i>British Isles</i>	<i>North America</i>	<i>East Africa**</i>
WURM	WEISCHSEL	NEWER DRIFT	WISCONSIN	MAKALIAN GAMBLIAN
<i>R-W</i>	<i>Eemian</i>	<i>Ipswichian</i>	<i>Sangamon</i>	<i>inter-pluvial</i>
RISS	SAALE	GIPPING	ILLINOIAN	KANJERAN
<i>M-R</i>	<i>Holstein</i>	<i>Hoxnian</i>	<i>Yarmouth</i>	
MINDEL	ELSTER	LOWESTOFT	KANSAN	KAMASIAN
<i>G-M</i>	<i>Cromerian</i>	<i>Cromerian</i>	<i>Aftonian</i>	<i>inter-pluvial</i>
GUNZ			NEBRASKAN	KAGUERAN

* GLACIALS and *interglacials***PLUVIALS and *interpluvials* (Woldstedt 1965)

world. It would seem that a conscious effort is required to abandon them as labels referring to intervals of time—even in the Alpine region itself.” (p. 18)

Second, the classical sequence for Northern Europe is examined and found wanting. “Because of its morphostratigraphical character the classical Northern European glacial-interglacial classification is inherently defective.” (p. 26) “A major modification of the classical schemes is required. It is too early, however, to regard it as pending.” (p. 29)

Third, the British Isles sequence is considered to be unsatisfactory. The evidence, which is primarily provided by interglacials, is too ambiguous to establish a sound stratigraphy and, consequently, it has been dependent on continental schemes. Since the latter are now in a confused state, the British sequence must be left in similar uncertainty.

Fourth, the glaciations of central North America are reviewed. Each of the different classical stages has been found to contain major interpretative problems. “This arises due to increasingly sophisticated work being incompatible with the over-rigid classical model which, in retrospect, must have been greatly influenced by thinking in Europe at about the same time as its inception.” (p. 53)

Finally, the East African ‘pluvials’ are considered. Only recently the reviewer heard a professional geologist describing how the pluvial periods were correlated with the glaciations of Europe and North America. However, Bowen declares that this is thoroughly discredited and relegated to the role of a historical curiosity. He discusses it to show that the inadequacies of this scheme have much in common with the inadequacies of the glacial schemes in general. If a coherent stratigraphical record of Quaternary events cannot be deduced from the imperfect continental record, where else could it be found? According to Bowen, the answer is: in the sediments of the deep sea floors.

Bowen discusses the sediments of the deep ocean and the different types of information that can be obtained from them: isotopic, palaeontological and magnetic data. (Of particular interest is the excellent discussion of sources of uncertainty of oxygen isotope analyses.) Inter-core correlations are apparent, and it is concluded

that the cores provide a potentially valuable record for establishing global stratigraphical stages for the Quaternary. In fact, Bowen favours the adoption of ONE particular core as the standard. “Indeed there is every reason why Shackleton and Opdyke’s (1973) proposal, that the record of deep-sea core V28-238 be taken as standard for the later Pleistocene, should be accepted, if only provisionally.” (p. 77)

He also quotes with approval the words of Shackleton and Opdyke concerning the record: “It is highly unlikely that any superior stratigraphic subdivision of the Pleistocene will ever emerge.” (p. 76)

The rest of the book is an attempted reevaluation of methodology, terminology, use of dating methods, analysis of fossils, sea level variations, and general discussion of the principles of studying glaciated and non-glaciated regions. Finally, a tentative correlation of many Quaternary events is attempted in the form of a chart.

