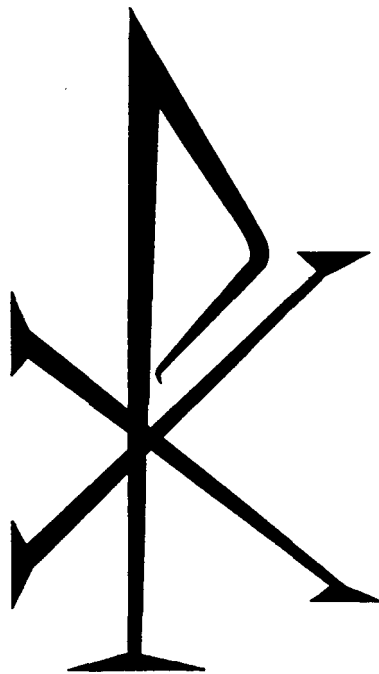


CREATION RESEARCH SOCIETY

1968 ANNUAL



Haec credimus:

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

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1968 ANNUAL

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EDITORIAL COMMENTS

This 1968 Annual begins the fifth year of our publication, and it may be of value to reflect on our original ambitions, as stated in the Introduction to the 1964 *Annual*: "Our aim is a rather audacious one, namely the complete re-evaluation of science from the theistic viewpoint. . . . The wonderful adaptations everywhere so clearly pointing to design are popularly credited vaguely to Nature and spoken of as being the result of evolution by natural selection. . . . It is our hope to publish, from time to time, *original* research. . . . Creationists have too long been merely negative in their thrust, indicating the weaknesses of the evolution theory but offering little in its place."

This 1968 *Annual* contributes much toward a complete re-evaluation of the science of paleontology in relation to the origin of human beings. We are fortunate to have Dr. Arthur Custance, who has for many years published his research under the title of *Doorway Papers*, as a guest contributor. I particularly like his concept that degraded deviant types were actually driven from a central middle Eastern area into less hospitable areas where they suffered physical degeneration.

Dr. George Howe, though primarily a botanist, has long been interested in human paleontology and anthropology. He proposes that all humanoid skulls be documented as to (1) depth in actual feet or meters, (2) condition of strata, (3) number (and size) of kinds of bones, (4) tools and other artifacts, and (5) age by appropriate dating analysis. It is fascinating that both papers by Custance and Howe, written without prior consultation, come to many identical conclusions. Especially interesting is the fact stressed by both authors that skulls resembling modern man are actually buried deeper than those called "primitive" by evolutionists. The proposition submitted in these papers might well form the basis for a creationist textbook of anthropology.

Dr. Wayne Friar's thorough explanation of what Dr. Kornberg and associates really accomplished is most timely. With so much wide-

spread newspaper and magazine publicity that life had really been "created at last, it is important to clearly describe the real accomplishment. This consisted in showing that given the right chemicals, enzymes, temperature and other environmental requirements, *already living* DNA templates can reproduce *outside* the bacterial cell as well as inside.

Dr. William Tinkle discusses the Piltdown fraud and shows how evolutionary bias delayed discovery of the deception for forty-one years! He then comes to the conclusion that many deviant types such as the Neanderthal man and some of the South African fossils were mutant types headed for extinction.

Dr. John Howitt shows that many of man's vital organs were designed for the upright position. His stress on the fact that man is the only creature having an instinct to worship will be hard to explain by evolutionary anthropologists. Man's ability to bow down is associated with this worship instinct as an expression of reverence and respect.

Blood really counts and anyone reading Dr. Evan Shute's paper will certainly have to agree that similarities in blood group reactions, if considered as evidence of descent, lead to some strange conclusions.

Since so many requests were received for a review of the Wistar Institute Symposium on mathematicians' challenge of evolution, I persuaded Harold Armstrong to write a review of Bernhard's article in *Scientific Research*. In addition he submits his quarterly comments on scientific news and views. The experiments on how mountain formation may have affected water level are most interesting, as also is the possibility that petroleum *might* have been formed inorganically.

We hope that other members will submit reviews or articles, having possible significance from our viewpoint of creation and catastrophism.

— WALTER E. LAMMERTS
Editor

DUES CHANGE NOTICE

Due to increased postage rates and cost of mailing service, the decision was made at the Annual Meeting of the Board of Directors of the Creation Research Society to set dues, effective July 1, 1968, as follows:

Voting members	\$7.00 (Foreign, \$8.00 U.S.)
Sustaining Members	\$7.00 (Foreign, \$8.00 U. S.)
Student Membership	\$3.00 (Foreign, \$4.00 U.S.)
(high school and undergraduate college only)	
Subscriptions (libraries, etc.)	\$10.00 (Foreign, \$11.00 U. S.)

Renewals postmarked prior to June 30, 1968 will still be received at previous rates, since the new rates above will be effective July 1, 1968.

COMMENTS FROM PRESIDENT HENRY M. MORRIS

Our Editors have asked me to contribute a page and I am grateful for the privilege. My writings on Biblical creationism for nearly twenty-five years have been as impersonal as possible, to focus the reader's attention more directly on the God of creation and on His Word. Perhaps, however, it might be appropriate to use this column for certain more personal observations, recollections and testimonies. These also, if given and received in the context of praise to our Creator and Redeemer, can be profitable.

I am continually amazed when I compare the situation thirty years ago with that today. I was in college during the period 1935-39, and do not recall ever hearing one of my professors (or preachers, for that matter) ever say a word of even faint praise for the Biblical doctrine of special creation. Evolution seemed to be universally accepted. When I returned to teach at the same school, during the war years 1942-46, I had by then become a fairly outspoken Christian and creationist, but never found even one faculty colleague who would admit, openly at least, to holding the same position.

About 1947 a handful of anti-evolutionist scientists formed the American Scientific Affiliation. In its early years, the A.S.A. maintained a creationist orientation and I became a member. However, even from the beginning, the A.S.A. never seemed to question the validity of the geologic-age concept, and possible geologic implications of the Noahic flood were ignored or rejected. Since the so-called geologic ages are both the outgrowth and the basis of modern evolutionism, it was inevitable that the A.S.A. would eventually become predominantly evolutionist.

But what an encouraging contrast today! God has been raising up men in many fields of science, in many denominations, and in many places.

When a handful of us organized an informal Creation Research Committee in 1963, our most optimistic hopes envisioned a possible ultimate membership some day of perhaps 100 scientists. But now, less than five years later, and with practically no promotional activities or membership campaigns, the Lord has brought forth over 1000 members. Of this number 350 have

at least an M.S. degree, and all are committed to belief in special creation and the universal flood, as well as Biblical Christianity in general. The quality and impact of our publications are continually improving, and I believe you'll agree that this 1968 *Annual* is one of the best yet.

As anticipated, pressures from many directions have been urging us to relax our Biblical and academic membership requirements, but I am glad that the Board, at its 1968 meeting, has unanimously reaffirmed that this will never be done. In spite of what seems to be a rather rigid framework of belief, membership has multiplied far more rapidly than any of us could have possibly anticipated. The evidence is certain that God is blessing and the Society is meeting an urgent need.

We do recognize that many sincere and scholarly Christian men of science may not be willing to accept our Statement of Belief in full, and thus will remain outside our formal membership. We sincerely desire to maintain cordial relations with such men and even to publish papers written by them, as long however, as such papers lend support to our position and purpose.

Rapid growth of membership necessitated that the Board authorize a new Membership Secretary and new Treasurer to rent office space in Ann Arbor and to employ a half-time secretary to improve our mechanical efficiency considerably in handling correspondence and other details. These added expenses, plus the effect of rising costs generally, as well as the continued enlargement and upgrading of our quarters, have finally required a small increase in membership dues from \$5.00 to \$7.00.

Well, the situation is surely more encouraging than it was thirty years ago, or even five years ago. True, evolutionary philosophy remains tremendously powerful and pervasive in every area of modern thought. The hour is late and the odds are almost overwhelming, but I believe we can claim the promise of Revelation 3:8, "Behold, I have set before thee an open door, and no man can shut it: for thou hast a little strength, and hast kept my word, and hast not denied my name."

FOSSIL MAN IN THE LIGHT OF THE RECORD IN GENESIS

ARTHUR C. CUSTANCE*

The evidence indicates that Homo erectus (essentially man as we now know him), Homo habilis and Zinjanthropus were broadly contemporary. Hence any attempt to derive H. erectus from either of the other forms runs contrary to the paleontological record.

Aside from the interesting Olduvai fossils in Africa, the geographical distribution of fossil human remains indicates they are marginal representations of a widespread dispersion of people from a single multiplying population in the Middle East. All were of one basic stock—the Hamitic family of Genesis 10.

The most degraded specimens are from the least hospitable areas where they suffered physical degeneration as a consequence of the circumstances in which they were forced to live.

The extraordinary physical variability of fossil men results from the fact that they were members of small, isolated inbred populations.

Later the Indo-Europeans (Japhethites) displaced or overwhelmed the original Hamitic pioneer stock. All trace back to the three sons of Noah.

1. The Evolutionary Faith

Man is a primate and within the order of Primates is most closely related to the living African anthropoid apes.

So wrote F. Clark Howell recently, thus providing us with a good example of the kind of confident announcement with which evolutionary literature abounds. As it stands, it is purely presumptive. Just because members of a family are apt to look alike, it is not at all safe to assume that all “look-alikes” are related.

Howell’s first statement, “Man is a primate,” is true enough; but his second statement, which is presented as though it were equally factual, is simply supposition without any positive proof whatever. Within the order Primates man may most closely resemble the living African anthropoid apes from an anatomical point of view, but it is quite another thing to state categorically that he is most closely related to them.

Resemblance and relationship are by no means the same thing. Howell does admit in the next sentence that he is not sure how far removed the relationship is, but the basic assumption still remains that the blood relationship exists. Very few readers except those expert in the subject would discern the presumption in Howell’s statement. All that the facts indicate is similarity.

Relationship is totally unprovable by an appeal to morphology. If Howell had said, “Man is anatomically most like the African anthropoid apes,” his statement would have been quite correct. As it stands, his statement is completely hypothetical. He is confusing hypothesis with fact.

The extent to which anthropologists today exercise faith, holding to be true and firmly established what in fact is only hopefully believed, is borne out by several of the following quotations, all of which are from top flight experts in the field. Raymond Pearl, for instance, presents a beautiful example of hopeful possibilities stated as high probabilities by circumlocution when he said:

While everyone agrees that man’s closest living relatives are to be found in the four man-like apes, gorilla, chimpanzee, orang-utan, and gibbon, there is no such agreement about the precise structure of his ancestral pedigree. The evidence that he had a perfectly natural and normal one . . . is overwhelming in magnitude and cogency. But exactly what the individual steps were, or how they came about, is still to be learned. There are nearly as many theories on the point as there are serious students of the problem. All of them at present, however, lack that kind of clear and simple proof which brings the sort of universal acceptance that is accorded to the law of gravitation, for example.

Only on one point, and that one a little vague, can there be said to be general agreement. It is that, on the weight of evidence, it is probable that at some remote period in the past for which no clear paleontological record has yet been uncovered, man and the other primates branched off from what had theretofore been a common ancestral stem.²

In this quotation the phrase “a perfectly natural and normal pedigree” means, of course, an evolutionary one. Pearl assures us that the evidence for this is overwhelming in magnitude and cogency, but in the next breath he speaks only of possibilities and adds that even for these there is no clear paleontological evidence. Many anthropologists today, twenty years after the above was written, would argue that the paleon-

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tological evidence is now at hand in the form of a wide range of catherhine anthropoidea loosely cataloged together as *pithecines*. These creatures include such types as *Dyopithecus*, *Ramapithecus*, *Kenyapithecus*, and of course the more popularly known *Australopithecines*.

Disagreements on Relationships

But a study of the literature in which these fossils are examined indicates first of all that there is considerable disagreement as to their precise status and relationship with one another, and secondly, that there is considerable debate whether they really stand in the line leading to *Homo sapiens*, though hopefully people like Robinson try to slide them across in the family tree so that they at least fall under the heading of hominoidea, whence man is supposed to have evolved. At the present moment it appears to me that there has not been enough time yet to achieve a clear picture, and even granting that evolution were true it still seems unlikely that *Homo sapiens* arrived via a *pithecine* route.

The trouble is that the *Australopithecines* had very small brains indeed, a mean cranial capacity of 575 cc.³ compared with the normal for modern man of 1450 cc. and yet appear to have been tool users. Since by definition man is a cultured animal and tools are an essential part of his cultural activity, some investigators have credited these primitive apes with culture, and for this reason elevated them to man-hood, though at a very low level of course. But there are many who hold that a creature cannot be said to be a "cultured animal merely because it uses tools. Birds use tools, for example, but this could hardly be considered as cultural activity."⁴

I do not know of any unequivocal evidence that the *Australopithecines* deliberately manufactured tools, which is a very different thing. There is evidence of what look like manufactured tools, but it is highly debatable whether they were actually the work of the *Australopithecines* themselves. It has been argued that *Australopithecines* were hunted by early man and that these tools were left by the hunters.

In the second place, it used to be held that cranial capacity and intelligence were closely related. This is seriously questioned today although there is general agreement that a human being cannot be normal with a cranial capacity below about 800 cc., the so-called "cerebral Rubicon."⁵ If there is no real relationship between these two indices, then the very small *Australopithecine* brain might still qualify as "human." But there is certainly no general agreement on the matter. In any case, modern man with his far larger brain is represented by fossils which

were contemporary with the latest in the *Australopithecine* line, so it still seems unlikely that *Homo sapiens* arrived via this route.

Leakey, writing in 1966 with reference to *Homo habilis*, a supposed maker of tools, for a number of reasons rejects any such linear series as *Australopithecus africanus*-*Homo habilis*-*Homo erectus* (the latter being essentially man as we now know him). "It seems to me," he says,⁶ "more likely that *Homo habilis* and *Homo erectus* as well as some of the *australopithecines*, were all evolving along their own distinct lines by Lower Pleistocene times." And again, "I submit that morphologically it is almost impossible to regard *H. habilis* as representing a stage between *Australopithecus africanus* and *Homo erectus*." Leakey adds,

I have never been able to accept the view that *Australopithecus* represented a direct ancestral stage leading to *H. erectus*, and I disagree even more strongly with the present suggestion of placing *H. habilis* between them. . . . It is possible that *H. habilis* may prove to be the direct ancestor of *H. sapiens* but this can be no more than a theory at present. . . .

All that can be said at present is that there was a time at Olduvai when *H. habilis*, *Australopithecus* (*Zinjanthropus*) *boisei* and what seems to be a primitive ancestor of *H. erectus* were broadly contemporary and developing along distinct and separate lines (Emphasis added).⁶

The debate continues, and though specialists do not question man's evolutionary origin, the conclusive links are still missing.

The problem is that although there are a substantial number of fossil candidates which can be manipulated into the proper kind of sequence, the chain seems to lead rather to modern apes—or to extinction—than to man. For certain periods of geological history there are promising successions of fossil forms which look as though they ought to lead to man, but they do not. Very recently, Elwyn L. Simons observed:

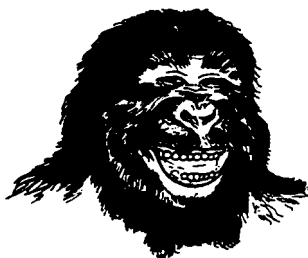
Within the past fifteen years a number of significant new finds have been made. . . . The early primates are now represented by many complete or nearly complete skulls, some nearly complete skeletons, a number of limb bones, and even the bones of hands and feet. In age these specimens extend across almost the entire Cenozoic era, from its beginning in Paleocene epoch some sixty-three million years ago up to the Pliocene which ended roughly two million years ago. . . . But they do not lie in the exact line of man's ancestry.



Zinjanthropus, drawn for the Sunday Times
of April 5, 1964



Zinjanthropus, drawn by
Neave Parker for
Dr. L. S. B. Leakey,
and published by the
Illustrated London News
and Sketch, Jan. 1, 1960.



Zinjanthropus, drawn by
Maurice Wilson for
Dr. Kenneth P. Oakley.

Figure 1. Three different reconstructions of the same fossil Zinjanthropus into "flesh and blood" head and face.

Imaginative Thinking All-Important

When the significance of the data is a subject of so much debate, it is clear that a great deal depends upon imaginative thinking, each authority being persuaded that he is merely reading the evidence, but the disagreement which exists between authorities demonstrates clearly that the evidence can be "merely read in several different ways. For this reason, Melville Herskovits⁸ observed that "no branch of Anthropology requires more of inference for the weighing of imponderable, in short, of the exercise of scientific imagination, than pre-history."

Many years ago, Professor Wilson D. Wallis⁹ pointed out that there is a kind of law in the matter of anthropological thinking about fossil remains which goes something like this: the less information we have by reason of the scarcity and antiquity of the remains, the more sweeping can our generalizations be about them. If you find the bones of a man who has died recently, you have to be rather careful what you say about him because somebody might be able to check up on your conclusions. The further back you go, the more confidently you can discuss such reconstructions because there is less

possibility of anyone being able to challenge you. Consequently, when only a few fossil remains of early man were known, very broad generalizations could be made about them and all kinds of genealogical trees were drafted with aplomb.

A few wiser anthropologists today decry the temptation to draft genealogical trees which, as I. Manton¹⁰ said, are more like "bundles of twigs" rather than trees in any case. And when it comes to the reconstruction of a fossil find into a "flesh-and-blood head and face, the degree of divergence can be even more extraordinary as is shown, for example, in those concocted to represent *Zinjanthropus* for the *Sunday Times* (London), the *Illustrated London News*, and for Dr. Kenneth Oakley by Maurice Wilson, respectively." (Figure 1) The reconstruction of man's evolutionary history is still much more of an Art than a Science. The original fossil skull is shown in Figure 2.

Moreover, as has been recognized for many years and emphasized very recently by J. T. Robinson,¹² habits of life, climate, and diet can tremendously influence the anatomical features of the skull, indeed to such an extent that two series of fossil forms which may very well be in fact a single species are by some authorities put into different genera. I have in mind the *Australopithecines* and *Paranthropus*. How can one take seriously family trees in which the lines of connection are drawn solely on the basis of similarity or dis-similarity in appearance when these similarities or dis-similarities could be nothing more than evidence of a difference in diet? Such cultural or environmental factors cannot only cause two members of a single species to diverge sufficiently to be put into two different genera, but two different genera can for the same reason *converge* until they have the appearance of belonging to the same species. There are some extraordinary examples of convergence.¹³

Morphology No Guide to Relationships

It is evident, therefore, that morphology in itself is not really any kind of guide at all to lineal relationships. Indeed, even the finding of the skeletons of a mother and a child buried together, although it might be presumptive evidence of a mother-child relationship, could never be taken as absolute *proof*. Almost all fossil remains are "proved to be related in this way or that, only in the sense that if you agree to the theory of evolution to start with, the relationship might be reasonably assumed. But in itself similarity of form does not prove relationship.

Those who see in their own finds, or who wish to see in them, more of man than the ape tend to classify them by tacking the suffix *-anthropus*

on to their name. Those who are reemphasizing rather the *antiquity* of their finds may tend to classify them as —*pithecus*. Thus one has two alternative temptations, one being to stress *antiquity* of man's supposed ancestors, and the other the *humanness* of them.

One other factor clearly enters into these naming games and that is the prestige of having made a find which initiates a new genus or sub-family or category of some kind. Thus von Koenigswald calls his Javanese find *Meganthropus*, whereas others see it as merely representative of one branch of the *Australopithecines*. Similarly, Leakey labels his Olduvai finds as *Zinjanthropus*, whereas others would rob his specimens of their unique status by reducing them also to a mere *Australopithecine*.¹⁴

The unfortunate thing is that the very naming of these finds can give to them a weight of importance which can be quite unjustified. The name creates the significance, not the find itself. One thing is certain: not one of these specialists is ever *tempted* to make any pronouncement regarding their particular finds which puts the slightest question mark against their evolutionary origin. Evolution is unchallengeable!