There are lessons to be learned from the way the four-glaciations scheme has dominated thinking on the Quaternary. Clearly, geologists do not work in isolation, and each draws on the labours of others. The analogy is found in the construction of a building: some dig out for the foundations, some lay the foundations and the majority erect the building. What Bowen has done is to show that, in this case, the construction work has gone on for a long time before it was recognised that the foundations are insecure. This is surely a salutary warning message which has applications far beyond the Quaternary. One point that does not emerge clearly is that without radiometric dating methods, a stratigraphy for the Quaternary will be impossible. “Traditional means of dating and correlation on the continents are hopelessly inadequate and are faced with new problems mostly beyond their resolving capabilities. Almost exclusively, therefore, the burden for dating and correlation falls on radiometric and geomagnetic methods.” (p. 197) However, dating methods are not ‘absolute’. The isotopic variations need to be interpreted in the ‘light’ of the supposed past history of the sample. This introduces an element of subjectivity. The charge of circular reasoning must be carefully considered by those who use radiometric dates as an ‘independent’ source of evidence.

There is no doubt that Quaternary studies are in a state of flux. It will be interesting to see when these new ideas start to affect students of Palaeolithic man—for at present schemes of cultural evolution are heavily dependent on the classical schemes of glacials and interglacials. It is also interesting to consider what alternative geological ideas are possible. Bowen has shown that there is a need for reevaluation, and has indicated his own preference for deep sea cores as the basis for interpreting the continental data. Nevertheless, after reading Bowen's book, the door still seems open for alternative reconstructions. In particular, there are no substantial reasons why catastrophism on a short time scale will not provide an alternative model. Catastrophism upsets the time-clocks on which radiometric dating is based, and without radiometric dates both the traditional scheme and Bowen's scheme collapse.

Eppur Si Muove, by Stefan Marinov, 1977.† C.B.D.S.—Pierre Libert, Place du Luxembourg 11, 1040 Bruxelles, Belgium. 187 pages, \$20.00.

Reviewed by Gerardus D. Bouw.*

Although the cost for this slim tome is rather prohibitive, it is a must for the technically minded who wants either to hone up on his arguments against the theory of relativity or the person who would like an insightful introduction to relativity. To illustrate the importance of this book we need only note that the foreword was written by no less a personage than Andre Sakharov. Stefan Marinov is himself one of the most talented and brilliant scientists of this century; but his works are ignored because he has had the audacity to challenge the idol of this age—Albert Einstein. As a result, Marinov was exiled from his native Bulgaria and has been living in Belgium for the last several years.

Eppur Si Muove is Marinov's attempt at presenting his case for the concept of absolute space to a scientific world committed to relative space. The book is divided into two major parts: the first part deals with the theoretical aspects of the relativity of motion and the se-

cond part review the experimental results, many of which were performed by Marinov himself.

In the theoretical part, Marinov derives his own equations of motion from the Lorentz transformation. His forms for addition of velocity, Lorentz contraction and time dilation are somewhat similar to the standard relativistic forms; but there is a difference, an experimentally detectable difference. For example, and this is not experimental but shows the scope of Marinov's work, he derives the shape of the Hubble curve to be quadratic, not linear. The observed curve is indeed closer to quadratic than linear, linearity being forced upon it by superimposing a number of evolutionary suppositions on the observed curve.

In the experimental section of the book, Marinov details several classes of experiments which have significant application to the question of an absolute space as well as allowing for the distinguishing between the models of Marinov and Einstein. As such it is an invaluable resource book. Included, among others, are experiments of the Roemer type, on drag- and nondrag-abberation, Michelson-Morley type, Sagnac-type, as well as several of Marinov's own which are so subtle that an emotionally involved physicist is likely to miss the crux of the experiment.

Marinov's model, like Einstein's encounters its limits. Neither model, for example, is capable of accounting for the experimental result of the *drag abberation experiment* (see Marinov's text, pages 127-130). Marinov blames this failure as being due to the incompatibility of the Lorentz transformation with the experimental situation. In other words, the Lorentz transformation breaks down in the experiment. One is left with only two readily detectable alternatives: either the earth is not moving with respect to absolute space or, as Marinov opts, there is something about the nature of light which is currently beyond our comprehension. (It might be pointed out that both alternatives are not mutually exclusive in the drag-abberation experiment.) As Marinov verily writes:

Here we have once more to recognize that physics is not a mathematical apparatus to which a physical reality is attached, but a mathematical apparatus attached to a physical reality. (p. 130).

Despite the fact that the references are woefully inadequate, this book is a must for everyone seriously interested in understanding the nature of relativity and its bearing on physical reality. In its pages one finds one of several twentieth century conceptions of the aether.

† While this book is not particularly new, it is not well known—and it deserves to be studied.

* Gerardus D. Bouw, Ph.D., is with the Department of Mathematics, Baldwin-Wallace College, Berea, Ohio 44017.

LETTERS TO THE EDITOR

A New Study of Ammonoidea

One of the major problems for Creationist taxonomy is the apparent general evolutionary hierarchical organization of the geological column. In somewhat the same spirit as the approach recently suggested by Ancil,¹ since 1979 I, a paleontologist colleague, and

some students, have been endeavouring to establish a more embracing and quantified classification of fossil ammonoidae.

So far, our efforts have been directed especially toward the implementation of computer facilities and a new approach for dissecting these fossils. Our collection

in the Ouro Preto School of Mines is small; and it is out of the question for us to obtain the financial support to enable us to buy ammonoidae from everywhere.

Yet this taxonomical approach depends on specimens from all over the world. The reason for this is seen from an argument which is typically Creationistic, but which, as far as I know, is not stated in any text.

First, if a basic kind is to be looked for in the fossil record, one must keep in mind that the last two hundred years' efforts at classification were composed as a patchwork. Many workers subdivided the different taxa according to various, and sometime doubtful, principles.

In the second place, underlying the work of subdivision was an *a priori* assumption of evolution.

Thirdly, although it is recognized, indeed well known, that there are many vertical overlappings, the tendency is to try to subdivide to the maximum specimens, often with little regard to vertical and horizontal location.

Finally, dating is an *a priori* condition of classification.

Thus, our method is to begin by considering the whole bulk of ammonoidae fossils as a non-divided unity at first hand, i.e. independently of vertical, later, or other distribution, all over the world. Such a step, while only methodological, is already established; and very soon the program for classification will be useful.

It is difficult to obtain financial support for this work; for the ammonoidae are not considered very relevant to such practical work as the search for petroleum in the eastern South American basins. Thus we have encountered delays of as much as eight months.

It is my hope that this report will arouse some interest among members of the CRS, or other readers, for the attempted reclassification of the very important ten thousand or so known varieties could be very useful to Creationists, and in catastrophist geology. Not only would cooperation be helpful, but also a show of interest might make it easier for us to obtain some support. I am ready to prepare a further report on our methodological results for the interest of the Christian community of science.

Reference

¹Ancil, Ralph E., 1980. A proposal for a new Creationist discipline. *Creation Research Society Quarterly* 17 (2): 123-127.

Paulo Pereira Martins, Jr., Geol.,
Dr. Sc. T.

Professor of Historical Geology
Universidade Federal De Ouro Preto
Ouro Preto, M.G., Brazil
Received 4 May, 1981

CREATION RESEARCH SOCIETY LABORATORY PROJECT

Background

Since the establishment of the Creation Research Society (CRS) in 1964 a considerable amount of excellent creationist-oriented scientific research has been completed and published. This work has been done by various members of CRS, and others, working on their own time without compensation. We are very much indebted to these people for their fine efforts which have enabled us to publish a *Quarterly* that is obviously having a considerable impact on the scientific and educational communities.

However, because of the very great current interest in creationism we believe the time has come to make a major thrust forward in establishing the superiority of the creation model of science. Therefore, at the April 11, 1981 meeting of the CRS Board of Directors it was decided to establish a Research Center backed by sufficient capital funds to support a number of creationist scientists to carry on full-time research in the various fields of science.