LeGros Clark has pointed out that "practically none of the genera and species of fossil hominoids (and this includes all the *Australopithecines* according to Robinson—added by A.C.C.) which have from time to time been created have any validity at all in zoological nomenclature."¹⁵ And again,

Probably the one single factor which above all others has unduly, and quite unnecessarily, complicated the whole picture of human phylogeny is the tendency for the taxonomic individualization of each fossil skull or fragment of a skull by assuming it to be a new type which is specifically, or even generically, distinct from all others.¹⁶

In the popular mind, the *Australopithecines* are constantly being presented as though they were little by little filling the gap between man and his animal ancestors, and the temptation has been for "fossil-finders" to contribute to this confusion by attaching names to their finds which are intended to reinforce this impression.¹⁷ In point of fact, not only are these names unjustified in many cases but the line itself now appears to have continued its imagined evolutionary development right up into Pleistocene times when modern man was already in existence. This has the unfortunate consequence of making man as old as his supposed ancestors, which seems nonsense to me, but in the evolutionist's Credo, this is his faith, —"the substance of things hoped for, the evidence of things not seen. . . ."



Figure 2. Original fossil skull of *Zinjanthropus* upon which reconstructions shown in Figure 1 were based.

Faith Without Sufficient Reason

There is no question that the theory of evolution is useful as a teaching aid to assist in the orderly arrangement of the data that is available. And there is no doubt also that when the theory is presented for popular consumption, i.e., omitting any mention of problems which yet remain to be solved before it can unequivocally be considered factually established, it has a certain compulsiveness about it, for it appears to explain everything.

This, as a matter of fact, is one reason why there are a few authorities of stature within the camp who nevertheless feel somewhat uneasy about it all in its current theoretical formulation. For a theory which can be made to explain everything by manipulating the threads of the argument to suit the occasion is really unsound for the basic reason that it could never be disproved. As Medawar¹⁸ observes, if a theory is so flexible that the same explanation can be used to account for two entirely contrary tendencies, then the theory is meaningless.

Once it was held that man's enlarging brain caused his emergence as *Homo sapiens*, the great tool-users, so that smaller brained creatures were lower in the scale. Now that the small-brained creatures have turned up as tool-users, it is being argued that the very use of tools is what enlarged the brain to man size! Evolutionary theory is highly "adjustable". Medawar

says, "When we speak as Spencer was the first to do, of the survival of the fittest, we are being wise after the event: what is fit or not fit is so described on the basis of a retrospective judgement. It is silly to profess to be thunderstruck by the evolution of organism A if we should have been just as thunderstruck by a turn of events which would have led to the evolution of B or C instead."

A few years ago, Professor T. H. Leith¹⁹ underscored the fact, which I believe is of fundamental importance, that in order to be useful a theory must be so structured that some critical experiment is conceivable which if it is actually false could prove it to be so. As Medawar²⁰ has pointed out, since absolute proof is beyond our power (for there may always turn up one more piece of evidence which is irreconcilable), the best we can do in any area of research is to constantly seek for error in the hypothesis.

The result of each experiment which does not demonstrate a flaw serves either to confirm the present hypothesis or to purify it by forcing its modification. But the theory of evolution is so flexible that it is simply not possible to conceive of a critical experiment which *could* disprove it. All research seems to be ultimately devoted to proving the theory, not to challenging it. How could one challenge it?

In the meantime, it may be useful enough, heuristically, or even as a philosophy which ministers to our materialism, but it is nevertheless held as an act of faith—indeed Huxley would define it as a kind of Religion.²¹ As such, there is a large element of emotion involved in its defence. In a recent book, *This View of Life*, Simpson reveals this quite remarkably. There are some sections in which he reiterates *ad nauseam* the basic tenet of his faith: "Evolution is a fact."²²

Circular Reasoning Very Common

Circular reasoning plays a large part in current evolutionary anthropology, perhaps as large a part as it does in modern geology, although it is not as readily admitted. The circularity of the reasoning goes something like this: we know that human evolution is true and therefore there must be a succession of forms from some proto-human being up to man spread over the appropriate time scale of millions of years.

Since one can, by disregarding geographical location and taking some liberties with an expansive time scale, line up a set of candidates in fossil form which make what is euphemously termed a "nice sequence," this proves that human evolution is a fact. The possibility that there might be any other explanation for similarity of form is not even considered.

The point is that the mere arbitrary lining up of man-like fossils, even when the temporal ordering is correct, does not prove descent. The assumption is made that descent is the explanation and the line-up is then used to prove the assumption.²³ This is as characteristically circular as much geological reasoning is.

This kind of evolutionary sequence was once very popular in *cultural* anthropology: artifacts developed progressively from simple to complex by known stages; religion evolved continuously from animism to monotheism; art passed from a very low stage of crude representation to its modern sophisticated (?) level of abstraction; in short, everything evolved. Little by little most of these classically familiar evolutionary schemes have been discarded as being either purely arbitrary mental creations or positively contrary to fact. Christian readers sometimes see references to the abandonment of these cultural evolutionary constructs and unfortunately gather the impression that all evolutionary ideas are being abandoned—which is not so at all.

Doubts Africa as Cradle of Man

Unfailingly, human and pre-human fossil remains are still being set forth in such a way as to create the impression that linear relationships actually have been demonstrated between them. As Howell put it, "Man . . . IS most closely related to the living African anthropoid apes", and that's a fact!

It is too soon for us to be able to see the true significance of the many new fossils from Africa and elsewhere, each of which tends, by its discoverer, to be hailed as *the* missing link, until it is challenged as to its significance by the man who is lucky enough to find an even more primitive (or human-like!) fossil. Because most of these fossils have been turning up in Africa, at the present time it is popular to hail Africa rather than the Middle East as the true home of man in spite of the fact that the *Australopithecine line* leads to modern apes and not to man at all, according to many experts.

But there are ways in which the Middle East can still be shown to be the most reasonable cradle of man and that group of fossils widely scattered over the world (in Asia, Africa, and Europe) which by general consensus of opinion *DO* represent early man, such as the *Homo erectus* series, can be accounted for without making them man's ancestors. After all, there is no need to assume automatically that everything that looks like an ancestor is an ancestor . . . it could be a *descendant*. If one believes in evolution, the former is a reasonable enough assumption on account of the fact that these fossil skulls are so very primitive in appearance.

If one believes that man was created, the logic of the argument is not nearly so compelling—for degeneration is as likely as improvement.

On the other hand, provided that one can, for the sake of gaining a new perspective, ignore for the present the time element involved (and there are many uncertainties here), there is a way in which all those fossil remains which are generally agreed to belong within the family of man, *Homo sapiens*, can be accounted for without appealing to evolutionary processes of any kind. And this way is not only reasonable in itself, but has substantial support from what we know of man's early history on the basis of archaeology, the records of antiquity, and modern research into the effects of food, climate, and habit of life on human physique.

2. An Alternative Faith

Whether we believe that the Flood in Noah's day was geographically local or universal, most of those who read this Annual will certainly agree that from the point of view of the world's human population the Flood was an overwhelming catastrophe which left this earth with eight sole human survivors. The same basic agreement would, I believe, be found with respect to the period of time which has elapsed since these eight souls began to re-people the world, a period which cannot be much more than four or five thousand years at the most.

It seems unlikely, even making all conceivable allowances for gaps in genealogies which some are persuaded must exist,²⁴ that one could push back the date of the Flood beyond a few thousand years B.C. In this case, we are forced to conclude that, except for those who lived between Adam and Noah and were overwhelmed by the Flood and whose remains I believe are not very likely to be found, all fossil men, all pre-historic cultures, all primitive communities of the past or the present, and all civilizations since, must be encompassed within this span of a few thousand years. On the face of it the proposal seems utterly absurd.

However, I think there are lines of evidence of considerable substance in support of it. In setting this forth all kinds of "buts" will arise in the reader's mind if he has any broad knowledge of current physical anthropology. An attempt is made to deal specifically with a number of these "buts" in other papers by the author²⁵, yet some problems remain unsolved, particularly the question of the time element. However, one does not have to solve every problem before presenting a hypothetical reconstruction. After all, the orthodox view is shot full of them, and yet it is still held to be a respectable one!

Main Contention Presented

It is our contention that Noah and his family were real people, sole survivors of a major catastrophe, the chief effect of which was to obliterate the previous civilization which had developed from Adam to that time. When the Ark grounded, there were eight people alive in the world . . . and no more.

Landing somewhere in the highlands north of Mesopotamia, they began to spread as they multiplied, though retaining for some time a homogeneous cultural tradition. The initial family pattern, set by the existence in the party of three sons and their wives, gave rise in the course of time to three distinct families of man. According to their patriarchal lineage, these families have been termed appropriately – Japhethites, Hamites, and Shemites, but in modern terminology would be represented by the Indo-Europeans (Caucasoids), the Mongoloid and Negroid peoples, and the Semites (Hebrews, Arabs, and some more ancient branches of the family such as the Assyrians, etc.), respectively.

At first they kept together, but within a century or so they began to break up and subsequently some of the family of Shem, some of the family of Ham, and perhaps a few of the family of Japheth arrived from the East in the southern section of the Mesopotamian Plain.²⁶ Here it would appear from the evidence discussed elsewhere by the author²⁷ the family of Ham became politically dominant, initiated a movement to prevent any further dispersal by the erection of a monument high enough to be a visible rallying point on the flat plain, and brought upon themselves a judgment which led to their being forcibly and rapidly scattered to the four corners of the earth. Part of this we know only from the Bible; but part of it we know also from archaeological evidence.

The fact is that in every area of the world where Japhethites have subsequently settled, they have always been preceded by Hamites. This pattern applies in every continent. In pre-historic times the circumstance seems always to be true, the earliest fossil remains of man being Mongoloid or Negroid in character and in head shape, while those that came last belonging to the family of Japheth, ie., Caucasoid. Indeed, in pre- and early historic times, the pattern of events is repeated again and again, whatever cultural advances the pioneering Hamites had achieved tended to be swallowed up by the succeeding Japhethites.

The record of Japheth's more leisurely spread (ie., "enlargement": Gen. 9:27) over the earth has been marred consistently by his destruction of the cultures which were already in existence wherever he arrived in sufficient force to achieve

dominion. It happened in the Indus Valley, it happened in Central America, it happened to the Indian tribes of North America, it happened in Australia, and only numerical superiority of the native population has hitherto preserved parts of Africa from the same fate.

Now in spite of the claims made for the implications based upon the South African discoveries of recent years, it still remains true that whether we are speaking of fossil *Man*, ancient civilizations, contemporary or extinct native peoples, or the present nations of the world, all lines of migration which are in any way traceable or deducible seem to radiate from the Middle East like the spokes of a wheel.

Nature of Evidence to Be Presented

Before presenting some of the evidence, it will be well to summarize briefly the nature of the evidence. Along any migratory route there will be settlements each of which differs slightly from the one which preceded it and the one which stems from it. As a general rule, the direction of movement tends to be reflected in the gradual loss of cultural artifacts which continue in use back along the line, but either disappear entirely forwards along the line or are less effectively copied or merely represented in pictures or in folklore.

When several lines radiate from a single centre, the picture presented is more or less a series of ever increasing circles of settlements, each sharing fewer and fewer of the original cultural artifacts which continue at the centre, while each witnesses the appearance of completely new items developed to satisfy new needs which were not found at the centre. The further from the centre one moves along any such routes of migration the more new and uniquely specific items one is likely to find which are not shared by the other lines, while there will yet be preserved a few particularly useful or important links with the original home base. Entering such a settlement without previous knowledge of the direction from which the settlers came, one cannot be certain which way relationships are to be traced without some knowledge of the culture content of settlements up and down the line in each direction.

There is usually, however, some quite specific type of evidence which allows one to separate the artifacts which have been brought *with* the newcomers from those which have been developed on the site. This is particularly the case whenever complex items turn up, the materials for the making of which would not be available locally. Sometimes the evidence is, as it were, secondhand, existing in the form of an article

which is clearly a copy and has that about its construction which proves it to be so.

For example, certain Minoan pottery vessels are clearly copies of metal prototypes, both in the shape they take and in their ornamentation. Where the pottery handles of these vessels join the vessel itself, little knobs of clay are indicated which serve no functional purpose, but which are clearly an attempt to copy the rivets which once secured the metal handle to the metal bodies of the prototype.²⁸ These prototypes are found in Asia Minor and it is therefore clear which way the line of migration is to be traced, for it is inconceivable that the pottery vessels with its little knobs of clay provided the metal-worker with the clues as to where he should place the rivets.

Tendency for Loss of Culture

In the earliest migrations which, if we are guided by the chronology of Scripture, must have been quite rapid, it was inevitable that the tendency would be markedly towards a loss of cultural items common to the centre as one moves out, rather than a gain of new items.²⁹ Thus the general level of culture would decline at first in certain respects, although oral traditions and things like rituals and religious beliefs tend to be surrendered or changed much more slowly. In due time, when a large enough body of people survived in any one place which was hospitable enough to favour permanent settlement, a new culture centre would arise with many of the old traditions preserved, but some new ones established of sufficient importance that waves of influence would move out both forwards and backwards along the lines whence the settlers had come.

Accompanying such cultural losses in the initial spread of the Hamitic peoples would often be a certain coarsening of physique. Not only would people tend to be in many cases unsuited for the rigours of such a pioneering life and be culturally degraded as a consequence, but food itself would often prove grossly insufficient or unsuitable to their unaccustomed tastes. Not infrequently the food would at first be inadequate for the maintenance of full bodily vigour and the development of entirely normal growth of the young, for dietary disturbances have their effects upon growth patterns.

Indeed, as Dawson³⁰ long ago observed, the more highly cultured an immigrant is when he arrives at a frontier, the more severely is he handicapped and likely to suffer when robbed of the familiar accoutrements of his previous life. This has been noted by those who have studied the effects of food deficiencies upon the form of the human skull for example, a subject

dealt with in some detail by the author elsewhere.²⁵

The effect upon the technological achievement of the newcomers is obvious enough, for a highly educated lady who had never made bread, or mended her own clothes, or cultivated a garden would be far worse off on the frontier when she first arrived than would a London charwoman. Thus the most likely cause of a particularly degraded society at the beginning would not be a *low* cultural background but a high one! And this is certainly the situation that Genesis presents us with immediately after the Flood.

Cradle of Mankind in Middle East

Meanwhile, the occasional establishment, along the various routes of migration, of what might be called "provincial" cultural centres whose influences spread in all directions would greatly complicate the patterns of cultural relationship in the earliest times. By and large, the evidence which does exist strongly supports a Cradle of Mankind in the Middle East, from which there went out just such successive waves of pioneers who were almost certainly not Indo-Europeans (ie., Japhethites).

These pioneers were Hamitic, either Mongoloid or Negroid in type for the most part but with some admixture; and they blazed trails and opened up territories in every habitable part of the earth. They did so, often, at great cost to their own cultural heritage, and to the detriment of the refined physique still to be found in their relatives who continued to reside at their point of origin. In each locality they ultimately either established a way of life which made maximum use of the resources available . . . , or circumstances overwhelmed them and they died out leaving a few scattered remnants behind whose lot must have been appallingly difficult in their isolation and whose physical remains bear witness to the effect.

The Japhethites followed them in due course, often taking advantage of the established technology as the Puritans were to do in North America thousands of years later, sometimes displacing them entirely, sometimes absorbing them so that the two stocks were fused into one, and sometimes educating them in new ways and then retiring. India has seen all three patterns. The Indus Valley people were overwhelmed and entirely displaced or absorbed, and this admixture thousands of years later was once more educated in new ways by a further influx of Japhetic settlers who have since surrendered their dominant status.

One further factor bears upon the degenerative form which so many of the earliest fossils of man seem to show. Although the life span of man declined quite rapidly after the Flood, for several hundred years many people survived to what would today be considered an incredible old age. If we add to the isolation and deprivation of some of these more scattered early pioneers the possibility of their living well past the century mark or perhaps even much longer, the ultimate effect upon their physique would be tremendously accentuated. It has been noted, in fact, that the skull sutures are almost obliterated in some specimens, a circumstance which might reasonably be interpreted as evidence of very extreme old age.³¹ Extreme old age would often tend to modify the skull towards the conventional man-ape form.

More Detailed Examination of Evidence

So much, then, for the broad picture. We shall now turn to a more detailed examination of the evidence: (1) that the dispersal of man took place from a centre somewhere in the middle East and that this dispersal accounts for fossil man, and (2) that those who formed the vanguard were of Hamitic stock, using the term "Hamitic" to mean all the descendants of Noah who were not in the line of Japheth or Shem.

Before man's evolutionary origin was proposed, it was generally agreed that the Cradle of Mankind was in Asia Minor or at least in the Middle East area. Any evidence of primitive types elsewhere in the world, whether living or fossil, were considered proof that man had degenerated as he departed from the site of Paradise. When evolution captured the imagination of anthropologists, then primitive fossil remains were at once hailed as proof that the first men were constitutionally not much removed from apes.

One problem presented itself, however, almost from the beginning, and this was that these supposed ancestors of modern man always seemed to turn up in the wrong places! The basic assumption was still being made that the Middle East was the Home of Man and therefore these primitive fossil types, which were turning up anywhere but in this area, seemed entirely misplaced. Osborn, in his *Men of the Old Stone Age*, accounted for this anomaly by arguing that they were migrants. He asserted his conviction that both the human and animal inhabitants of Europe, for example, had migrated there in great waves from Asia and from Africa. In the latter case, he wrote that it was probable that the source of the migratory waves was also Asia, north Africa being merely the route of passage.

This was his position in 1915, and when a third edition of his famous book appeared in 1936, he had modified his original views only slightly. Thus Osborn has a map of the Old World with this subscription, "Throughout this long epoch Western Europe is to be viewed as a peninsula, surrounded on all sides by the sea and stretching westwards from the great land mass of eastern Europe and Asia—which was the chief theatre of evolution, both of animal and human life".³²

However, in 1930, and contrary to expectations, Professor H. J. Fleure³³ had to admit: "No clear traces of the men and cultures of the later part of the Old Stone Age (known in Europe as the Aurignacian, Solutrean, and Magdalenian phases) have been discovered in the central highland of Asia."

The situation remained essentially the same when, twenty years later, Wilhelm Koppers observed:

It is a remarkable fact that so far all the fossil men have been found in Europe, the Far East, and Africa that is, in the marginal regions of Asia that are most unlikely to have formed the cradle of the human race. No remains are known to us from central Asia where most scholars who have occupied themselves with the origin of men would place the earliest races.³⁴

It is true that some fossil men have now been found in the Middle East, but far from speaking against this area as being central to subsequent migration, they seem to me to speak indirectly—and therefore with more force—in favour of it. We shall return to this subsequently.

Migratory Movements Considered

Professor Griffith Taylor of the University of Toronto, in speaking of migratory movements in general whether in pre-historic or historic times, wrote:

A series of zones is shown to exist in the East Indies and in Australasia which is so arranged that the most primitive are found farthest from Asia, and the most advanced nearest to Asia. This distribution about Asia is shown to be true in other 'peninsulas' (ie., Africa and Europe—added by A.C.C.), and is of fundamental importance in discussing the evolution and ethnological status of the peoples concerned . . .

Which ever region we consider, Africa, Europe, Australia, or America, we find that the major migrations have always been from Asia.³⁵

After dealing with some of the indices which Taylor employs for establishing possible relationships between groups in different geographi-

cal areas, he remarks:³⁶ "How can one explain the close resemblance between such far-distant types as are here set forth? Only the spreading of racial zones from a *common* cradleland can possibly explain these biological affinities." (Emphasis in original)

Then, subsequently, in dealing with African ethnology, he observes,

The first point of interest in studying the distribution of the African peoples is that the same rule holds good which we have observed in the Australasian peoples. The most primitive groups are found in the regions most distant from Asia, or what comes to the same thing,—in the most inaccessible regions. . . . Given these conditions it seems logical to assume that the racial zones can only have resulted from similar peoples spreading out like waves from a common origin. This cradleland should be approximately between the two 'peninsulas', and all indications (including the racial distribution of India) point to a region of maximum evolution not far from Turkestan. It is not unlikely that the time factor was similar in the spread of all these peoples.³⁷

In a similar vein, Dorothy Garrod wrote:

It is becoming more and more clear that it is not in Europe that we must seek the origins of the various Paleolithic peoples who successfully overran the west. . . . The classification of de Mortillet therefore only records the *order of arrival* in the West of a series of cultures, each of which has originated and probably passed through the greater part of its existence elsewhere.³⁸ (Emphasis added)

So also wrote V. G. Childe:

Our knowledge of the Archaeology of Europe and of the Ancient East has enormously strengthened the Orientalist's position. Indeed we can now survey continuously interconnected provinces throughout which cultures are seen to be zoned in regularly descending grades round the centres of urban civilization in the Ancient East. Such zoning is the best possible proof of the Orientalist's postulate of diffusion.³⁹

Henry Field, in writing about the possible cradle of *Homo sapiens*, gives a very cursory review of the chief finds of fossil man (to that date, 1932), including finds from Java, Kenya, Rhodesia, and Heidelberg, and then gives a map locating them; and he remarks:

It does not seem probable to me that any of these localities could have been the original point from which the earliest men migrated. The distances, combined with many geographical barriers, would tend to make a theory of this nature untenable. I suggest

that an area more or less equidistant from the outer edges of Europe, Asia, and Africa, may indeed be the centre in which development took place.⁴⁰

It is true that these statements were written before the recent discoveries in South Africa, or in the Far East at Choukoutien, or in the New World. Of the South African finds we have already spoken—and they do not concern us here since there is no general agreement that they are truly fossils of *Man* or even, in the opinions of some, ancestral to him. The finds at Choukoutien, as we shall attempt to show, support the present thesis in an interesting way. As for the New World, nobody has ever yet proposed that it was the Cradle of Mankind in any case, nor do they antedate the supposedly earliest fossil men in the Old World.