Function of the Laboratory

The Creation Research Society Laboratory (CRSL) will provide a home base for CRS research efforts and will enable us to have several orders of magnitude of increased research capability. The CRSL will have direct supervision of and responsibility for projects approved and funded by the Research Committee. Thus, data collection and interpretation will be the objective of the

laboratory, with publication in the CRS Quarterly as the ultimate goal. In addition, since the laboratory will bring together a number of outstanding investigators for extended periods of time it will provide long-term critical mass cross-fertilization of ideas and mutual encouragement for scientists seriously pursuing creation research.

Supervision of the Laboratory

The general operation of the laboratory will be supervised and coordinated by the laboratory director who will be a working research scientist selected from the CRS board. The director will provide immediate supervision of the laboratory operation and require accountability of all in-house investigators. He will act as an advisor to the Research Committee on budgetary matters and all contemplated and on-going research projects. In addition, the director will be expected to develop his own active research program and act in a public relations and development capacity, representing the laboratory to the government and scientific community, as well as supporting constituency. Finally, the director will supervise the development and maintenance of the physical plant.

Anticipated Projects

It is anticipated that a wide variety of projects will be undertaken. Some of the research we propose to perform at the laboratory relates to:

- (1) influence of geographical barriers on plant and animal distribution.
- (2) analysis of variations by use of controlled environment chambers.
- (3) the rapid deposition of sedimentary strata.
- (4) distribution of pollen in sedimentary strata.
- (5) study of various supposed overthrusts.
- (6) computer simulation of models of origins.
- (7) investigation of validity of polystrate fossils.
- (8) influence of aridity on bristlecone pine annual ring formation.
- (9) investigation of supposed wrong order fossil sequences.
- (10) evaluation of the index fossil concept.
- (11) cave formation in relation to the Flood.
- (12) natural regulation of animal populations.
- (13) taxonomy of plants and animals.
- (14) predator-prey relationships.

Location of the Laboratory

A number of factors must be considered in determining the best location for the CRSL. Prime consideration should be given to ease of access to areas of current and anticipated biological and geological interest, especially since a considerable amount of the research will likely be field-oriented. Though the laboratory will develop limited library holdings of its own, it would be helpful to have a nearby research library. In order to reduce expenses it is desirable to locate in an area with a low cost of living and building, as well as a moderate climate to reduce costs of heating and cooling. If the laboratory is anticipated to be the site of board meetings and other conferences, nearness of airport, motels and restaurants is also important.

The location should also provide sufficient room for expansion to include additional buildings such as greenhouse, animal housing, observatory, dormitories, housing, etc.

Funding of the Laboratory

After considerable discussion the CRS Research Committee decided that capital funding of \$1,500,000 should be achieved, so that the accrued annual interest would pay the salaries of investigators at the laboratory and provide for additional expansion and operating expenses. In order to raise the necessary amount of capital we need 2000 contributors who will donate \$150.00 per year for a period of five years. Thus we are appealing to you to contribute the capital fund. Once established the interest from investing this money will be more than enough to pay salaries with the excess interest to be used for the gradual building of a labora-

tory. Other forms of support for this much needed facility may include gifts and donations of property, stocks, bonds and equipment.

We are well along on this project since a Board member has already offered to donate 20 acres of land on which to locate this Research Center. Other possible locations are also being considered. We trust you will contribute to this effort by sending your first check payable to CRS Laboratory Project to the following address:

E. L. Williams
Chairman, Research Committee
Creation Research Society
5093 Williamsport Drive
Norcross, Georgia 30071

Anyone donating \$750.00 or more will receive a certificate of recognition as a CRS Patron as a token of our appreciation. Also Patrons may purchase all Society-published books at cost. All contributions are tax deductible, and a receipt will be sent to all donors.

Compiled by John R. Meyer, in collaboration with Emmett L. Williams, from discussions at the meeting of the Board of Directors, April, 1981.

QUOTABLE QUOTE

"We live in a technical civilization and the development of complex tools has added greatly to our standard of living. At the same time, these developments have given a new meaning to the phrase 'deus ex machina'. Many exciting things can be learned about nature by simply observing with an open mind.