Thus the Middle East could still retain priority as the Home of Man, although in the matter of dating it must be admitted that no authority with a reputation for orthodoxy at stake would ever propose it was a homeland so recently—by our reckoning only 4500 to 5000 years ago. The problem of time remains with us and at the moment we have no answer to it, but we can continue to explore further lines of evidence which in most other respects assuredly do support the thesis set forth in this paper.

Physical Types and Culture

Part of this evidence, curiously enough, is the fact of diversity of physical type found within what appear to have been single families (since the fossils are found all together and seem to be contemporary), which has been a source of some surprise though readily enough accounted for on the basis of central dispersion. Some years ago, W. D. Matthew⁴¹ made the following observation: "Whatever agencies may be assigned as the cause of evolution in a race, it should be at first most progressive at its point of original dispersal. . . ."

Some comment is in order on this observation because there are important implications in it. Lebzelter⁴² pointed out that "where man lives in large conglomerations, physical form tends to be stable while culture becomes specialized: where he lives in small isolated groups, culture is stable but specialized races evolve". According to Lebzelter, this is why racial differentiation was more marked in the earlier stages of man's history. The explanation of this fact is clear enough.

In a very small, closely inbreeding population, genes for odd characters have a much better chance of being homozygously expressed so that such characters appear in the population with greater frequency, and tend to be perpetuated.

On the other hand, such a small population may have so precarious an existence that the margin of survival is too narrow to encourage or permit cultural diversities to find expression. Thus physical type is variant, but is accompanied by cultural conformity. Whereas in a large and well established community, a physical norm begins to appear as characteristic of that population, while the security resulting from numbers allows for a greater range of cultural divergence.

At the very beginning, we might therefore expect to find in the central area a measure of physical diversity and cultural uniformity: and at each secondary or provincial centre in its initial stages, the same situation would reappear. The physical diversity to be expected on the foregoing grounds would, it is now known, be exaggerated even further by the fact (only comparatively recently recognized) that when any established species enters a new environment it at once gives expression to a new and greater power of diversification in physical form. As Le Gros Clark⁴³ put it, "High variability (in type) may be correlated with the fact that (at that time) the rate of hominid evolution was proceeding rather rapidly with the development of relatively small and often contiguous populations into widely dispersed areas with contrasting and changing environments."

Many years ago, Sir William Dawson remarked upon this in both plant and animal biology. From a study of post-Pliocene molluscs and other fossils, he concluded that "new species tend rapidly to vary to the utmost extent of their possible limits and then to remain stationary for an indefinite time".⁴⁴ The circumstance has been remarked upon in connection with insect populations by Charles Brues who adds that "the variability of forms is slight once the population is large, but at first is rapid and extensive in the case of many insects for which we have the requisite data".⁴⁵ Adolph Schultz⁴⁶ has confirmed this generalization for primate populations, and Ralph Linton⁴⁷ remarks upon it in connection with man.

Thus we have in reality three factors, all of which are found to be still in operation in living populations, which must have contributed to the marked variability of early fossil human remains, particularly where several specimens are found in a single site as at Choukoutien, for example, or at Obercassel, or Mount Carmel.

Three Factors of Variability

These factors may be summarized, then, as follows: (a) a new species is more variable when it first appears; (b) a small population is more variable than a large one; (c) when a species shifts (or a few members of it) into a

new environment, wide varieties again appear which only become stable with time. To these should be added a fourth, namely, (d) that small populations are likely to be highly conservative in their culture, thus maintaining many links with the parent body though widely extended geographically.

Fossil remains constantly bear witness to the reality of these factors, but the witness has meaning only, and the facts are best accounted for only, if we assume that a small population began at the centre and, as it became firmly established there, sent out successive waves of migrants usually numbering very few persons in any one group, who thereafter established a further succession of centres—the process being repeated again and again until early man had spread into every habitable part of the world. Each new centre at the first showed great diversity of physical type, but as the population multiplied locally a greater physical uniformity was achieved in the course of time.

Where such a subsidiary centre was wiped out before this uniformity had been achieved and where chance preserved their remains, the diversity was, as it were, captured and frozen for our examination. At the same time in marginal areas where individuals or families were pushed out even further by those who followed them, circumstances often combined to degrade them so grossly that fossil man naturally tends towards a bestial form—but for quite secondary reasons.

That the idea is not altogether unreasonable is borne out by the fact that Le Gros Clark, for example, in discussing Heidelberg Man, asks whether he represents a separate species of man or may not be “merely a deviant peripheral isolate”.⁴⁸ Clark virtually admits the same possibility for Neanderthal Man. For after referring to him as “an aberrant side line . . . a sort of evolutionary retrogression”, he goes on to say, “If the remains of Neanderthal Man are placed in their chronological sequence, it appears that some of the *earlier* fossils, dating from the earlier part of the Mousterian period are less ‘Neanderthaloid’ in their skeletal characters (and thus approach more closely to *Homo sapiens*) than the extreme Neanderthal type of *later* date (Emphasis added)”.⁴⁹

On the other hand, in the earliest stages of these migrations cultural uniformity would not only be the rule in each group, but necessarily also between the groups themselves. And this, too, has been found to be so to a quite extraordinary degree. Indeed, following the rule enunciated above, the most primitive fragments which had been pushed furthest to the rim might logically be expected to have the greatest proportion of shared culture elements, so that

links would not be surprising if found between such peripheral areas as the New World, Europe, Australia, South Africa, and so forth—which is exactly what has been observed.

Such lines of evidence force upon us the conclusion that we should not look to these marginal areas for a picture of the initial stages of man's cultural development nor for a picture of his original appearance. It is exactly in these marginal areas that we shall *NOT* find these things. The logic of this was both evident to and flatly rejected by E. A. Hooten who remarked:

The adoption of such a principle would necessitate the conclusion that the places where one finds existing primitive forms of any order of animal are exactly the places where these animals could not have originated. . . .

But this is the principle of ‘*lucus a non lucendo*’, ie., finding light just where one ought not to do so, which pushed to its logical extreme would lead us to seek for the birthplace of man in that area where there are no traces of ancient man and *none of any of his primate precursors* (Emphasis added).⁵⁰

Nevertheless, the principle may be true—even if it does contradict evolutionary reconstructions.

William Howells has written⁵¹ at some length on the fact that, as he puts it, “all the visible footsteps lead away from Asia”. He then examines the picture with respect to the lines of migration taken by the “Whites” (Caucasoids) and considers that at the beginning they were entrenched in southwest Asia “apparently with the Neanderthals to the north and west of them”. He then proposes that while most of them made their way into both Europe and North Africa, some of them may very well have travelled east through central Asia into China, which would explain, possibly, the Ainu and the Polynesians.

He thinks that the situation with respect to the Mongoloids is pretty straightforward, their origin having been somewhere in the same area as the Whites, whence they peopled the East. The dark skinned peoples are, as he put it, “a far more formidable puzzle.” He considers that the Australian aborigines can be traced back as far as India with some evidence of them perhaps in southern Arabia. Presumably, the African Negroes are to be also from the Middle East, possibly reaching Africa by the Horn and therefore also via Arabia.

However, there are a number of black skinned peoples who seem scattered here and there in a way which he terms “the crowning enigma”—a major feature of which is the peculiar relationship between the Negroes and the Negritos. Of these latter, he has this to say:

They are spotted among the Negroes in the

Congo Forest, and they turn up on the eastern fringe of Asia (the Andaman Islands, the Malay Peninsula, probably India, and possibly formerly in southern China), in the Philippines, and in New Guinea, and perhaps Australia, with probable traces in Borneo, Celebes, and various Melanesian Islands.

All of these are 'refuge' areas, the undesirable backwoods which the Pygmies have obviously occupied as later more powerful people arrived in the same regions. . . .

Several things stand out from these facts. The Negritos must have had a migration from a common point. . . . And it is hopeless to assume that their point of origin was at either end of their range. . . . It is much more likely that they came from some point midway which is Asia.⁵²

Agreement on Lines of Migration

There is, then, a very wide measure of agreement that the lines of migration radiate not from a point somewhere in Africa, or Europe, or the Far East, but from a geographical area which is to be closely associated with that part of the world in which Scripture seems to say that man not only began physically the peopling of the world after the Flood, but also where man began culturally. Looking at the spread of civilization as we have looked at the spread of people, it is clear that the lines follow the same course.

The essential difference, if we are taking note of current chronological sequences, is that whereas the spread of people is held to have occurred hundreds of thousands of years ago, the spread of civilization is an event which has taken place very recently. I think that man was making his long trek to the uttermost corners of the world while at the very same time civilization was blossoming at the centre. I think they were contemporary events: human evolutionists do not.

Interpretations of Fossil Data

It used to be argued that although civilized man is a single species, the far flung fossil remains of man formed separate species in their own right and were therefore not related to modern man in any simple way. Some authorities have proposed, tentatively, for example, a concept such as this by looking upon Neanderthal Man as an earlier species or sub-species who was eliminated with the appearance of so-called "modern man".⁵³ The association of Neanderthals with moderns in the Mount Carmel finds seems to stand against this conception.⁵⁴ And indeed, there is a very widespread agreement today that, with the exception, of course, of the most recent South African finds, all men—fossil, pre-historic, historic, and modern—are one species, *Homo sapiens*.⁵⁵

Ralph Linton viewed the varieties of men revealed by fossil finds as being due to factors which we have already outlined. As he put it:

If we are correct in our belief that all existing men belong to a single species, early man must have been a generalized form with potentialities for evolving into all the varieties which we know at present. It further seems probable that this generalized form spread widely and rapidly and that within a few thousand years of its appearance small bands of individuals were scattered over most of the Old World.

These bands would find themselves in many different environments, and the physical peculiarities which were advantageous in one of these might be of no importance or actually deleterious in another. Moreover, due to the relative isolation of these bands and their habit of inbreeding, any mutation which was favorable or at least not injurious under the particular circumstances would have the best possible chance of spreading to all members of the group.

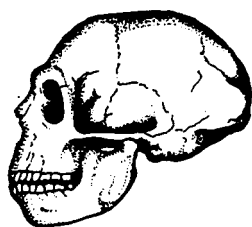
It seems quite possible to account for all the known variations in our species on this basis, without invoking the theory of a small number of distinct varieties.⁵⁶

Viewed in this light, degraded fossil specimens found in marginal regions should neither be treated as "unsuccessful" evolutionary experiments towards the making of true *Homo sapiens* types, nor as "successful but only partially complete" phases or links between apes and men. Indeed, as Griffith Taylor was willing to admit, "the location of such 'missing' links as *Pithecanthropus* in Java, etc., seems to have little bearing on the question of the human cradleland."⁵⁷ And he might in fact also have said, "on the question of human origins". As he concludes, "They are almost certainly examples of a . . . type which has been pushed out to the margins".

Thus the way in which one studies or views these fossil remains is very largely coloured by whether one's thinking is in terms of biological or historical processes. Professor A. Portmann of Vienna remarks:

One and the same piece of evidence will assume totally different aspects according to the angle—palaeontological or historical—from which we look at it. We shall see it either as a link in one of the many evolutionary series that the paleontologist seeks to establish, or as something connected with remote historical actions and developments that we can hardly hope to reconstruct. Let me state clearly that for my part I have not the slightest doubt that the remains of early man known to us should all be judged historically.⁵⁸

This Neanderthal Skull from La Chapelle-aux-saints was in due course



reconstructed thus, for the Field Museum of Natural History, to show how our primitive ancestor looked.



And it was reconstructed thus by J. H. McGregor, to show how 'modern' he really might have been in appearance!

Figure 3. The fossil Neanderthal skull and reconstructions showing how "modern" in many respects Neanderthal Man might have looked.

Fossil Man and Modern Man

This general approach towards the interpretation of the meaning of fossil man has been explored in some detail by Wilhelm Koppers who considers that "primitiveness in the sense of man being closer to the beast" can upon occasion be the "result of a secondary development".⁵⁹ He believes that it would be far more logical to "evolve" Neanderthal Man out of Modern Man than Modern Man out of Neanderthal Man, (Figure 3) He holds, in fact, that they were a specialized and more primitive type-but *later* than modern man, at least in so far as they occur in Europe.

Surprisingly enough, such a great authority as Franz Weidenreich was prepared to admit unequivocally, "no fossil type of man has been discovered so far whose characteristic features may not easily be traced *back* to modern man"⁶⁰ (Emphasis added)! Agreement with this opinion by Griffith Taylor is born out when he observed, "evidence is indeed accumulating that the Paleolithic folk of Europe were much more closely akin to races now living on the periphery of the Euro-African regions than was formerly

admitted."⁶¹ Many years ago, in fact, Sir William Dawson pursued this theme and explored it at some length in his beautifully written but almost completely ignored work entitled, *Fossil Men and Their Modern Representatives*.⁶²

At the Cold Springs Harbour Symposium on "Quantitative Biology" held in 1950, T. D. Stewart in a paper entitled, "Earliest Representative of *Homo Sapiens*," stated his conclusions in the following words, "Like Dobzhansky, therefore, I can see no reason at present to suppose that more than a single hominid species has existed on any time level in the Pleistocene".⁶³

The most primitive types being at the margins and only essentially modern types so far found where civilization had its source, it is to be expected that combinations and intermediate forms would be found in the geographic areas in between. As Alfred Romer observed⁶⁴ in commenting on the collection of fossil finds from Palestine (Mugharet-et-Tabun, and Mugharet-es-Skuhl), "while certain of the skulls are clearly Neanderthal, others show to a variable degree numerous neanthropic (ie., 'modern man') features", while subsequently he identifies such neanthropic skulls as being of the general Cromagnon type in Europe—a type of man who appears to have been a magnificent physical specimen. He proposes later that the Mount Carmel people "may be considered as due to interbreeding of the dominant race (Cromagnon Man) with its lowly predecessors (Neanderthal Man)".

The assumption is still being made that the lower Neanderthal form *preceded* the higher Cromagnon Man. William Howells says of the Skuhl fossil group, "It is an extraordinary variation. There seems to have been a single tribe ranging in type from almost *Neanderthal* to almost *sapiens*".⁶⁵ Le Gros Clark is even prepared to omit the "almost".⁶⁶

Example of Variability

As an extraordinary example of the tremendous variability which an early small isolated population at the periphery can show, one cannot do better than refer to the finds at Choukoutien in China from the same locality in which the famous Peking Man was found. These fossil remains came from what is known as the Upper Cave, and consist of a group of seven people who appear to be members of one family: an old man judged to be over 60, a younger man, two relatively young women, an adolescent, a child of five, and a new-born baby. With them were found implements, ornaments, and thousands of fragments of animals.

A study of these remains has produced some remarkably interesting facts, the most impor-

tant of which in the present context is that, judged by cranial form, we have in this one family a representative Neanderthal Man, a "Melanesian" woman who reminds us of the Ainu, a Mongolian type, and another who is rather similar to the modern Eskimo woman. In commenting on these finds, Weidenreich expressed his amazement at the range of variation. Thus he wrote:

The surprising fact is not the occurrence of Paleolithic types of modern man which resemble racial types of today, but their assemblage in one place and even in a single family considering that these types are found today settled in far remote regions.

Forms similar to that of the 'Old Man', as he has been named, have been found in Upper Paleolithic, western Europe and northern Africa: those closely resembling the Melanesian type, in the neolithic of Indo-China, among the ancient skulls from the Cave of Lagoa Santa in Brazil, and in the Melanesian populations of today; those closely resembling the Eskimo type occur among the pre-Columbian Amerindians of Mexico and other places in North America and among the Eskimos of western Greenland of today.⁸⁷

He then proceeds to point out the upper Paleolithic melting-pot of Choukoutien "does not stand alone".⁶⁸ In Obercassel in the Rhine Valley two skeletons, an old male and a younger female, were found in a tomb of about the same period as the burial in Choukoutien. Weidenreich says, "The skulls are so different in appearance that one would not hesitate to assign them to two races if they came from separate localities". So confused is the picture now presented that he observes:

Physical anthropologists have gotten into a blind alley so far as the definition and the range of individual human races and their history is concerned. . . .

But one cannot push aside a whole problem because the methods applied and accepted as historically sacred have gone awry.⁶⁹

This extraordinary variability nevertheless still permits establishment of lines of relationship which appear to crisscross in every direction as a dense network of evidence that these fossil remains for the most part belong to a single family, the descendants of Ham.

Griffith Taylor links together Melanesians, Negroes, and American Indians.⁷⁰ The same authority proposes a relationship between Java Man and Rhodesian Man.⁷¹ He relates certain tribes which seem to be a pocket of an older racial stock with the people of northern China, the Sudanese, the Bushmen of South Africa, and the Aeta of the Philippines.⁷² He would also link

the Predmost Skull to Aurignacian folk and to the Australoids.⁷³

Macgowan⁷⁴ and Montagu⁷⁵ are convinced that the aboriginal populations of central and southern America contain an element of Negroid as well as Australoid people. Grimaldi Man is almost universally admitted to have been Negroid even though his remains lie in Europe⁷⁶, and indeed so widespread is the Negroid type that even *Pithecanthropus erectus* was identified as Negroid by Buyssens.⁷⁷

T. H. Huxley maintained that the Neanderthal race must be closely linked with the Australian aborigines particularly from the Province of Victoria⁷⁸; and other authorities hold that the same Australian people are to be related to the famous Canstadt Race.⁷⁹ Alfred Romer relates Solo Man from Java with Rhodesian Man from Africa.⁸⁰ Hrdlicka likewise relates the Oldoway Skull with LaQuina Woman; Lachapelle and others to the basic African stock⁸¹; and holds that they must be related also to Indian, Eskimo, and Australian races. Even the Mauer Jaw is held to be Eskimo in type.⁸²

We cannot do better than sum up this general picture in the words of Sir William Dawson who, far in advance of his time, wrote of fossil man in Europe, in 1874:

What precise relationship do these primitive Europeans bear to one another? We can only say that all seem to indicate one basic stock, and this is allied to the Hamitic stock of northern Asia which has its outlying branches to this day both in America and in Europe.⁸³

While it is perfectly true that the thesis we are presenting has against it in the matter of chronology the whole weight of scientific opinion, it is nevertheless equally true that the interpretation of the data in this fashion makes wonderful sense out of the present evidence and, indeed, would have allowed one to predict both the existence of widespread physical relationships as well as an exceptional variableness within the members of any one family. In addition to these anatomical "linkages" there are, of course, a very great many cultural linkages.

One such linkage, as a single example of what I mean, is the painting of the bones of the deceased with red ochre—a custom which not so very long ago was still being practiced by the American Indians and which has been observed in pre-historic burials in almost every part of the world⁸⁴ Surely such a custom could hardly arise everywhere indigenously on some such supposition as that "men's minds work everywhere pretty much in the same way. . . ." It seems much more reasonable to assume it was spread by people who carried it with them as they radiated from some central cradle.

Cradle of Man Reconsidered

And this brings us once more to the question of the geographical position of this cradle. Evidence accumulates daily that, culturally speaking, the place of man's origin was somewhere in the Middle East. No other region in the world is as likely to have been the Home of Man if by Man we mean something more than merely an intelligent ape. Vavilov⁸⁵ and others⁸⁶ have repeatedly pointed out that the great majority of the cultivated plants of the world, especially the cereals, have been traced there as to their origin. Henry Field remarks:

Iran may prove to have been one of the nurseries of *Homo sapiens*. During the middle or upper Paleolithic periods the climate, flora, and fauna of the Iranian Plateau provided an environment suitable for human occupation. Indeed, Ellsworth Huntington has postulated that during late Pleistocene times southern Iran was the *only* (his emphasis) region in which temperature and humidity were ideal, not only for human conception and fertility but also for chances of survival.⁸⁷

Many speculations exist as to the routes taken by Caucasoids, Negroids, and Mongoloids, as the world was peopled by the successive ebb and flow of migrations, and while not one of these speculations really establishes with certainty *how* man originated as *man*, almost all of them make the basic assumption that western Asia is his home as a creature of culture.

From this centre one can trace the movements of an early migration of Negroid people followed by Caucasoid people in Europe. From this same area undoubtedly there passed out into the East and the New World successive waves of Mongoloid people, and the time taken need not have been so great. Kenneth Macgowan⁸⁸ says it has been estimated that men might have covered the 4000 miles from Harbin, Manchuria, to Vancouver Island in as little as twenty years, while Alfred Kidder⁸⁹ says,

A hunting pattern based primarily on big game could have carried man to southern South America without the necessity at that time of great localized adaptation. It could have been effected with relative rapidity, so long as camel, horse, sloth, and elephant were available. All the indications point to the fact that they were.⁸⁹

According to de Quatrefages⁹¹, 600,000 people made a trip from a point in Mongolia to China during winter and under constant attack in just five months, covering a distance of 700 leagues or 2100 miles, and though this seems to be a staggering trip in so short a time, it actually works out to an average of 14 miles per day.

In Africa, Wendell Phillips⁹¹, after studying the relationships of various African tribes, concluded that evidence already existing makes it possible to derive many of the tribes from a single racial stock (particularly the Pygmies of the Ituri Forest and the Bushmen of the Kalahari Desert), which at a certain time must have populated a larger part of the African continent only to retreat to less hospitable regions as later Negroid tribes arrived in the country.

Professor H. J. Fleure⁹² held that evidence of similar nature towards the north and north-east of Asia and on into the New World was to be discerned by a study in the change of head forms in fossil remains, and it has even been suggested that the finds at Choukoutien mean we have encountered some of these first pioneers on their way to the Americas! Moreover, wherever tradition sheds light on the subject, it invariably points in the same direction and tells the same story, many primitive people having recollections of a former higher cultural standing, a circumstance explored elsewhere by the writer at considerable length.

Conclusion

And thus we conclude that from the family of Noah have sprung *all the* peoples of the world, —pre-historic and historic. The events described in connection with Genesis 6 to 10 and particularly the prophetic statements of Noah himself in Gen. 9:25-28 with respect to the future of his three sons, Shem, Ham, and Japheth, together combine to provide us with the most reasonable and best possible account of the early history of mankind. This is a history which, rightly understood, does not at all require us to believe that modern man began with the stature of an ape and only reached a civilized state after a long, long evolutionary history. Rather, we may believe that modern man made a fresh start as a single family who carried with them into an un-peopled earth the accumulated heritage of the pre-Flood world.

Summary

In summary, then, what we have endeavored to show in this paper may be set forth briefly as follows:

a) that the geographical distribution of human fossil remains is such that they are most logically explained by treating them as marginal representatives of a widespread and, in part, forced dispersion of people from a single multiplying population established at a point more or less central to them all, which sent forth successive waves of migrants, each wave driving the previous one further towards the periphery;

b) that the most degraded specimens are representatives of this general movement who were

driven into the least hospitable areas where they suffered physical degeneration as a consequence of the circumstances in which they were forced to live;

c) that the extraordinary physical variability of their remains stems from the fact that they were members of small, isolated, strongly inbred bands; whereas the cultural similarities which link together even the most widely dispersed of them indicate a common origin for them all;

d) that what is true of fossil man is equally true of vanished and of living primitive societies;

e) that all these initially dispersed populations are of one basic stock—the Hamitic family of Genesis 10;

f) that they were subsequently displaced or overwhelmed by the Indo-Europeans (ie., Japhethites) who nevertheless inherited, or adopted and extensively built upon, Hamitic technology and so gained the upper hand in each geographical area where they spread;

g) that throughout this movement, both in pre-historic and historic times there were never any human beings who did not belong within the family of Noah and his descendants;

h) and finally, that this thesis is strengthened by the evidence of history which shows that migration has always tended to follow this pattern, has frequently been accompanied by instances of degeneration both of individuals or whole tribes, and usually results in the establishment of a general pattern of cultural relationships which are parallel to those that archaeology has since revealed from antiquity.

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NEW PUBLICATION

Evolution and the Reformation of Biology by E. L. Hebden Taylor. The Craig Press, Nutley, New Jersey. (Paperback, \$1.50), 1967.

This is a monograph in which the author presents a Reformed scientific approach to modern biology. It is sub-titled, "A Study of the Biological Thought of Herman Dooyeweerd of the Free University of Amsterdam and J. J. Duyvene de Wit, late Professor of Zoology at the University of Bloemfontein, South Africa." Herman Dooyeweerd suggested a truly scripturally directed approach to biology and physics in his monumental *New Critique of Theoretical Thought*.

In the opinion of the author, only a Reformed scientific approach to modern biology can effectively answer modern apostate mega-evolutionism, since it refuses to compromise in any way the scriptural conception of man and the cosmos with the apostate humanist view of reality. The reader will discover that this Reformed scientific approach requires nothing less than a complete reformation in contemporary man's view of time, of substance, as well as of the various structures of the creation, including the structure of the living cell.

After a chapter on the General and Special Theory of Evolution along the lines presented by G. A. Kerkut in his book, *Implications of Evolution* (Pergamon Press, 1960), the author presents specific evidences from paleontology, genetics, and embryology which do NOT support the General Theory of Evolution. Worthy of particular note is mention of the work of C. P. Raven, who has shown experimentally that the basic characters of living organisms, as well as their basic form structures, are determined not so much by their genes as by the so-called egg-cortex or cytoplasm which surrounds every cell nucleus. Apparently nuclear genes begin to unfold their activity only after the body plan has been laid out in broad outline.

The Reverend E. L. Hebden Taylor was born of medical missionary parents in the province of Katanga, Congo, Africa, in 1925. Educated in English schools, he graduated from Trinity Hall, Cambridge University with honors in 1949, and in 1952 received his Licentiate in Theology from the Anglican Theological College of British Columbia at Vancouver, Canada.

EVOLUTION AND THE PROBLEM OF MAN

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Criteria of morphology, taxonomy, reconstructions, tools, brain size, and language are evaluated as possible indicators of the humanity of particular man-like fossils. Depth sequence of hominid fossils is discussed with particular reference to three instances in which skulls that resemble modern man are buried deeper in the strata than others that are judged to be "primitive" by evolutionists. These data are related finally to evolutionism and special creationism, and an unanswered question is posed.

1. The Humanity of Fossils

"Man" shall be defined presently as a creature that possesses the combined traits of emotion, will, reflection, moral knowledge, and intellect, coupled with the abilities of communicating by verbal symbols and making or using tools. With this definition, or some similar one, it is easy to distinguish between a man and a gorilla.

Man has some concept of "good and "evil." Man likewise reflects about yesterday's rainstorm, or is perhaps worried about the threat of impending death from disease. But the gorilla gives no indication of such reflective activity. Furthermore, a fossil is found without either flesh or hair, and the fossil certainly affords no basis for behavioral analysis.

Yet anthropologists and paleontologists try to assess the spiritual nature of fossil materials from direct studies on the bones or artifacts found near them in the strata. Is it possible to erect a developmental series and to assign each man-like fossil to some category such as "non-human," "ancestral," "primitive," "sub-human," or "human" by analysis of existing evidences? The reader will perhaps be prepared to answer this question for himself after considering the criteria and problems involved.

Morphology

Morphology is the study of gross form and structure of organisms. Differences in form of living men do not necessarily indicate differences in intelligence or humanity as Klotz¹ has demonstrated in discussion of Maurice Tillet, "The Angel." This famous wrestler possessed the grossly distorted body and facial features which result from an imbalance thyroid condition known as acromelagly. Despite his bizarre appearance, Tillet was neither intellectually inferior nor "sub-human."

In evolutionary documents dealing with man's origin, the word "primitive" is attached to skulls that differ morphologically from those of modern man. From a broad prospective, however, at least two other possibilities exist in the evalua-

tion of such a "primitive" skull: (1) the skull may differ only in form and may have otherwise pertained to a truly human individual (as with Tillet), or (2) the so-called "primitive" fossil may represent an extinct and entirely non-human group, biologically unrelated to man.

Pursuing the former possibility in a well-documented paper, Custance has shown that bone morphology can be affected by environment and development as well as by genetics.² Custance has provided evidence, for example, that such factors as sex, physiology, and diet may bring significant change in bony structure of modern humans. This same knowledge applies to studies of fossil man; and one cannot be sure that morphologically "different" skulls are necessarily sub-human or ancestral.

Parenthetically, the concept of a supposedly primitive morphology has led certain well-respected investigators to ignore or otherwise disregard primary geological evidence of depth as Custance demonstrated by quoting the famous anthropologist, Franz Weidenreich:

In determining the character of a given fossil form and its special place in the line of human evolution, only its morphological features should be made the basis of decision: neither the location of the site where it was recovered, nor the geological nature of the layer in which it was imbedded is important.³

The unguarded statement of Boule and Vallois⁴ also manifests how morphological considerations have insidiously hindered open evaluation of hominid fossils from North America: ". . . in some cases it is the deposit which is questioned, *sometimes the bones themselves are obviously modern*: often the evidence is unsatisfactory in every respect." The italics are my own and show how the geological position of some deeply-buried skulls has been brought to question, because they happen to look like modern man, who should not appear in deep strata, if evolutionary theory and uniformitarian geology are believed to be valid.

Allied to morphology is the matter of various "linking" fossils. A fairly complete set of morphological links relating man to some anthropoid ancestors would be necessary (but not entirely sufficient) evidence in support of evolutionism.

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The great paucity of fossil intermediates between man and animal, however, is so well-known that it needs little further attention here. De Wit presented diagrams of the actual fossil material fitted into a supposed evolutionary “tree” for man (after Johannes Huertzler). De Wit made this comment about the vacant spaces in the “family tree”:

From the diagram it appears that the group representing the human family is strikingly small in comparison with the long and empty branch of descent which, as the transformist hypothesis demands, goes back to the Oligocene and in which, up to the present, no fossil documentation whatsoever with respect to the assumed animal ancestors of man, has been found.⁵

Taxonomy

Taxonomy is the attempt to name and classify organisms. Some taxonomists are nicknamed “lumpers” because they habitually establish large groups, while others, the so-called “splitters,” tend to create smaller groups, by instituting many separate species.

It is difficult enough to build meaningful and coherent species groups among the living plants or animals, but erecting a taxonomy of fossils is a far more vexing problem. The paleontologist studying man-like remains is frequently so preoccupied with only a very small segment of the biological world that he is tempted to magnify slight differences between separate fossils and to give each minor variant a new species and genus name.

Ernst Mayr believed that unbridled “splitting” has been practiced in fossil taxonomy to such an extent that the classifications have become unrealistic and certainly out of phase with the rest of biology:

“This difference in standards becomes very apparent if we, for example, compare the classification of the hominids with that of the *Drosophila* flies. There are now about 600 species of *Drosophila* known, all included in a single genus. If individuals of these species were enlarged to the size of man or of a gorilla, it would be apparent even to a lay person that they are probably more different from each other than are the various primates and certainly more than the species of the suborder Anthropeidea. What in the case of *Drosophila* is a genus has almost the rank of an order or, at least, suborder in the primates. This discrepancy is equally great at lower categories. . . .⁶

Mayr referred with regret to the fact that various hominid skulls such as the so-called China man, Java man, and South Africa ape man have been partitioned by taxonomists into dis-

tingent genus groups: *Sinanthropus*, *Pithecanthropus*, and *Australopithecus*, respectively. To the contrary, Mayr suggested using only the common names of the fossils and refraining from an absolute taxonomy because:

The formal application of generic and specific names simulates a precision that often does not exist. To give the impression of an unjustified precision is as much of a methodological error as to make calculations to the fifth decimal when the accuracy of the original data extends only to the first decimal.⁷

These uncertainties and others indicate that one cannot turn to fossil taxonomy for evidence in support of man’s proposed evolution. A taxonomy of bones is too indefinite to produce the absolute linking groups and transition stages that would be required by such a theory of development. Although Mayr embraces the evolution theory of man’s ancestry, he believes that all the man-like fossils are really quite similar and that they should be lumped together into only one genus: “It is proposed to classify fossil and recent hominids tentatively into a single genus (*Homo*) with three species (*transvaalensis*, *erectus*, *sapiens*).”

Reconstructions

From the standpoint of appearance, much of the difference between man and ape rests upon the attitude and expression of the face. Key evidence for development of men from beasts should therefore include a series of changes in which the animal face is gradually converted into the expressive countenance of a man.

Those who foster the evolutionary view have produced elaborate reconstructions of the fossil hominids.⁸ A reconstruction is an attempt by artist and scientist to demonstrate how the extinct organism might have looked while living. Unfortunately, skulls and bones do not give an adequate basis upon which to rebuild the physiognomy, as Howells has indicated:

The one kind of reconstruction of which anthropologists are universally suspicious is that which tries to show a fossil man in the flesh, desirable though this is, especially to the public. The reason is that there is no possible way of judging what the soft parts were like, while at the same time these soft parts determine the whole impression which the thing creates. On the same skull two different and equally possible coverings of flesh can make the individual look brutal and apish or human and refined. Suppose only that your own face were tinted and bewhiskered like Gargantua’s, and you will see the force of this, to say nothing of substituting his lips and ears for yours.¹⁰

The philosophical and religious views of the workers who create a reconstruction will insidi-

ously influence its quality. In three splendid series of illustrations, Custance¹¹ has shown that a particular fossil skull such as that of China man, or Neanderthal man, might have had an expression of greater intelligence and humanity than the brutal visage conferred upon them by evolutionary artists.

The Neanderthal skull looks quite “modern” when given appropriate brush-work or ink sketching of flesh and hair. The China skull indeed demonstrates a striking resemblance to the Russian delegate at the 1958 Cairo Conference. A reconstruction by Neave Parker (Leakey’s artist) gave the puzzling *Zinjanthropus* skull a truly soulful expression. (See page seven of this Annual—Editors.)

While of possible interest as an exercise in art or creative imagination, a reconstruction can hardly furnish acceptable scientific evidence for or against the humanity of any particular hominid fossil.

Tools

Since manufacture and use of tools is one human trait, perhaps the tools associated with a fossil hominid will shed light upon its status. Following this assumption, some workers have concluded that tools indicate the presence of human beings. With tools, as with other criteria, however, several problems arise.

Animals other than man use simple natural tools. The whitenek crow drops rocks on ostrich eggs in dive-bombing action.^b Weaver ants will grip and use their thread-forming larvae as living spindles for sewing leaves together, as Goetsch reported:

The use of these ants of a tool not provided by their own bodies sets them off as a rarity in the animal kingdom. Tools were long thought to be an exclusive characteristic of man. Although this is untrue (the apes, for example, use stones for cracking nuts), the use of tools is most uncommon even among the higher vertebrates. Its “implement” enables the weaver ant to live in trees and to build solid nests, without—like related varieties—digging passageways in the wood, a labor for which it is not equipped.¹³

In at least one instance, a male chimpanzee has been seen by Kohler to make tools from bamboo tubes and pieces of wood for the purpose of reaching bananas. In such cases, however, Oakley¹⁴ noted that: “Kohler could obtain no clear indication that apes are ever capable of conceiving the usefulness of shaping an object for use in an imaginary future eventuality.”

Despite the use of natural or even wooden tools by some insects, birds, or apes, a shaped stone tool is often considered the hallmark of

human industry. If this is so, then the presence of shaped tools in fossil strata might help establish the intelligence of hominids nearby. Tools linked to a fossil are certainly better evidence of personality than are reconstructions, taxonomy, or morphology.

Discounting an obvious evolutionary bias, Oakley’s book is a helpful analysis of fossil tools.¹⁵ He has presented many detailed illustrations of various tool types found near particular skulls. Impressive beauty and skill are seen in the Acheulian hand-axes supposedly formed by Swanscombe man—a fossil believed to antedate the Neanderthal cave types. On the other hand, tools attributed by Oakley to the Africa ape-man (p. 112) resemble the naturally chipped rocks (“eoliths,” p. 12) so closely that one wonders if they are really tools or simply freaks of nature.

Attributing one certain tool to a specific fossil is not always feasible. How can one be sure that the creature buried near the tool actually formed it? An arrowhead found in the skull of a wild pig probably was used by a hunter to kill the pig. But the question becomes more hazy and yet more acute in the case of a tool associated with an ape-like creature. Did the creature make the tool, or was the tool simply buried near the creature, having been formed by another organism existing contemporaneously? This built-in problem has led to endless controversy about the famous South Africa ape-men. Some workers like Robinson, consistently believed they were able to use, but not to make tools:

I submit therefore, that there is no good evidence in support of the thesis that australopithecines were stone toolmakers but that there is very pertinent evidence against it, favouring the idea that this group consisted essentially of tool-users.¹⁶

On the contrary, Leakey originally believed that the East Africa man group of Australopithecines were the builders of tools found in the Oldowan deposits, as this quotation and picture caption indicate:

Such a being, who set about shaping the raw materials of nature in a regular pattern to suit his needs, was the one worthy to be considered the earliest human. And at last we have found him.

I call him *Zinjanthropus*, or “East African Man.”

Sharpened pebbles enabled *Zinjanthropus* to skin animals. He made the tools by chipping jagged cutting edges.¹⁷

In the mid-1960’s, however, Leakey discovered remains that were more human in character at **deeper levels** than the bones of his East Africa man. These new finds caused him to change his mind, attributing the tools to the new skull

(which he has named *Homo habilis* meaning "Handy man"), and he has finally assumed that *Zinjanthropus* was one of the non-tool-making Australopithecines:

The subsequent discovery of remains of *Homo habilis* in association with the Oldowan culture at three other sites has considerably altered the position. While it is possible that *Zinjanthropus* and *Homo habilis* both made stone tools, it is probable that the latter was the more advanced toolmaker and that the *Zinjanthropus* skull represents an intruder (or a victim) on a *Homo habilis* living site.¹⁸

Aside from the fact that a reappraisal such as this is highly commendable in the face of new evidence, it demonstrates that gross misunderstandings of culture can arise even when tools and bones are buried together in the same sedimentary deposit. It is obviously impossible as yet to assess the character of either fossil-East Africa man or Handy man. The tools of that layer might have been fashioned by East Africa man, by Handy man, by both, or by neither.

Exploring the last option, perhaps both Oldowan fossil types represent extinct non-humans, and the associated implements were accordingly made by a true man whose skull has not as yet been discovered. Such confusion, in this particular instance, shows that tool culture, good evidence as it is, cannot give unequivocal support for the intelligence or humanity of a particular skull.

Brain Size

Although it is tempting to assume that brain size in a fossil creature (as calculated from the cranial volume) would be an obvious index of its intelligence, such is not the case. Absolute, and even relative, fossil cranial volume may have little correlation with mental ability as Mayr has asserted:

Attempts have been made to measure the attainment of this *Homo* level in terms of brain size. This method is fraught with difficulty. First of all, brain size is to some extent correlated with body size. If, for instance, a large gorilla should have a brain of 650 cc. this is not at all necessarily equivalent to the brain of a fossil hominid of 650 cc., if that hominid were much smaller than a gorilla. If the brain of the gorilla averages one-fourth larger than that of the chimpanzee, it does not mean that he is on the average 25 per cent more intelligent. The correlation between brain size and intelligence is very loose. There is good evidence that the brain size of late Pleistocene man may have averaged larger than that of modern man. If true, this does not mean necessarily that there has been a deterioration of man's intelligence since the Pleistocene for

intelligence is determined not only by brain size. It is, of course, still unknown what neurological structures affect intelligence but the folding of the cortex and all sorts of specializations within the cortex appear to be as important as size. It is therefore dangerous, in fact outright misleading, to use size as an absolute criterion and to say that the *Homo* state was reached when brain size reached a level of 700 or 750 cc.¹⁹

Adult human beings may possess the largest brains among the primates, but they are surpassed in "relative brain size" by others. For various primates, Shultz²⁰ has divided the cranial capacity in cubic centimeters (cc) by the total body weight in grams (g) to yield percentage figures of relative brain size: cranial capacity (cc)/body weight (g) x 100 = relative brain size.