There is a growing tendency to surrender authority to machines and the experts who run them. This phenomenon is exploited by promoters who stress points like 'computer designed' or 'electronic precision' in order to sell their brand of deluxe toaster. Others make money from the gullibility of people by encouraging the belief that it is impossible for many to understand his environment without the aid of a mechanical civilization (e.g. Von Daniken attributing the works of past civilizations to benevolent space people). In accepting such promotion, people are losing sight of the fact that our most valuable tool is our brain, and that man is little different (better or worse can be argued) from his progenitor of 5,000 years ago."

Dearborn, David S. 1978. Tales of the travels of Newton Schwartz. *The Astronomy Quarterly* 2(8): 229-236. (The quotation is from pp. 234 and 236.)

CREATION RESEARCH SOCIETY

History The Creation Research Society was first organized in 1963, with Dr. Walter E. Lammerts as first president and editor of a quarterly publication. Initially started as an informal committee of 10 scientists, it has grown rapidly, evidently filling a real need for an association devoted to research and publication in the field of scientific creationism, with a current membership of over 600 voting members (with graduate degrees in science) and over 1800 non-voting members. The *Creation Research Society Quarterly* has been gradually enlarged and improved and now is recognized as probably the outstanding publication in the field.

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

Membership Voting membership is limited to scientists having at least an earned graduate degree in a natural or applied science. Dues are \$12.00 (\$14.00 U.S. for overseas) per year and may be sent to Wilbert H. Rusch, Sr., Membership Secretary, 2717 Cranbrook Road, Ann Arbor, Michigan 48104. Sustaining membership for those who do not meet the criteria for voting membership, and yet who subscribe to the statement of belief, is available at \$12.00 (\$14.00 U.S. for overseas) per year and includes subscription to the Annual Issue and Quarterlies. All others interested in receiving copies of all these publications may do so at the rate of the subscription price for all issues for one year: \$15.00 (\$17.00 U.S. for overseas.)

Statement of Belief Members of the Creation Research Society, which include research scientists representing various fields of successful scientific accomplishment, are committed to full belief in the Biblical record of creation and early history, and thus to a concept of dynamic special creation (as opposed to evolution), both of the universe and the earth with its complexity of living forms.

We propose to re-evaluate science from this viewpoint, and since 1964 have published a quarterly of research articles in this field. In 1970 the Society published a textbook, *Biology: A Search for Order in Complexity*, through Zondervan Publishing House, Grand Rapids, Michigan 49506. Subsequently a Revised Edition (1974), a Teachers' Guide and both Teachers' and Students' Laboratory Manuals have been published by Zondervan Publishing House. All members of the Society subscribe to the following statement of belief:

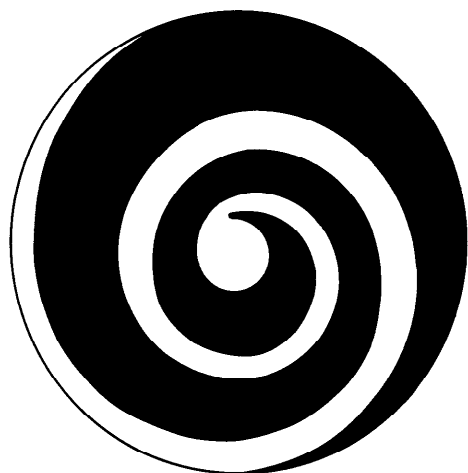
1. The Bible is the written Word of God, and because it is inspired throughout, all its assertions are historically and scientifically true in all the original autographs. To the student of nature this means that the account of origins in Genesis is a factual presentation of simple historical truths.