Shultz showed accordingly that man has a high relative brain size (2.02) which is larger than that of the gibbon (1.94). But even such a parameter cannot be used as an absolute indicator of humanity, because the squirrel monkey, *Saimiri orstedii*, has a relative brain value of 2.97—even higher than that of man!

Brain size and intellect among living peoples have been thoroughly explored by Clark²¹ who reported that skulls from men of normal intelligence vary in cranial capacity all the way from 900 to 2,300 cc. He cited the report of one apparently normal human being whose brain was only 720 cc, a surprising figure since the cranial capacity of a gorilla has been recorded as high as 685 cc.

Coon²² presented a photograph of a living aboriginal woman (cranial capacity estimated as less than 1,000 cc) on the same page with that of a Chinese sage of cranial volume nearly 2,000 cc—yet both individuals are obviously human and contemporary.

Weidenreich²³ showed that there was great disparity between the calculated brain volumes of famous and talented authors—Anatole France at about 1,100 cc and Jonathan Swift at about 2,000 cc. It may be safely inferred from such data that brain volume cannot be used to estimate intelligence even among living men, as Clark has aptly summarized:

. . . so far as it has been possible to apply appropriate tests, there is within such limits no marked correlation between the brain size and intelligence. . . . To the palaeo-anthropologist this lack of correlation is particularly disconcerting, for it means that he has no sure method of assessing the mental capacity of extinct types of hominid simply by reference to cranial capacity.²⁴

Speech and Language

The facility to mimic sounds or words, present in such birds as the parrot and the parakeet, does not show original linguistic ability. Amazing transfer of information through the dance is reported from the bee hive, but here too, no suggestion of reflection or abstract conversation among the bees exists. If speculations about possible vocal contact among porpoises are presently ignored, it can be safely asserted that man is unique in his capacity to communicate ideas by verbal symbols.

Unfortunately, no known technique of fossil analysis can reveal the probability of speech. Some workers attempt to judge this quality by estimating the musculature of the mouth and throat in reconstruction—but such studies are at best only speculative.

Evolutionary stages between the simple communication in animal societies and the complex speech patterns of man have not been discovered. Some authorities believe there is a qualitative difference between human communication and that of animals—something akin to a quantum jump, as expressed by the British neurologist, Macdonald Critchley:

It was implicit in this particular hypothesis as to evolution that differences between human and animal structure and function are matters of degree. Were this principle to be firmly established, then it would be difficult to avoid the idea that animal communication leads by insensible gradations to the faculty of speech in man. There are numerous linguistic objections to this view however. It is important to realize, too, that language does not stand alone in this matter and that there are other weighty considerations which lead to the well-nigh inescapable conclusion that some potent qualitative change occurs at a point somewhere between the anthropoid and *Homo sapiens*. . . . No “missing link” between animal and human communication has yet been identified.²⁵

Similar opinions are presented by Lord Brain, former president of the British Association for the Advancement of Science:

It is important to remember that man is different from other animals and that scientists should not think of animal behavior in human terms. At present, at any rate, we cannot imagine what an animal perceives but we can avoid thinking that this is like our own ideas or experiences. Man's relationship to his fellows and to the universe is uniquely different from that of any other animal. He faces different problems and solves them in different ways. Man's superiority is due to his intelligence, and his ability to manipulate the objects in the universe around him. These manipulations help him to increase his perception

—by use of a microscope, for instance—an increased perception in turn aids his manipulations. Most important of these manipulations is the use of verbal and printed symbols which we call language. Of all known life forms, only man is self-conscious. Only man is aware of himself as a part of the greater world, and only man has ideas of right and wrong and theories concerning his feelings.²⁶

2. The Absolute Depth Sequence of Certain Hominid Remains

Despite the symphony of problems under the previous topics, some anthropologists have continued to apply the labels of “primitive” or “advanced” to fossil man-like types, and have thereby attempted to illustrate the supposed history of human evolution. Dates have been applied to specimens in keeping with the usual stratigraphic assumptions.

Problems of uniformitarian geology versus catastrophism, and dating assumptions versus the young earth concept have been discussed adequately by Morris and Whitcomb²⁷ and elsewhere in previous volumes of this journal.²⁸ It is sufficient here to state that not all qualified scientists agree to the uniformitarian dating assumptions, or agree to the concept of gradual fossilization over vast epochs of time.

Such words, however, as “Pleistocene,” “Oligocene,” or “Second Interglacial” are bantered about in the semi-popular and scientific writings of anthropologists as if the designated time periods were scientific verities. The particular term “Second Interglacial,” for example, will be applied to a layer containing a fossil, but the reader is given little or no exact information about the absolute depth (below surface) at which the fossil was found or the physical condition of the confining strata.

Uniformitarian time-philosophy has thus become so completely ingrained that many authors gloss over the whole topic of fossil depth. Some authors will list a few animal bones found with the supposed man, and then give the reader the uniformitarian name for the layer—e.g. “Mid Pleistocene.” Such information is less than adequate for any serious student of paleontology, and it certainly does not satisfy the catastrophists' desire for empirical data.

The field of anthropology is in dire need of an objective survey in which factual data, along the following lines will be presented for each fossil hominid:

- 1) depth of finds,
- 2) condition of strata,
- 3) number of kinds of bones discovered,
- 4) tools or other artifacts related to the layer,
- 5) results of appropriate dating analyses, etc.

Tabulated information of this sort is sorely needed before a scientific approach to fossil man can be initiated. Cousins²⁸ has taken a pioneer step in this direction with publication of his work *Fossil man*. In this small treatise, one finds a useful atlas of skulls with numerous photographs, drawings, excerpts from original literature, and descriptions of the bones.

When a worker does wish to establish the depth position of a fossil, he must be certain that it was deposited when the original stratum formed. Some human remains are obviously "intruders" to a particular layer—having been buried by their peers long after the stratum was deposited. The paleontologist tries to find evidence of ceremonial burial, or tries to determine if the specimen was actually engulfed in the original sediments.

Certain structural features may aid in answering the question. The absolute depth may be of significant help in itself. A fossil discovered beneath 65 feet of gravel, for instance, can hardly be attributed to artificial human burial. A fossil cemented conformably in a firm matrix of limestone or breccia also bespeaks natural deposition.

Chemical analysis of the fossil may provide additional, valuable information. Fluorine occurs in most ground waters as the fluoride ion which is gradually absorbed and fixed". . . in the phosphatic material matter of bones and teeth buried in permeable formations."³⁰ Oakley, the originator of this dating technique, has clearly foreseen its problems and limitations:

The fluorine method is most suitable for the relative dating of bones in gravelly or sandy alluvial deposits in temperate regions. It is applicable to some extent where the containing deposit is alluvial clay, but it is of little or no use in cave-earth or other cave deposits where calcite seams have prevented the percolation of fluorides. The method is not reliable in tropical or volcanic soils. . . . The fluorine content of fossil bones increases with their geological antiquity, but at a rate which varies from site to site, being dependent on the hydrological conditions, climate, type of matrix, and amount of fluorine in circulation. . . . It cannot be emphasized too often that fluorine analysis is not a means of estimating the absolute ages of bones beyond the limits of carbon-14 (as one might have falsely gathered from some popular expositions).³¹

In this same reference, Oakley described other, relative, chemical dating methods based on uranium deposition and on the disappearance of nitrogen from buried bones with time.

The fluorine method is good only for relative dating and then only at one particular site.^{31,32,33} The method finds its greatest value however, in

this very manner. If a given fossil contains the same amount of fluorine as other bones near it in the stratum, it was probably buried naturally and its position is probably valid. If a particular skull gives very low percentages of fluoride, while nearby bones have a significantly higher fluorine content, one might logically infer that the skull was buried some time after the fossil layer itself had formed.

Based on these considerations, several pairs of fossil hominids will presently be studied. In each case, both fossils of the pair were found in approximately the same site or region. One member of each pair is believed (in terms of evolution theories) to be "primitive" or possibly "pre-human," while the other is more like modern man. It will be instructive to ascertain the depth positions of each, and to relate these data finally to the problem of man's origin.

Zinjanthropus and Homo habilis

Zinjanthropus (East Africa man) was discovered in 1959 by Mary Leakey, wife of anthropologist Louis S. B. Leakey. The skull was found embedded in the strata of a canyon, the Olduvai Gorge, which ". . . slices through 300 feet of sediment covering the bed of a prehistoric lake"³⁴ in the present country of Tanzania.

In his 1960 article, Leakey mentioned the "Bed I" stratum in which East African man was found in the bottommost layer, with note made of so-called "Bed II" deposits starting from about 40 to 100 feet above Bed I, above which are still higher formations.³⁵ Bed I evidently is of considerable depth, because Leakey's technical report³⁶ gave the position of the skull as approximately 22 feet below the upper limit of Bed I, as follows:

An extensive and rich living floor of approximately 1-2 in. in thickness has been uncovered. It rests on a bentonitic deep-water clay and is immediately overlain by a consolidated deposit of water laid volcanic sand. This living floor lies some 20 feet below the uppermost surface of Bed I.³⁷

The skull was found lodged in the soft rock in the process of being eroded from the cliff, ". . . contraction of the rock had cracked the fossil into more than 400 fragments."³⁸ After assembling the pieces, it became apparent that the skull shared some bony resemblances to man and yet some "primitive" traits.

Like man, the skull had large, flat-crowned molar teeth together with small incisors and canines. The forehead region, however, was flatter than that in modern man, ". . . the flat forehead is primitive, even apelike."³⁹ And again, "Our man also had a sagittal crest, a bony ridge crowning the skull, that is seen in certain of the lower primates and some near-men."⁴⁰ The cra-

nial capacity of East Africa man is estimated at 530 cc.⁴¹

But *Homo habilis* (who shall here be called "Handy man" to avoid taxonomic commitment) was discovered at a **deeper** layer. As Leakey reported, "In addition to the excavations at this main site, a second site has been located, not far away, at what appears to be a slightly lower level of Bed 1."⁴² In this second and deeper fossil site were found a hominid mandible, parts of two other hominid mandibles, skull fragments, teeth, two clavicles, a part of the left foot, six finger bones, and two ribs.⁴³ Leakey gave attention to one object:

Perhaps the most remarkable object from his second site (F.L.K.N.N. 1) is a genuine bone tool (fig. 4). This would appear to be some sort of a "lisseur" for working leather. It postulates a more evolved way of life for the makers of the Oldowan culture than most of us would have expected.⁴⁴

The teeth of Handy man are described and they are **not** like those of South Africa ape-man, but are more like the teeth of modern man, "The first molar is well worn and has a general cusp pattern reminiscent of what can be seen in some recent Australian Aborigines, but it is of course larger."⁴⁵

A portion of the original report of these deeper fossils is of particular interest:

The two parietals are especially remarkable because, although they apparently belong to a young individual only twelve years old (or less), they are larger than those of *Zinjanthropus*. They are remarkably thin, and exhibit no sign of a sagittal crest or of any marked temporal line. The lack of both these may, perhaps, be due in part to the youthful age. Nevertheless, these parietals suggest that we are dealing with a hominid with a larger brain capacity, as well as somewhat less specialized, than *Zinjanthropus*.⁴⁶

Tobias calculated the possible range for the cranial capacity of Handy man to be from 642.7 cc to 723.6 cc with an average value of 680.8 cc. This is, of course, significantly greater than the 530 cc of East Africa man. Tobias commented,

All these values lie in the area between the largest known australopithecine (530 c.c.-600 c.c. as the estimate for an adult corresponding to the Taung child, Tobias 3) and the smallest known *Homo erectus* capacity (775 c.c.).⁴⁷

While the intellectual-spiritual status of neither creature can be determined with certainty, it is interesting that the Handy man fossils, considered more "modern" on several accounts by evolutionists, lie **deeper** in the strata of Olduvai Gorge than the skull of the supposedly more "primitive" East Africa man.

Neanderthal and Swanscombe man

There are many cave sites in Europe, Africa, Gibraltar, Palestine, and elsewhere that have yielded skulls and many other bones of so-called Neanderthal man. From such plentiful fossil material, specialists have reconstructed entire skeletons, and completed detailed studies on body structure.⁴⁸ The anatomy of Neanderthal man has been summarized as follows:

Body of short stature but very massive. Head very large, with facial region much developed in comparison with cerebral region. . . . Skull much flattened; orbital arches enormous, forming a continuous ridge; forehead very receding; . . .

Face long and projecting with flat and receding malar bones. . . . Orbits very large and round. Nose very large. . . . Lower jaw strong and chinless. . . . Dentition massive, structure of black molars retaining certain primitive characters. Vertebral column and limb bones showing numerous simian characters and indicating a less perfect bipedal or upright carriage than in modern Man. Legs very short. Brain capacity averaging about 1,450 cubic centimeters. Brain formation presenting numerous primitive characters, especially in the relatively great reduction of the frontal lobes and the general pattern of the convolution.⁴⁹

This description by the noted fossil students Boule and Vallois contains both fact and philosophy. It is apparent, nonetheless, that evolutionists believe Neanderthal man was "primitive" in structure, if not also in behavior. Both of these points are debatable, since it is not permissible on strictly scientific grounds to call a bone "primitive" just because it varies in shape from that of modern man.

As has been noted, a "primitive" creature may have been completely non-related to man and hence not a primitive ancestor at all. Or else the supposedly "primitive" individual may have differed only in form, but not in intellect or the other spiritual qualities which mark mankind. In either case, it is more accurate to say that Neanderthal simply differs from modern man in these particular ways and others.

The Neanderthal man had a cranial capacity as large or larger on the average than that of modern man, although this also is an inadequate criterion of judgment.

Concerning behavior, Oakley⁵⁰ presented plates of the so-called "Mousterian" tool industry that is believed to be the product of Neanderthal man. These tools are admittedly well-shaped and, if made by the Neanderthals, are evidence of noticeable skill and craftsmanship. In one particular cave that contained Neanderthal remains, bear skulls were found systematically

stacked—an occurrence that Howells⁵¹ suggested might indicate some form of worship as with the Menominee Indians of today.

The mental status of Neanderthal man in relation to modern man cannot be determined, although it can be stated that his bones are plentiful and are somewhat different than corresponding bones of modern man. Furthermore, it is clear from writings of evolutionists that this creature has been judged as “primitive” in terms of developmental theory. The association of Neanderthal fossils with particular animal remains (certain extinct elephant, hippopotamus, and rhinoceros types)⁵² has caused historical geologists to place the creature in the supposed “Mid Pleistocene” and “Upper Pleistocene” periods of uniformitarian geological theory.^{53,54}

A knowledge of the facts and theories surrounding Neanderthal man is a prelude to the study of Swanscombe man. In 1935, Marston (an English dentist and amateur archeologist) found, as Lasker stated:

... several pieces of a skull deep in a stratified deposit of the 100-foot terrace of the Thames River. The circumstances of the find were investigated and confirmed by a committee of the Royal Anthropological Institute.⁵⁵ These bones were buried to a depth of 24-26 feet in the gravel of the Thames river at Swanscombe, Kent.^{56,57}

Three bones of the skull were found at different times—the occipital and both parietals.^{58,59} Although the skull is not complete, cranial capacity has been estimated at 1,325 cc.^{60,61}

The character of these deeply buried bones is remarkable, as evidenced in the following excerpts quoted from various anthropologists:

There is nothing in these bones to distinguish them from those of *Homo sapiens*, except, perhaps, their thickness. (Broderick)⁶²

The two bones, in excellent condition, appeared at first sight very similar to those of modern man and very different from those of Neanderthal Man. In particular, two very typical characteristics of the latter—the elongation of the occipital into a “chignon” and the presence on this bone of a relatively marked torus—are totally lacking in the Swanscombe skull. (Boule and Vallois)⁶³

As far as these go, little except unusual thickness would appear to distinguish the remains from the corresponding parts of modern man. (Lasker)⁶⁴

If these women were not sapiens, neither are many of the living female Australian aborigines and New Caledonians, whose skulls Steinheim and Swanscombe resemble in grade, but not in line. (Coon, speaking of both Swanscombe and Steinheim skulls)⁶⁵

Fossils discovered near Swanscombe bones in the Thames terrace included the extinct elephant and rhinoceros⁶⁶ that are related to the supposed “second interglacial” time period.⁶⁷

Tools found near the Swanscombe specimens included over 600 artifacts of the Acheulian type.^{68,69} The well-formed Acheulian hand axes reputed to have been made by Swanscombe are pictured by Oakley.⁷⁰

On the basis of fluoride and nitrogen percentages, it can be reasonably inferred that the Swanscombe bones were a valid part of the original gravel deposits and probably do not represent a later burial:

(From a table by Oakley⁷¹)

Specimen	% Fluoride	% Nitrogen
Modern Bone	0.01	4.0
Neolithic Skull	0.3	1.0
Swanscombe Skull	1.7	traces
Bones of fossil mammals from Swanscombe gravels	1.5	traces

It can be seen here that percentages of fluorine and nitrogen for both Swanscombe and nearby animal fossils are similar, whereas the amount of these two chemicals in Swanscombe and its associated animals differs greatly from corresponding percentages in modern bones or even more “recent” fossils such as the Neolithic Skull. After considering these chemical and stratigraphic evidences, Clark concluded:

Taking all the evidence into account, it may be affirmed that in no other example of Paleolithic man is the dating more completely attested than it is in the case of the Swanscombe bones.⁷²

Lasker also asserted:

Furthermore, fluorine analysis of the human bones indicates a degree of fossilization comparable to that of the Middle Pleistocene animal bones from the same 100-foot terrace. Here we have well-attested evidences of an antiquity greater than that of any of the Neanderthalian or Neanderthaloid specimens known.⁷³

Considering their truly “human,” or “modern” character (from the standpoint of evolutionism), the position of the Swanscombe bones is significant—deep in the fossil strata, **deeper** than nearly all Neanderthal materials. As in the case of East Africa man and Handy man, there is with Swanscombe another instance in which a specimen of supposedly more “modern” character is found deeper than its reputed “ancestors.”

Neanderthal and Fontchevade man

In 1947 Mile. G. Henri-Martin undertook excavation of a deposit at Fontchevade in southern France. This cave and its entrance had been pre-

viously studied. The superficial strata had yielded stone tools of Mousterian (Neanderthal) type. In the upper part of the cave deposits, as Coon related, Mile. Henri-Martin had:

... found Mousterian artifacts of a kind characteristically made by Neanderthal men, but no human remains. Below this level lay a limy crust, which not only effectively sealed off what lay below but also indicated a considerable time gap between the two layers.⁷⁴

Lasker stated:

It is believed that the cave roof extended over this part at the time these men lived, because the layer was completely sealed off by an overlying layer of stalagmite from the former ceiling of the cave. Above the stalagmite were strata containing stone tools of Mousterian type (the culture of Neanderthal man) and later Paleolithic types.⁷⁵

The thick, limy layer seemed to be the floor of the cave mouth. Actually, it was a layer of stalagmite which had formed when the cave mouth was enclosed. Mlle. Henri-Martin penetrated the stalagmite layer and under it found 7 meters of deposits⁷⁶ in which, at a depth of 2.60 meters, she discovered many animal fossils, stone tools, and two apparently human skull bones.

The one skull fragment was a patch from the brows (the frontal or forehead bone) about the size of a silver dollar⁷⁸ while most of the top of the skull of the second skull-crown was present.⁷⁹ A calculation of cranial capacity gave the value of 1,450 cc. or greater.⁸⁰

Not all the frontal bone was present, but from what exists, Fontchevade man did not appear to possess the supraorbital ridges typical of Neanderthal:

The forehead of Fontchevade Man was therefore shaped like that of Modern Man and quite differently from that of Neanderthal Man.⁸¹

Lasker concluded that:

The brow ridges are of feeble development, such as occur in European women today. . . . The one distinctive feature, it seems to me, is that the frontal region, especially of the first specimen, is apparently of modern type.⁸²

Animal fossils found in the deep deposit included mammalian bones and other "warm temperate fauna."⁸³ Coon⁸⁴ listed the following faunal members in the deposit: the extinct Merck's rhinoceros, fallow deer, bear, tortoise, and *Cyon*, a wild dog now found mostly in southern Asia. On this basis, uniformitarian theorists put these layers in the "last interglacial" period:

The animal fossils are of forms associated with a warm to temperate climate, hence consistent with a date of the last interglacial period.⁸⁵

Tools were also present in the deposits, sealed beneath the stalagmite floor:

The stone flakes found at the level of the skulls are of a coarse type called "Tayacian" and ascribed to the Lower Paleolithic.⁸⁶

Plates of representative Tayacian tools have been provided by Oaldehy.⁸⁷

Fluoride tests have been applied to the Fontchevade skull remains:

Oakley was asked to test the remarkable fossils found in a deeper level in a cave of Fontchevade, France. Their fluorine content and that of animals from the same level averaged 0.4 and 0.5. Fossils from the upper part of the cave had a fluorine content of 0.1 per cent.⁸⁸

Their content of fluorine is of the order of the animal bones in the lower layers where they were found, and greater than that of bones from above the stalagmite floor which sealed them over.⁸⁹

Finally, the fluorine test showed the skull bones to contain 0.4-0.5 per cent fluorine, as compared with a range of 0.5-0.9 per cent for mammalian bones of Tayacian date and 0.1 per cent or less for human and mammalian bones from the superimposed Aurignacian level. As in the case of the Swanscombe skull bones, therefore, the evidence for the antiquity of the Fontchevade skulls seems to be well assured.⁹⁰

Again the striking anomaly of a "modern" man buried **deeper** than the different or "primitive" forms is seen. The position of the Fontchevade man in the strata is unimpeachable. Custance has seen the importance of such data for the entire theory of man's origin and has summarized by saying that:

What this really boils down to, is that instead of a nice orderly series of fossil specimens, passing from very primitive to quite modern types, we in fact find the record supports no such pattern. Some of the lowest levels present us with fossil remains that are to all intents and purposes completely modern in appearance, while some of the latest levels throw up specimens which nicely fit the preconceived picture of what the earliest representatives of man are supposed to have looked like. Naturally there had been some tendency to disregard these misfits by questioning whether the levels at which they were found had been correctly reported-until Fontchevade.⁹¹

3. Conclusions

It is impossible to construct an evolutionary tree of man's origin for the simple reason that the intelligence and humanity of man-like fossils cannot be evaluated with certainty. Furthermore, fossils that closely resemble modern man are often buried deeper than those which are

supposed to be his ancestors according to evolution theory.

Following a creation origins model, these data have better fit and problems vanish. Bible creationism proposes that all men, modern or fossil, have descended from two ancestors who were formed quickly and miraculously from the dust of the ground (Genesis 2:7).

Then this pair, presumably rich in genetic endowment, may have given rise to variant morphological races through the mechanisms of mutation and selection. Before, during, and after the great flood (Genesis 6-8), many of these truly "human" types may have undergone burial and fossilization in sedimentary, cave, or volcanic deposits.

Furthermore, there may have been anthropoid (ape-like) "kinds" that were separate creations and of no biological relation to man. Some of these may have resembled man quite closely. Such non-human kinds may have also experienced extinction and fossilization. In this creation view then, there is no difficulty if relatively "modern" fossil bones are found beneath the "primitive" skulls.

Creationist students of anthropology can presently contribute to the discipline, if they will ignore the "ages" concept of the rock layers, and begin to correlate the absolute depth of fossils in the strata to their morphological patterns. A compendium of such information is greatly needed.

In either view, creationism or evolutionism, however, one key problem remains unanswered: What was the character, intellect, linguistic ability, and general spiritual capacity of each particular hominid or anthropoid fossil? In most cases as yet, this important question can be given no proper answer.

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NOTABLE PUBLICATION

The Case for Creation by Wayne F. Frair and P. William Davis. Moody Press, Chicago, Illinois, 1967. (Christian Forum Book, 95¢)

Mistakenly thinking that evolution is a dead issue, many Christians demonstrate an all too prevalent lack of understanding for the full scope of this evangelical dilemma. Even a number of those who have written and spoken on the subject of evolution have failed to grapple with the real issues. They have criticized the evolutionary position, but have not proposed an alternative which is biblically sound while being intellectually acceptable and open to experimental demonstration.

The Case for Creation is a critical examination of some of the theoretical foundations of modern evolutionary theory with excursions into specific areas of controversy. The book is designed to stimulate the development of a biblically sound alternative to evolutionary theory which will provide a satisfactory explanation for both scientific intellectual reasons.

Maintaining that evolution is not established fact, and the theories, hypotheses and laws of science are not necessarily absolute truth, the authors present a skilled argument for the Creationist viewpoint.

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LIFE IN A TEST TUBE?

WAYNE F. FRAIR*

Kornberg and Goulian succeeded in transferring from the living cell to the "test tube" chemicals necessary for reproduction of viral DNA. Scientists recognize the accomplishment not as the creation of a living organism, but rather as one enabling a DNA template to make a "copy of itself" in a test tube by a reproductive process normally occurring only within a bacterial cell. This process and the experimental procedures used are described in detail. Up until the present time, the closest approaches to "making of life" have been limited to establishment of proper conditions in which DNA or RNA polynucleotides from viruses or in living cells could manifest their potentialities.

Introduction

While many were discussing the first of the human heart transplants in mid December, 1967, suddenly the popular presses made the electrifying announcement that life had been created in a test tube. In a speech the night before, President Johnson had made the statement that we were about to receive one of the "most important news stories you ever read."

Reports in the popular news media preceded by some weeks the formal written scientific report. Even though certain of the early articles possessed an extravagant character—especially in the large print—they were on the whole remarkably accurate, probably because scientists themselves held a news conference to clarify what had been accomplished.

At the press conference, Nobel laureate Arthur Kornberg, presently of the Stanford University School of Medicine in California, and his associate, Mehran Goulian, a Stanford postdoctoral fellow, explained their research done in cooperation with Robert L. Sinsheimer of California Institute of Technology.

Essentially the announcement was that biologically active DNA (deoxyribonucleic acid) from viruses had been synthesized in the laboratory. Actually they did not manufacture viral DNA starting only with simpler non-viral chemicals, since as will be shown later, viral DNA was an essential part of their reaction mixture. Rather they succeeded in transferring from the living cell to the "test tube" the chemicals necessary for reproduction of viral DNA.

This scientific advance is considered to be important because DNA constitutes the hereditary material or genes which give to living things those characteristics earned from generation to generation. DNA characteristically is found in all organisms with the exception of certain viruses whose genes consist of RNA (ribonucleic acid). A synthesis using infectious RNA had been per-

formed two years previously by Sol Spiegelman and coworkers at the University of Illinois; and so this recent work which made use of DNA viruses was to some extent an extension of those prior results.

Important Factors of DNA Research

Investigator Kornberg has been engaged actively in molecular research with DNA synthesis for over a decade. In 1959 he shared a Nobel prize in physiology and medicine for discovering DNA polymerase, an enzyme which catalyzes the production of DNA. For this production to occur there must be a DNA template, an energy source, and the necessary building blocks (nucleotide forerunners or precursors). However, the resulting polynucleotide (DNA) would not exhibit biological activity like the parent template molecule.

The current success in producing DNA molecules which would manifest biological reproductive activity is based on several important factors. These are (1) purification of DNA polymerase, (2) selection of an ideal DNA template, and (3) utilization of a new polynucleotide-joining enzyme.

The DNA polymerase used by the Kornberg team in early experiments contained contaminating enzymes (nucleases). After the synthetic DNA was produced in incubation mixtures containing the polymerase, the contaminating enzymes would cause breakages in the new DNA. Thus the reproductive activity of DNA was destroyed. When the degrading nucleases were removed from the mixture, the purified polymerase led to production of DNA capable of reproduction.

DNA Organization

Exactly how DNA in the chromosomes of plant and animal cells is organized and controlled is not yet well understood. However, studies have indicated that DNA in the cell nucleus acts as a template for production of RNA which moves from the nucleus to the surrounding region (cytoplasm) of the cell. Here the RNA operates with the ribosomes and dictates the conformation of various proteins including en-

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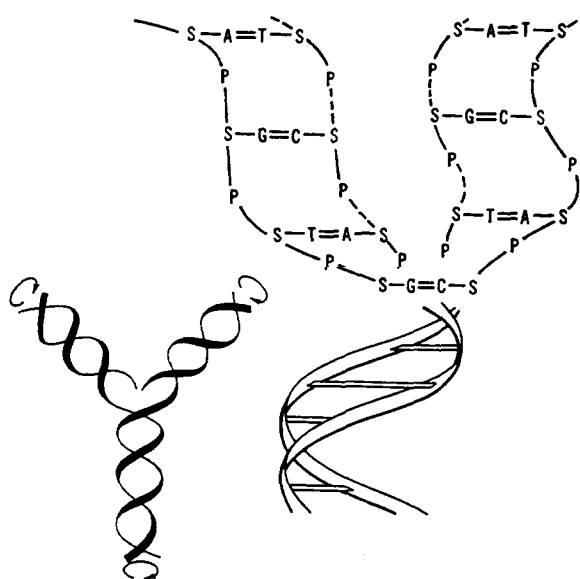


Figure 1. At left and bottom are diagrammatic views of the DNA helix. Above is a more detailed structure of DNA polynucleotide as it is reproducing. Each nucleotide is composed of Sugar, Phosphate, and a base, A, T, C, or G. (Courtesy Wiley & Sons, Inc.)

zymes which are essential for life of the cell and the organism of which the cell is a part.

The type of DNA widely discovered in various animal, plant, and human cells consists of two strands twisted about each other to form a helical structure. DNA resembles a ladder which has been twisted so that the two sides are spiral-shaped. The strands are joined together at the region of the rungs by hydrogen bonds. Each strand is called a polymer (poly, many; mer, parts) because it is composed of many repeating structural units. Each of these units is a nucleotide and so each polymeric DNA strand popularly is termed a polynucleotide.

DNA contains four types of nucleotides. All four contain a phosphate group, sugar, and a base. The difference resides with the bases, which are named adenine, thymine, cytosine, and guanine.

The structures of polynucleotides have been determined by physical and chemical means because they are too small to be visible. An electron microscope has been used for photographing strands of DNA, but cannot reveal the nucleotide sequence. The width of a DNA helix is 2 millimicrons, and it would take more than 12 million of these helixes side by side to equal one inch.

DNA and Proteins

In addition to functioning as a template for RNA production which leads to formation of vital proteins, DNA becomes a pattern for its own reproduction at appropriate times. When this

happens, the two polynucleotide strands separate. The linear sequence of bases in each strand will determine which nucleotides will be required to reconstruct the double-stranded condition. Where there is an adenine base, a thymine-containing unit moves in so that thymine joins with the adenine. Where the template strand contains thymine, an adenine unit will join.

When reproduction is complete, adenine (A) will be joined to thymine (T), and cytosine (C) to guanine (G). (See Figure 1) These specific combinations constitute a four-letter genetic alphabet which is A-T, T-A, C-G, and G-C. The sequence of these "letters" distinguishes one organism genotypically from all others. Proteins will be constructed according to the "orders" given by the arrangements of letters.

Proteins are composed of units known as amino acids, and they range in size from about 50 to 3,000 amino acids. It takes a sequence of three nucleotides to determine one amino acid. For production of a relatively small chain of 150 amino acids, a nucleotide sequence of 450 would be required. This sequence would constitute what popularly is termed a gene. It is necessary that the nucleotide sequence be preserved exactly in order that correct proteins be produced for maintenance of the life which is characteristic of each organism.

Minute Complexity Involved

Each organism contains within its genome not just a few genes, but in most cases thousands or millions. In the human body there are some 10 trillion cells, and each cell normally contains 46 chromosomes in its nucleus. Within the set of chromosomes of each cell, there are perhaps 3 million genes composed of nucleotide pairs numbering in the vicinity of 5 billion.

Cells of cows, mice, or corn each have a similar number. A single colon bacterium of *Escherichia coli*, which is about $\frac{1}{2}$ micron ($\frac{1}{50,000}$ of an inch) wide and 2 microns long, has a single chromosome containing a single DNA molecule. The extended DNA molecule is about 1 millimeter long (or about 500 times the length of the *Escherichia coli* cell).

Each of these DNA molecules contains about 10 million nucleotide pairs, which constitute the thousands of genes giving the organism its structural and functional characteristics. It should be pointed out that not all genes are operating at one time, but each functions at appropriate times during an organism's life history. The proteins called *histones* seem to have an important role in *regulating* gene action.

Does all this minute complexity, with the coordination of operation necessary, point to a supernatural designer and sustainer? Those who

accept the argument that design implies a designer say yes. Others say they believe that life was self-creating and is self-sustaining. Both of these positions are based on an individual's philosophical ideas which are not subject to rigorous proof. We shall say more of this later on.

Comparison of DNA and RNA

In most organisms DNA is a double-stranded helical structure, but there is considerable variation found among viruses. The best known DNA viruses, like smallpox, polyoma, T2, T4, and T6 have double-stranded DNA. Several groups of bacterial viruses carry their DNA in a single-stranded condition. Among RNA viruses, influenza, poliomyelitis and bacterial virus F2 possess a single RNA strand, whereas, in the Reo viruses, RNA has been found in the double-helical form.

Even if the genetic information is carried normally on a single nucleotide sequence rather than a double one, the complementary replica strand can be produced at the appropriate time. So it appears that the important fact is that some type of nucleotide is present whether it be RNA or DNA.

The structure of RNA is similar to DNA and differs from DNA in that (a) it normally possesses the base uracil instead of thymine, (b) carries an extra oxygen atom on each sugar portion, and (c) is usually single-stranded (whereas DNA is usually double-stranded).

The question whether nucleic acid (DNA or RNA) is required in all types of reproductive activity associated with living things still may be open; for there is suggestive evidence that certain disease conditions may be due to some type of "subviral" transmitting agent which is capable of reproduction. Scrapie, a disease of the nervous system, may be caused by such an agent.

Circular Viruses

The recent research of Goulian, Kornberg, and Sinsheimer involved use of one of the smallest of the viruses. It is called ØX174 and carries a single strand of DNA in circular form.

Original evidence, which came primarily from electron microscopy, was interpreted to mean that DNA molecules were linear with two free ends. Now it appears that some DNA's can exist in either circular or linear form. The polyoma virus contains a circular double DNA, whereas ØX174 has the single circular strand, which remains circular during the time the complementary second strand is formed.

DNA circles are not confined to viruses as once thought, for even the *Escherichia coli* DNA molecule has been found in a circle. It has been suggested that the circular condition could have an important part to play in reproduction.

In order to understand the significance of the research of Kornberg's team in relation to life in general and the creation of "test tube" life in particular, it is necessary to understand reproductive processes, especially of the material they utilized.

Reproduction in Complex Forms

Most plants and animals with which we are familiar begin as a single cell which divides and distributes its DNA equally to all daughter cells. The quantity of DNA in the sex cells (sperm and eggs) would be one half the amount in body cells. This is true for organisms such as birds, frogs, reptiles, mammals, and insects.

When speaking about creating life in a test tube, scientists usually are not thinking of anything as structurally complex as these. It is, however, possible to raise bird eggs in a glass incubator, frog eggs in a glass dish, and fruit flies in a bottle. Doing this involves the providing of an environment in which DNA can manifest its potentialities.

Creation of just a tiny fruit fly with its wings, eyes, legs, digestive tract, nervous system, reproductive system, muscular system, etc., involved proper alignment of some 10 millions of polynucleotide pairs in the DNA. Of course, not all forms of life are this complex, but even so up to the present time, the closest approaches to the "making of life" of any kind have been limited to establishment of proper conditions in which DNA nucleotides could manifest their potentialities.

Bacteria and Viruses Considered

When we consider bacteria we find a group which largely is invisible without magnifying equipment. *Escherichia coli* is a good example. About 10,000 of them together on one plane would be required to form a spot large enough to be within the range of visibility of the unaided eye.

Bacteria reproduce asexually. When conditions are right for their multiplication each cell splits to form two cells. Here again the nucleic acid is distributed equally to the resulting cells so that each has the same genetic material. As a result all cells so produced will manifest a similar phenotype-looking and acting like others of their species.

When we consider viruses, we find doubt about their being alive at all; for one of the characteristics of life involves the ability to reproduce. Viruses are not known to live outside of living cells except in the sense of surviving passage from cell to cell, for their activities go on only within cells.

It has been suggested that viruses, which are relatively simple structures, compose a link be-

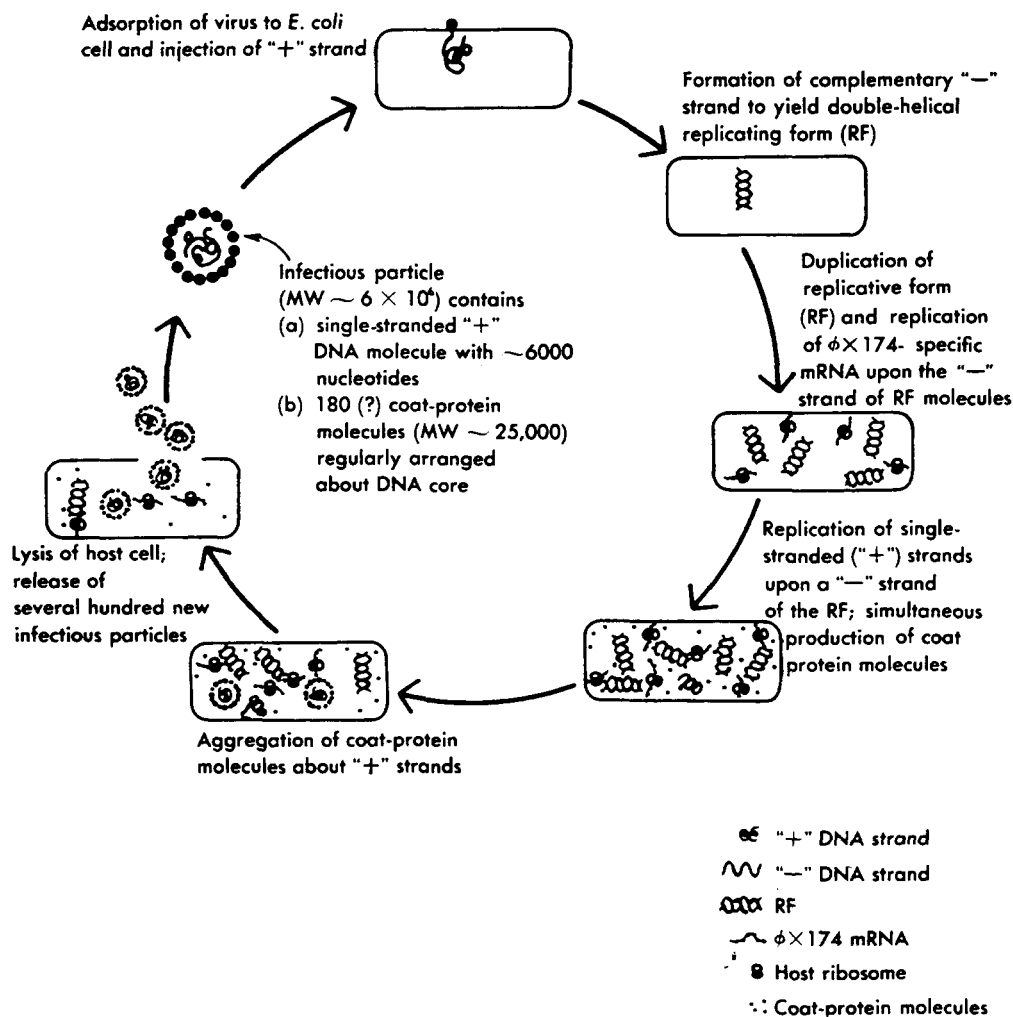


Figure 2. Life cycle of the $\phi \times 174$ virus. This virus employs a circular DNA. The diagram shows only a small portion of the (+), (-), and (RF) circles. MW, relative Weight of a single particle or molecule, the hydrogen atom being approximately one. (from Watson)

tween nonliving and living substances. This does not appear likely because a virus lacks reproductive ability. Outside a living cell it is subject to forces which eventually will destroy it. Inside a cell its only function appears to be the supplying of information necessary for its own multiplication **at the cell's expense**.

So a virus may represent what was at one time a normal cellular constituent. Maybe as a result of some change it "escaped" from the cell's control while still requiring the cell for reproduction. Whether or not this is true, it does not seem likely that viruses existed prior to cells since viruses need cells for their perpetuation.

Variation, Reproduction of Viruses

Viruses show great variation in size and structural complexity; the largest virus approaches the size of very small bacteria. All viruses differ from cells in containing only DNA or RNA,

whereas all cells have both DNA and RNA as discussed previously. The nucleic acid of viruses is in the center and is surrounded by a protein coat.

In order to reproduce, the virus must transfer at least its nucleic acid to the appropriate host cell. If the core is DNA, then the DNA will serve as a template for RNA, which works with the cellular machinery such as ribosomes and enzymes for producing the viral proteins. Also the DNA will serve as a template for its own replication.