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

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

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

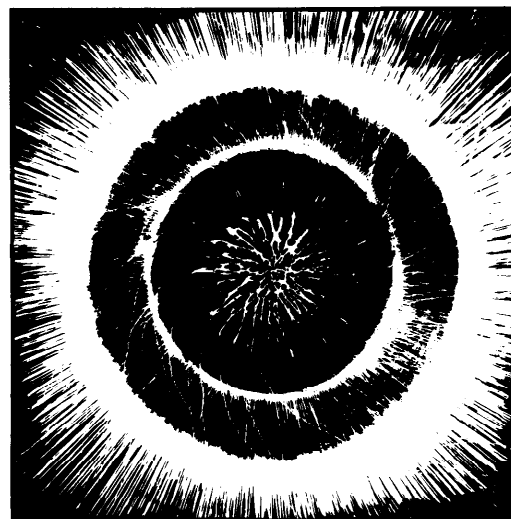
Board of Directors *Biochemistry*: Duane T. Gish, Ph.D., Institute for Creation Research, 2716 Madison Avenue, San Diego, CA 92116. *Biological Sciences*: Wayne Frair, Ph.D., **Secretary**, The King's College, Briarcliff Manor, NY 10510; George F. Howe, Ph.D., **President**, Los Angeles Baptist College, Newhall, CA 91321; John R. Meyer, Ph.D., Los Angeles Baptist College, Newhall, CA 91321; Wilbert H. Rusch, Sr., M.S., LL.D., **Membership Secretary**, Professor of Science, Concordia College, Ann Arbor, MI 48105; E. Norbert Smith, Ph.D., Northeastern Oklahoma State University, Tahlequah, OK 74464; Paul A. Zimmerman, Ph.D., Concordia Junior College, River Forest, IL. *Engineering*: D. R. Boylan, Ph.D., Professor of Engineering, Iowa State University, Ames, Iowa 50011; *Genetics*: John W. Klotz, Ph.D., Director of Graduate Studies, Concordia Seminary, St. Louis, MO 63105; *Geology*: Clifford L. Burdick, M.S., D.Sc., 924 N. 6th Avenue, Tucson, AZ 85705. *Geophysics*: Harold Slusher, M.S., D.Sc., University of Texas at El Paso, TX 79902. *Physical Sciences*: Harold Armstrong, M.S., **Publications Editor**, Queens University, Kingston, Ontario, Canada; Thomas G. Barnes, D.Sc., University of Texas at El Paso, TX 79902; Richard G. Korthals, M.S., **Treasurer**, P. O. Box 135, Arcadia, MI 49613; Henry M. Morris, Ph.D., Institute for Creation Research, 2716 Madison Avenue, San Diego, CA 92116, and President of Christian Heritage College, San Diego; George Mulfinger, M.S., Bob Jones University, Greenville, SC 29614; Emmett L. Williams, Jr., Ph.D., **Vice-President**, Continental Telephone Laboratories, Norcross, GA. *Science Education*: John N. Moore, M.S., Ed.D., 136 Brody Hall, Michigan State University, East Lansing, MI 48824.



Why Not Creation?

Edited by
WALTER E. LAMMERTS

Selected Articles from the Creation
Research Society Quarterly **\$5.95**
(Volumes I-V, 1964-1968)



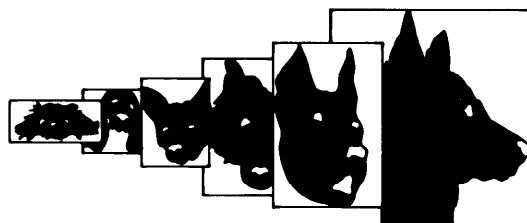
Thermodynamics and the Development of Order

Edited by **Emmett L. Williams**

A Definitive Creationist Study on **\$3.95**
the Implications of Thermodynamics
in the Creation/Evolution Controversy

VARIATION AND FIXITY IN NATURE

FRANK L. MARSH, PH.D.



THE MEANING OF DIVERSITY
AND DISCONTINUITY IN
THE WORLD OF LIVING THINGS,
AND THEIR BEARING ON
CREATION AND EVOLUTION

\$3.95

Creation Research
Society Books

Available at:

5093 Williamsport Drive,
Norcross, GA. 30071

A Decade of Creationist
Research by Duane T. Gish
Reprinted from the Quarterly
for June 1975. 16pp.
75 Cents

All prices prepaid and postpaid