If the viral core is RNA it will function directly in producing viral proteins and replicating more RNA. In both cases the specific nucleic acid core material and proper viral protein shell will be produced. These then join to form mature viral particles which will escape from the cell and attack more cells.

In addition to production of nucleic acid and coat protein, often one or many enzymes will be formed as well. In one way or another, these will be necessary for successful viral multiplication. For instance, if the cell has a heavy wall around it, the viruses could be trapped. Therefore many viruses have a gene coding for a cell-wall destroying enzyme which will cause the bacterial cell to lyse (or split open) at the appropriate time.

Life Cycle of a Virus

Before considering in some detail what Goulian, Kornberg, and Sinsheimer reported, it might be wise to discuss the normal life cycle of the virus they used, namely ØX174. (See Figure 2.) The designation Ø indicates that this virus is a phage or bacteriophage (phage refers to eating or consuming). Phages destroy bacteria.

The phage, ØX174, is one of the smallest viruses and has a particle weight of only 6 million which is the size of some very large protein molecules. The viral core consists of a single circular strand of DNA consisting of 5,500 nucleotide residues. This is 5 or 6 genes. Surrounding this DNA core is a coat of protein molecules.

The virus is adsorbed to the cell wall of a bacterium of *Escherichia coli*. The DNA, which is called a (+) strand is injected and the protein coat remains outside the bacterial cell. Once the single (+) strand of DNA is inside the cell, a complementary (–) strand of DNA is formed, thus producing a double-stranded helix. This double-stranded DNA is called a replicative form (RF).

The RF itself is duplicated forming more RF. Also there is replication of specific ØX174 RNA molecules upon the RF molecules.

Then there is a replication of single-stranded (+) strands upon the (–) strands of the RF. At the same time, protein coat molecules are produced.

The protein coat molecules then aggregate around the (+) strands. Thus mature virus particles are formed.

The cell wall of the bacterium lyses and several hundred new infectious viral particles are released.

The new particles each in turn can infect a cell of *Escherichia coli*, and cause it to produce more viral DNA and viral protein and then to release several hundred more viruses. Thus the process continues.

Experiments Duplicated Viral Activity

The recent experiments were set up to duplicate outside the cell what normally happens inside. To prepare for the experiment, the researchers treated intact viruses with phenol in

order to remove protein coats, thus leaving the pure DNA or what would serve as (+) strands or circles.

From *Escherichia coli*, DNA polymerase and polynucleotide-joining enzyme were obtained and purified. More *Escherichia coli* cells were broken (by a sonic method); the fluid was centrifuged and the supernatant boiled. This supernatant solution, therefore, contained the soluble heat-stable materials from the bacterial cell.

The incubation mixture in which the first DNA reproduction occurred was composed of the following: ØX DNA, four nucleotide precursors (deoxynucleoside triphosphates, purchased from an outside source), DNA polymerase, joining enzyme, DPN (a hydrogen carrier), boiled *Escherichia coli* extract, magnesium chloride, potassium phosphate buffer, mercaptoethanol, and albumin. Incubation time was 180 minutes at 25° C.

During incubation the natural ØX DNA (+) circles served as templates for formation of complementary (–) chains, the DNA polymerase catalyzing polymerization of the (–) chain. As the nucleotide precursors joined to become units in the new (–) polynucleotide chain, they underwent certain changes including loss of some phosphate groups. The joining enzyme catalyzed the joining of opposite ends of the newly formed DNA (–) chain so that a duplex circle (RF) was complete (Figures 3 and 4). These circles were like RF isolated from infected *Escherichia coli* cells, except that the partly synthetic RF lacked supercooling found in natural RF.

Duplex DNA Circles Produced

The new duplex circles were exposed to a pancreatic DNase which broke one of them and led to their separation. The synthetic (–) strands could be separated from the (+) strands because in the incubation mixture thymine had been replaced by the unnatural, yet biologically active and heavier, bromouracil. When the material was centrifuged the bromouracil-containing (–) strands could be separated because of their greater density.

It was demonstrated by radioactive tests that the new (–) strands were not contaminated by (+) template strands. The (+) template material had been prepared with radioactive hydrogen (tritium, H³), and nucleotide precursors used for synthesis of the new (–) strands contained radioactive phosphorus.

The new (–) circles infected *Escherichia coli* cells. This had to be done using specially prepared *E. coli* since the DNA, which lacked the usual protein coat, was unable to penetrate normal bacterial cells. The specially prepared *E. coli* were without their cell walls and when they

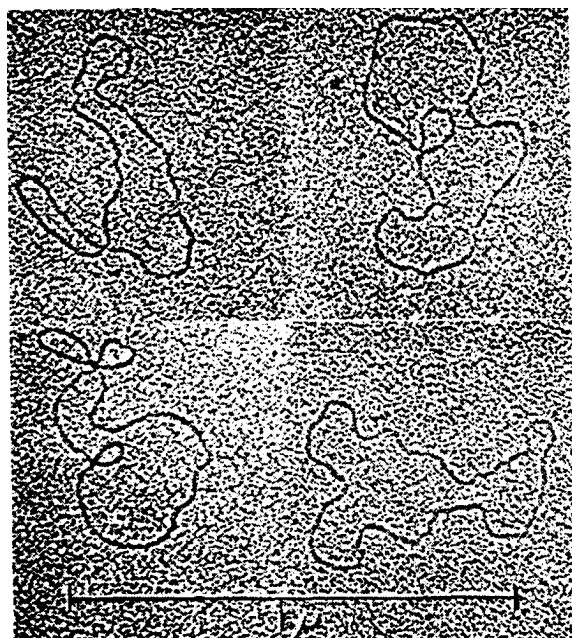


Figure 3. Electron micrograph of partially synthetic duplex circles. (from Goulian and Kornberg)

were thus altered DNA could enter. Under the laboratory conditions used in this research, bacterial cells without their walls are globular in shape and known as spheroplasts. The newly-formed DNA (—) circles infected spheroplasts and produced new intact viruses.

DNA Circles Infected Bacteria

The investigators also produced completely synthetic duplex circles by setting up an incubation mixture analogous to the one used previously. When the positive circles were separated, they could act as templates leading to the formation of RF within the *Escherichia coli* spheroplasts. Thus the researchers were able to perform an *in vitro* production both of infective (—) and (+) circles (Figure 5).

These experiments have demonstrated what might be occurring within the cells of *E. coli* after invasion by the ØX174 viral DNA. The investigators say it appears likely that the same enzymes utilized in their experiments are the ones used by infected *E. coli* cells to carry out the DNA polymerization and ligation of the ends of DNA strands. The enzymes they used were extracted from the *E. coli* bacteria, and the experimental environment with the boiled *E. coli* extract, etc., approximated conditions found inside *E. coli* cells.

Interpretation Evaluation of Research

To refer to this recent research development as “production of life in a test tube” is plainly a dramatization of the research story. Scientists

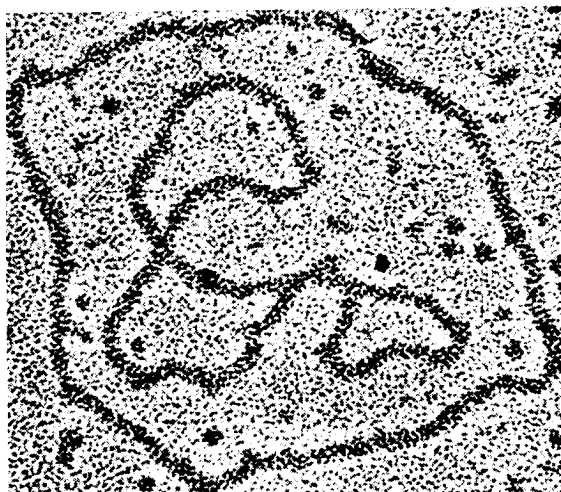


Figure 4. Two duplex circles of ØX174 DNA. One is extended, and the other is folded twice giving the appearance of 3 joined loops. Width of picture is approximately 500 millimicrons. Photo by Ron Davis of California Institute of Technology.

recognize the accomplishment not as the creation of a living organism, but rather as one enabling a DNA template to make a *copy of itself* in a “test tube” by a reproductive process normally occurring only within the bacterial cell.

However, the work probably does constitute the closest approach yet to what most of us think of when we say, “life in a test tube.” The research establishes an important step forward in our understanding and control of life, and could lead to improved treatment of various diseases including cancer as well as man’s gaining control over some hereditary conditions.

It probably is unwise to condemn the investigators involved in this recent project as recognition seekers. Even though their research may have been reported in extravagant terms, the men themselves are careful researchers. Their utilization of public media rather than only the technical press (in this case the December, 1967, issue of the *Proceedings of the National Academy of Sciences of the U.S.A.*) can be justified.

National funds channeled through government granting agencies over the past seven years in support of Kornberg’s research have amounted to about \$2,000,000. Because these were public funds, the taxpayer who understands what is being done will be more willing to see his money used to support such basic research. Thus Kornberg decided that the cause of science would be advanced by general publicity. He said,

I felt this work could be more easily interpreted for the public than some other things we have done. Lately I have become aware of the need for science to be better understood by the public, and I’ve had the feeling that we

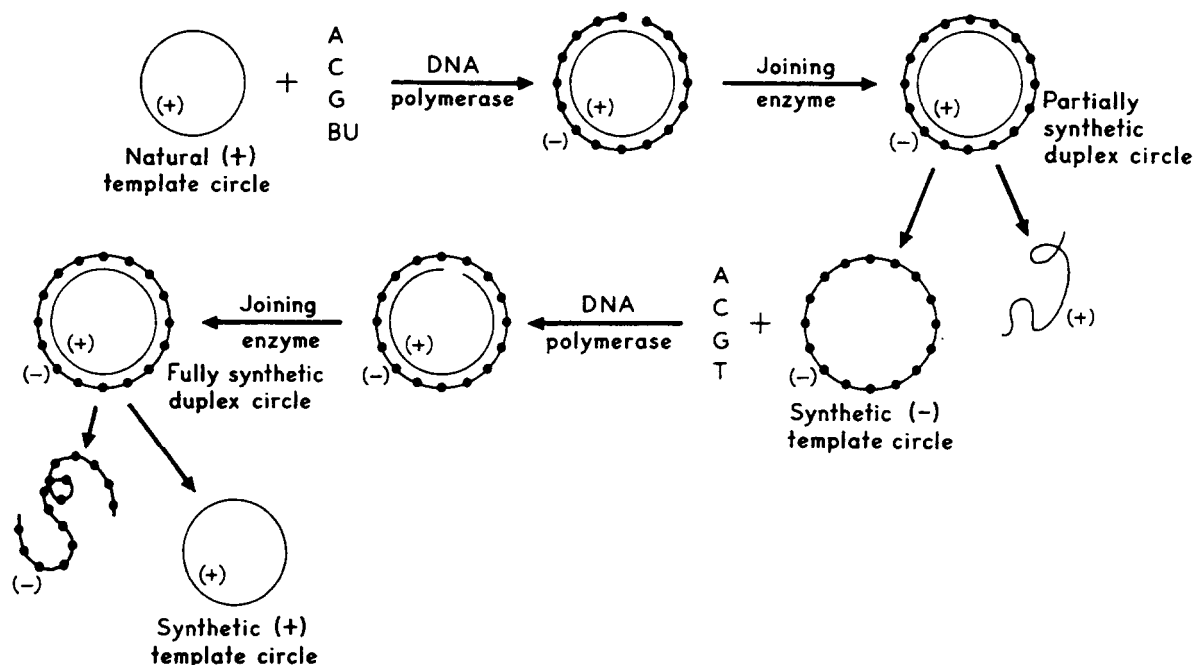


Figure 5. Enzymatic synthesis of viral ØX174 DNA. Both the synthetic (—) template circles and the synthetic (+) circles would infect bacterial cells, causing them to produce the appropriate complementary strands as well as the surrounding viral protein. Both duplex circles are considered replicative forms (RF). The letters A, C, G, BU, and T stand for the nucleotide precursors containing respectively adenine, cytosine, guanine, bromouracil, and thymine. (after Gouliau, Kornberg and Sinsheimer).

haven't always exploited our opportunities for gathering public support.

Most Investigators Cautious

Most scientific investigators dealing with phenomena associated with living things realize the complexity of life, and they realize the small part they actually are playing in clarifying some mechanistic details of how life maintains itself. We are increasing steadily our knowledge of the structure and function of DNA in reproducing itself and in producing RNA and the proteins necessary for life. But it should be pointed out that **all** living things, including the tiny ameba, possess hundreds and thousands of enzymes and almost none of the structure and stereo arrangement of these proteins even are known.

We know the amino acid sequences of a few proteins—these being various members of probably less than thirty protein families. We are not able, yet, even to read off the nucleotide sequences of DNA molecules. A few relatively simple substances like amino acids, polypeptides (or strings of amino acids), sugars, nucleotides and ATP (adenosine triphosphate, which is used in energy-releasing processes), and by use of special techniques even the very small protein, insulin, have been synthesized under laboratory conditions.

When we consider them in relation to living things, they are as a few spare parts compared to a giant machine. It is important to point out that because of the complexity of life, production of a self-reproducing organism from simple precursors does not seem to be within the grasp of scientists at the present time. This fact not only should challenge, but also should encourage a cautious optimism among those engaged in basic biological research.

Faith in God, DNA Considered

Some scientists have tried to use recent knowledge of DNA, RNA, and various phenomena of life to discredit faith in a supernatural being. Often the "god" of these individuals becomes the quest for truth. For some, science has become a religion which teaches men to worship products of the human mind.

On the other hand, there are those scientists including myself, who have realized that there is a spiritual dimension beyond the millimicrons and cubic centimeters used in DNA and protein research. One day, some years ago while I was in graduate school, one of my associates told me in unforgettable terms what had happened to him at midnight the day before. He said he felt all of a sudden as though he had reached the top of his materialistic ladder. "There must be something beyond this" his very nature told him.

It seems to me that faith in God is logical. There are many philosophical arguments, which—true enough—do not prove His existence; yet, when taken together, they do show that faith in a supernatural God is *logical*. Also such faith is *satisfying*.

Speaking of God, St. Augustine said, “Thou hast made us for Thyself, and our hearts are restless till they find their rest in Thee.” Some have said that God created man with an empty place that only He could fill. It is significant to me that belief in a supernatural being is found universally in all cultures, and as far as we know this always has been the case.

Relevance of Bible Indicated

The Bible indicates that the invisible things, from the time of creation, are seen and understood by the things that are made, and these point to God's power and deity (Romans 1:20). The story is told, that during the French revolution when some men were determined to remove churches, priests, Bibles, and everything that reminded people of God, that a farmer laughed when told this. When asked why he laughed, the farmer pointed upward to the stars and said, “I was just wondering how you will get them down.” Psalm 19:1 tells us that the heavens declare the glory of God.

The Bible indicates that Jesus Christ actually is the creator of Genesis 1:1 (see John 1:1, 14; Hebrews 1:2; Colossians 1:16), and it says in Colossians 1:17 that in Christ all things hold together. I think this can refer to the stuff of life. Modern physico-chemical studies have given us considerable knowledge of the attractive forces existing within molecules and of the bonds holding molecules together. I thank God for this knowledge, because with it we can understand better His creation.

There is something about looking at starry “diamonds” glistening in the night sky, which

causes us to meditate on the greatness of the God who created them; but there is something about DNA and its operation which gives me a similar thrill. Here is evidence of the handiwork of a God concerned with intricacy.

The greatest complexity of which we presently are aware exists in living “protoplasm.” It seems to me that the human brain (probably the most complex organ in existence), if anything, would lead one at least to suspect the existence of a Higher Power.

Those of us who have experienced this Higher Power, in the person of Jesus Christ in our lives, have the most for which to be thankful. We can and do participate in various phases of scientific research, and we are thankful to God for all the new knowledge He allows us to obtain. We are analyzing components of living things and we are synthesizing some; thus we are learning more of His creative activity.

Will it ever be possible—starting with simple chemicals—to put together something alive, and have it maintain itself and reproduce in a test tube (or outside of a test tube)? This question remains unanswered. At any rate, as long as God ordains, we will go on researching and learning more about DNA and other aspects of His creation.

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THE ANCESTRY OF MAN

WILLIAM J. TINKLE*

The origin of man is not solved by history. Though examples of misrepresentation and fraud can be found, Christians should not be discouraged in their search for understanding of early man because of mistaken interpretations. Many instances are known of fossil forms which are like modern man, and which must be older than "primitive" man because of the rock strata in which they have been found. Too often evolutionists have assumed that which they attempt to prove. Scientists offer no basic discoveries for a compromise theory which some offer to harmonize science with Genesis.

Since there is wide disagreement as to the origin of the human race, whether man came up from the brute or directly from the plan and handiwork of God, some may think that his origin does not matter. Why tire the mind with a problem which is hard to solve?

One cannot deny, however, that the origin of a substance gives a clue as to its nature. Being shown a substance from a mine, we at once think it is a mineral, while something from a garden is classified as a vegetable. We could be mistaken but such is our first judgment and we usually have no reason to change. The same principle holds good in our estimate of the nature of man.

If man came from the animals, he still is a being who simply reacts to his environment and lacks an awareness of responsibility; while if made in the likeness of God, man has vast spiritual potentiality and is not content until he does that which he ought to do, even though at times he gives way to his fallen nature.

The origin of man is not solved by history, for the oldest written records do not narrate man's earliest experiences. They do, however, make it clear that man's residence on earth has not been a gradual, uninterrupted growth in civilization. Our admiration is excited by the sculpture, the poetry, and the architecture of ancient Greece; and we marvel also at the huge blocks of which the Egyptians built the pyramids, fitting them together with tight joints. If man's ability were simply a growth from primitive beginnings, it would seem strange that such a height was reached in ancient times with so little being added since that time.

Man Lived before Records

While no one knows the age of the human race, we know that man lived before the time of written records, and as a record of this era we turn to the skeletons, tools, and weapons of early man.

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Some Christians are inclined to turn away from human paleontology, contending that it is misrepresentation and fraud. Indeed, one skull, found near Piltdown in England, has been proved to be just that. In 1911-12 some fragments of a human skull found in a gravel bed and fitted together were pronounced to represent a man of the Pleistocene or glacial age. The bones were placed in the British Museum, plaster casts of the specimen were made, and it became one of the most famous "missing links" between man and ape.

But there was a mystery, in that the mandible (the jaw) seemed to be more apelike than the rest of the bones. Yet the majority of scientists maintained that the specimen was genuine and the casts remained in the museums and the pictures still were used in the textbooks.

In 1953 the bones were examined more thoroughly and it was proved that the mandible was that of a recent ape, stained brown with iron salts to make it look old, and the molar teeth had been filed down to make them appear human. The two molar teeth could not have been worn by use because they were filed in slightly different planes. It was a plain case of conscious fraud on the part of the one who placed the bones among the gravels, but we cannot be sure who that was.

Certainly it should not have taken scientists forty-one years to discover such a forgery. While not involved in the deceit, they had not made their tests carefully. An X-ray of the roots of the lower teeth had shown them to be short like human teeth; but a later picture, after fraud was discovered, showed them to be long and crooked like those of an ape. A test for fluorine had indicated that the cranium and the mandible had equal amounts of fluorine, thus making them contemporaneous; but a later test revealed that the jaw had almost no fluorine, or that which would be present in a fresh bone.¹

Piltdown Defended, Then Abandoned

It seems that the makers of these tests were influenced by the intellectual fashions. When it was fashionable to defend Piltdown man, tests came out in his favor; but when fashion turned against him the tests did the same. This agreeing with majority opinion, or interpreting according

to preconceived theory, will account for most or probably all the misinterpretation of human skeletons or artifacts.

Mistakes such as these have caused some Christians to turn away from all research of the relics of ancient man, considering it trivial or spurious. But if we scrutinize rather than minimize, emphasizing what has been found rather than the current interpretation, we find much which harmonizes with historic Christianity.

No doubt you have seen pictures of cavemen. When they are mentioned, peculiar features flash upon the walls of your memory: thick neck; uncombed hair; low, receding forehead; massive brow ridges; receding chin. These cave dwellers are pictured as short, stocky men who could not stand erect because the neck was bent forward and the knees could not be straightened. They seem to have had massive brute strength but puny minds.

The imagination is caught by this being [Neanderthal man] close enough to *Homo sapiens* to be called a man, but distant enough, in shape as well as in time, to appear in a way an "alien" in the sense in which the word is used by science fiction writers. Hence, many misconceptions are to be found in popular books, even textbooks, the most common being the one about the "brutish Neanderthals." Reconstructions show him as only a little better off than the big apes, and his tools (Mousterian) are described as "crude" by people who would not, to save their lives, be able to make them. The truth is, indeed, quite different.²

Of course Neanderthal man could not be a forgery because almost a hundred skeletons have been found in Europe, Asia, and Africa. Along with the bodies were placed their tools and weapons, for it was thought they would need them in the future life.³

Reconstructions Are Imagined

In making pictures of cavemen it is evident that the outlines are based partly upon the skeletons and partly upon the estimate of the artist. We have no data on how long early man wore his hair, how thick his lips were, or whether he usually closed his mouth. Such features, along with the clothes, make a person appear either stupid or intelligent.

Of course the clothes have gone into the limbo of decay, along with the wooden tools and weapons. While early man made many excellent drawings of animals, he has left practically none of himself. Thus the skeletons are the only reliable guides for the portrait makers, leaving the major features to be added from theory and imagination.

The first skulls of Neanderthal man to be dis-

covered were broken and ill-preserved at the base, where the skull rests upon the spinal column. Since the finders could not be sure about the neck, and since according to the theory of evolution this type should be a connecting link between man and ape, they guessed that it was like an ape's neck. But a very complete skeleton was found at Monte Circeo in Italy which showed that Neanderthal man **stood erect**. The head was not carried in front of the neck but rested upon it. It has been proved likewise that not all cavemen stood with their knees partly bent.

At present it is agreed that Neanderthal was a true man. That he was a little lacking in height but was well muscled is proved by the attachments of muscles on bones. The brain was as large as that of modern man—some anthropologists claim that it averaged a little larger. He built houses, used fire, and buried the dead surrounded by tools and weapons, indicating that he believed in life after death.

Another cave type, Cro-Magnon man, averaged six feet tall, was well proportioned and of modern type. These men were the artists who have won the admiration of the world by painting pictures of animals on walls and ceilings of caves.

We turn now to a different type of skeleton of which the first was found in South Africa in 1925 by Raymond Dart and was named by him *Australopithecus*, which means ape of the south. It soon became evident, however, that this name was not well chosen, for the newly discovered creature did not have the characteristics of an ape. The skulls and the fragments of skeletons present a problem, for the stature is small, the mandible is large and deep, and the chin is not prominent.

They are rather poor specimens of the human race but not specimens of apes at all. "They are not exactly like ours in every detail, but they are not at all like an ape's: they are *not halfway between*" (Italics in original).⁴ The teeth are typically human and it is evident from the hip bones and the base of the skull that *Australopithecus* walked erect.

Judgments as to the nature of *Australopithecus* should be considered tentative until more complete skeletons are found. It may be that problems will be solved, just as they were made clear in the case of Neanderthal man. If we allow modern genetics to guide us we may decide that this peculiar type from South Africa was not our ancestor at all, but a mutant type headed for extinction; for genetics has shown that the vast majority of mutations are harmful and that most mutants lose their lives because of their peculiarity.⁵

No Evidence of Animal Origin

There would indeed be evidence that man developed from animals if the most deeply buried remains were most like those of animals. But this is not what is found. Along with the peculiar types are found specimens of modern type, *buried just as deeply*. That this was true in South Africa is indicated by the following statement: "It seems likely, judging from the world as a whole, that more advanced men—what for the moment we will have to call 'true men'—were also in existence at the same time, overlapping the man-apes in the later part of the early Pleistocene."⁶

It is just as true that Wadjak man, a type resembling Australian man, was found in Java on the same level as *Pithecanthropus erectus*. But Wadjak man has received very little publicity because it was not what Dubois was looking for and did not fit into the theory of evolution. The discoverer, Eugene Dubois, locked up the two Wadjak skulls, took them home, and wrote nothing about them until after 20 years. Instead of conjecturing that modern man developed from *Pithecanthropus*, it is more scientific to think that Wadjak man was the ancestor and that the other was a mutant type headed toward extinction. This estimate agrees with modern genetics.

Likewise, modern-type skeletons were found among those of Peking man. The most sensational discovery of this kind was made at the Fontchevade cave in France, where a trained worker, Mlle. Germaine Henri-Martin, found skulls of modern type lower than the tools and weapons of Neanderthal man. There was no possibility that their position had been interchanged, for a floor of secondary limestone had formed between them.⁷ It was another example of a man like us who lived earlier than **peculiar** men.

Modern Man before "Primitive" Man

Much is being added to our knowledge of early man by a well-trained industrious worker, Louis S. B. Leakey, ably assisted by his wife, Mary. Born in Africa of missionary parents and educated in England, Dr. Leakey early made discoveries which indicated that some men of modern type lived earlier than certain "primitive" specimens. In 1932 the Leakeys discovered several skulls at Kanam and Kanjera in Kenya which were evidently of modern or *Homo sapiens* type, in the midst of Chellean and Acheulean cultures, which had been ascribed to less developed types of man.⁸

Leakey learned also to make stone tools and found that they and their makers are not to be despised. He took a stone knife which had lain in a cave since prehistoric times and with it skinned and cut up a Thompson's gazelle (which

is the size of a goat) in twenty minutes. Evidently the maker of this knife had skill.

In 1959 Dr. Leakey and his wife discovered what they called the world's earliest man and named it *Zinjanthropus boisei*.⁹ This discovery took place in Olduvai Gorge, 300 feet deep, in Tanganyika, East Africa. A reconstruction by Neave Parker, pictured in the *Illustrated London News*, shows a face which is human in every respect except that the forehead is very low. But since this skull was chiseled out of the rock in 400 pieces it is hard to be certain about the shape. The teeth, however, were well preserved and in their natural positions; they were without the long, interlocking canines which are characteristic of apes.

In reporting such discoveries, the age in years is usually mentioned very prominently. Based upon the remains of accompanying animals, Leakey estimated the age of *Zinjanthropus* as 600,000 years. But testing the bones by the potassium-argon method, the University of California scientists came up with the amazing age of 1,700,000 years.

Potassium 40 breaks down into calcium 40 and argon 40 at a rate which usually is steady; but in reality the usefulness of this test is based upon the assumption that environments have been uniform in the past, and that all contaminations have been removed. We know that any skeleton buried 300 feet deep in solid rock is old, but when one sets the age in years, someone else has a different estimate.

Since this notable discovery, specimens of another type, *Homo habilis*, have been found in the same gorge. This type is even more fully of modern type; and it was surrounded by many stone tools. The skull is larger than that of *Zinjanthropus*, the forehead is high, and the clavicle and the hand are those of modern man.

"Old" Man Resembles Modern Man

While dating in years is uncertain, as noted above, the skeleton of *Homo habilis* evidently is old as compared with others, and may be the oldest one ever found. While most skeletons were found near the surface, this one was 300 feet deep and in solid rock. The oldest man's resemblance to modern man is evidence for creation rather than gradual development.

As in other parts of the world, remains of giant animals are found in Olduvai Gorge: a sheep six feet tall, a pig as big as a rhinoceros, and a baboon bigger than a gorilla. These recall to one's mind the extinct giant bison and giant beaver of North America, which are hard to account for by evolutionary reasoning.

In evaluating the work of Louis Leakey we may say that to the extent that he has trusted *his*

own discoveries he has added much truth about man; but to the extent that he has agreed with fashionable theories he has become lost in the crowd.

Thus it is not the biblical account alone, but also the actual remains of man which indicate that the human race started as well-formed men. Of course such an origin had to be brought about by a personal Creator rather than by the laws of nature.

The above discoveries, with their interpretations by evolutionists, show that the workers had assumed already that which they were attempting to prove—namely, that man developed gradually from simple kinds of animals, by the process of natural selection. Considering this assumption as proved, then the skeletons which were most like the animals and least like modern man would be the oldest. But, as was pointed out above, this theory runs into difficulty because skeletons of modern type are found in positions just as low as the peculiar types.

The Bible agrees with these discoveries by recording that the trades developed early. In the fourth chapter of Genesis the following trades are mentioned: herdsman, farmer, builder of houses, tentmaker, musician, and blacksmith. It is the interpretation of the discoveries of science, rather than the actual discoveries, which disagrees with the Genesis account.

Compromise Theory Unsupported by Findings

There is a compromise theory to the effect that God allowed plants and animals to develop gradually by natural laws, and when animals had reached a high degree of development he took one of them and breathed into it a human soul. According to this theory it was *living dust* which received the divine breath.

While this is an evident attempt to harmonize science with Genesis, science offers no discovery to serve as a basis. Furthermore it is not so stated in the Hebrew text of Genesis. The statement is that “the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul [*nephesh chayyah* in Hebrew]” (Genesis 2:7). Let us quote from a Hebrew scholar at this point:

In Genesis 1:20 God said “Let the waters swarm with living (*nephesh chayyah*) swarms.” The American Standard Version substitutes “That hath life” for “living.” In 1:21 God created “great whales and every living creature

(every *nephesh chayyah*, every soul of life) that moveth.” In verses 24, 28 and 30 the words “living creatures” [and] “life” are all *nephesh chayyah*. That is to say, before the creation of man there were many things that had life, *nephesh chayyah*. It was *life* that came to the clay in Genesis 2:7 when God created man. It was not that a brute became man at that point.¹⁰

Those who agree with an evolutionary development of man overlook other passages in Genesis, namely, the creation of woman, the fall of man, and man’s creation in the image of God. It would be difficult indeed for the struggle for existence and natural selection to develop a creature like God, whose essence is love. Rather, such processes are fitted to develop weeds, bandits, and dictators.

Those who object to animal ancestry for man do not claim that animals are unclean or vicious, but that they are irresponsible. The laws of every government, however, as well as the laws of God, assume that man is responsible for his deeds. How impossible it would be to have a democracy with animals as citizens! If we value our freedom we must recognize our responsibility as men.

There is a chasm between man and beast which never has been bridged, this difference being observed in use of fire, use of speech, making tools, conscience, sense of responsibility, and belief in life after death. Anyone who seeks to erase these distinctions does not serve the best interests of the human race.

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MAN, THE UPRIGHT

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Man's vital organs are preeminently designed to facilitate his existence in the upright position. Because man's bipedal locomotion is unique, he is not a remodeled ape or monkey. A conjectural interpretation is offered that the quadruped position of lower animals and the crawling position of reptiles resulted from the Edenic curse. Man's unquenchable instinct to worship is discussed as the important spiritual counterpart to his upright position. Worship implies that physical act, which is unique in man, of bowing down from the upright position.

There are many differences between man and the brute creation. However, as Professor George Gaylord Simpson of Harvard University has pointed out, "the most crucial single anatomical point is the acquisition of upright posture and strictly bipedal locomotion."¹

Anatomically man's body is much like that of other mammals. The intestines in man are fastened by the mesentery to the posterior abdominal wall just as in the quadrupeds. This allows them to hang from above when the individual is on all fours; and this, no doubt, is the ideal arrangement for an animal which goes about in this position.

This fact, therefore, is regarded by some as evidence for evolution of man from the horizontal to the upright position. Similarly, attachment of the breasts in women, and the genitalia in men, might suggest that these organs as well were originally suspended from above instead of being attached to a perpendicular structure as in man.

But it should be remembered that in human beings the heart, which is the most vital organ in the body, is fixed to the upper part of the thorax so that it is suspended from above when one is standing or sitting. This is the ideal arrangement for *Homo sapiens*, as it enables the circulation to function most effectively when the individual is in the upright position. When lying down the heart is suspended in a horizontal manner but the demands on the circulation are minimized under such circumstances.

Upright Posture Very Important

In man, bronchi emerge from the lungs on either side and unite to form the trachea which lies in the mediastinum or central part of the thorax. This arrangement of the lungs on either side resembles somewhat the attachment of the handle to a pitcher when the pitcher is standing upright.

As a result the individual can breathe most easily in the upright position, and the lungs are

free to expand in all directions. When gasping for breath a patient nearly always tries to sit up. In quadrupeds, however, attachment of the lungs would be analagous to holding the pitcher in a horizontal position with the handle on the side.

Man's vital organs are preeminently designed to facilitate his existence in the upright position. Life in the horizontal plane would be intolerable for human beings. The popular idea that man was originally a quadruped is, therefore, based upon very superficial observation. From an architectural point of view the intestines in man could not possibly be suspended from above except by attachment to the diaphragm which would seriously interfere with the respiration.

It is important to remember that human babies are the most helpless of all off-spring among mammals. As such they require greater protection and care than any other newborn creature. The position of the breasts in women is ideal for the comfort of both the mother and the child when nursing. The newborn of other species usually stand on their feet when suckling which no newborn infant could possibly do. Moreover, the musculature underlying the breasts is ideally designed to support them in the upright position.

The coccyx, or lower end of the spine, corresponds to the tail in other mammals, but it is not a vestigial structure. It is turned inwards in order to provide attachment for the muscles which control the function of elimination. The coccyx also provides support for the pelvic viscera. Some additional support is essential in man on account of his vertical posture and this arrangement enables one to sit down without inconvenience.

Bipedal Locomotion Unique

Simpson rightly regards bipedal locomotion as man's second chief characteristic. Most mammals have four feet, but the quadrumana have four hands. This order includes the monkeys, apes and lemurs. Man is unique in having one pair of feet and one pair of hands which is, of course, exactly what a creature in the upright position would require. How, then, did it come about that, when hands and feet were "evolving" from fins, man was the only creature to develop one pair of each and not four of one kind or the other?

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All of these characteristics point unmistakably to the original creation of man as an upright animal. Man is not a remodeled ape or monkey. To suggest that the features which separate man from the lower forms could have come about by gradual evolution from one of the lower hominids may satisfy the minds of those who deny the existence of God. But for the believer it will be sufficient to exclaim with the Psalmist, "What is man, that Thou art mindful of him? and the son of man, that Thou visitest him?" (Ps. 8:4)

From the evolutionary point of view it is, of course, claimed that man did originally go on all fours until he learned to walk uprightly. It has been pointed out, however, by Sir Gavin de Beer, who was formerly Director of the British Museum of Natural History, that,

Whereas in animals other than man the axis of the head is rotated during later development so that the animal's head points in a direction which is a continuation of its backbone, in man the cranial flexure is retained so that his head points in a direction at right angles to the axis of his body. . . . Since the direction in which the man's head points, i.e., his line of sight, is horizontal, the position of the body will be vertical; and so man's erect attitude is associated with the retention during ontogeny of a condition which in other animals is embryonic and temporary, as it must have been in man's ancestors. . . . The erect posture in man is, in Bolk's view, a consequence of neotony of the shape of the head.²

In other words, this feature in man is due to the retention of a fetal characteristic throughout life, which in all other mammals, including the apes and monkeys, is only a temporary phase of prenatal life. It would be quite reasonable to assume that the ontogeny of man is, in fact, the normal development, and that, in all other mammals the change in axis which takes place during later development is a retrograde step. This change in axis occurs during intrauterine life and could not possibly be the result of acquired characteristics, or mutation. It is common to all mammals other than man.

When the judgment fell in Eden we are told that the serpent was "cursed above all cattle, and above every beast of the field." (Gen. 3:14) The Hebrew text would seem to imply that the curse fell upon all mammals, as represented by the cattle, and upon all reptiles, "the beasts of the field," but chiefly upon the snake. It might be suggested, therefore, that the quadruped position of lower mammals and the crawling position of reptiles is the result of that curse.

This would imply that in Eden all the animals, including the reptiles, must have originally been upright in position. This, of course, is conjecture

only and there is always danger in going beyond the limits of revealed truth. But such a concept of retrogression or devolution is at least as plausible as the reverse supposition of the upward and onward evolution of reptiles into mammals, and into man.

As a consequence of retaining the early prenatal axis of the head, the skull of *Homo sapiens* rests firmly on top of the spinal column instead of being suspended in front as it is in the quadrupeds. A few years ago, when "the world's most perfectly preserved specimen of a Neanderthal skull" was discovered at Monte Circeo in Italy, Professor Sergi³ demonstrated that even these early men must have "walked erect," just as we do today, "and not with an ape-like posture with the head thrust forward as previously believed." The skeletons of Neanderthal which had been discovered earlier were poorly preserved and this led to the supposition of an "ape-like posture" in these remains.

Man's line of vision in the upright position is at right angles to his body and this places him in a position of oversight, anterior and superior to all other creatures. When God created man in His own image He gave him "dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth." (Gen. 1:26)

Anatomically man retains the general bodily arrangement of the quadruped, but spiritually and positionally he has been placed above the rest of the animal kingdom to which he belongs. Men's upright position symbolizes his supreme authority over the brute creation. This position is lost in sleep, in all conditions where there is unconsciousness, and in death.

The Divine mandate given to man was that he should "Be fruitful, and multiply, and replenish (fill) the earth, and subdue it." (Gen. 1:28) *Homo sapiens* was ideally constructed to accomplish this purpose. This mandate has now been fulfilled for every part of the earth has been occupied and subjugated. It has taken man nearly 6000 years to fulfill the purpose for which he was designed.

Important Spiritual Counterpart

But man is much more than just an animal. Man's upright position has its spiritual counterpart in his unquenchable instinct to worship. As Dr. Arthur Pool has said, "No animal has ever yet shown any desire to worship whereas the most primitive man even in the most debased society always retains this fundamental urge and instinct."⁴ Here we have the negative and positive aspects of man's unique position from a spiritual point of view. "God hath made man

upright; but they have sought out many inventions" (Ecc. 7:29).

Living in innocence, man was upright physically and spiritually and he was in communion with God. But "many inventions" of the mind, that is to say, the evil imaginations of his heart, have separated man from God.

Nevertheless, in spite of his "total depravity" man, the upright, still retains his instinctual desire to worship. "The heathen in his blindness bows down to wood and stone," knowing not the invisible God Who is revealed to us in Jesus Christ. But for them, as for us, there is no excuse as we all have the revelation which God has given to us in His creation. (Rom. 1:18-32) "Therefore thou art inexcusable, O man." (Rom. 2:1)

The instinct to worship on the part of man implies first of all the ability to communicate with others, and man alone has the supreme gift of speech which enables him to communicate abstract ideas to his fellow men and to have fellowship with God. As Dr. Gertrude Himmelfarb has pointed out, in the orangutan "the tongue and all the organs of voice are exactly the same as in man and yet this animal does not speak."⁵

Perhaps the loss of speech in the lower animals may have been part and parcel of the curse. At any rate we know that the serpent spoke to Eve in the Garden of Eden (Gen. 3:4) and this faculty was restored to Balaam's ass (Numbers 22:28-30) by Divine authority. The serpent and the ass are representative of the reptiles and the mammals referred to in Gen. 3:14.

Only Man Can Worship

The instinct to worship on the part of man also implies the physical act of bowing down. There are several words in Hebrew which mean "to worship" and the majority of them also mean to prostrate oneself or bow down. And that is the essential physical element in the ascription of honour and reverence to God, or man, or to any material object.

We, as believers, worship the invisible God (Col. 1:15) Who is unseen (1 Peter 1:8) and we are forbidden to bow down to or worship any material object. "Thou shalt not make unto thee any graven image. . . . Thou shalt not bow down thyself to them, nor serve them." (Ex. 20:4) To bow one's head to a material object is, therefore, an act of idolatry.

We are not, of course, forbidden to bow down to those in authority or to women as an act of

courtesy. This commandment in the law is restated in the New Testament (1 John 5:21 and 1 Cor. 10:14) so that it is equally wrong today to bow down to a material object or to worship the same.

In order to bow down, however, one must be in the upright position and, as we have seen, this posture characterizes man's unique position anatomically. Man is the only animal with the instinct to worship and, in a physical sense, he is the only one who is capable of bowing down. Although some other animals, such as monkeys, apes, chipmunks, bears, etc., are able to stand or walk erect on their hind legs their normal position is on all fours with the head pointing forward, in which position it would be difficult to recognize bowing down as such.

When the curse fell upon the serpent God said, "Upon thy belly shalt thou go" (Gen. 3:14). In this position, of course, worship in the physical sense of bowing down would be even more impossible. It is, therefore, the lowest position in the zoological scale from a spiritual as well as from a physical point of view.

George Gaylord Simpson has said that man "is the only ethical animal."⁶ And how true it is that man alone experiences a feeling of guilt when he sins, and man alone is conscious of the judgment to come, for man alone enjoys the hope of immortality beyond the grave. These characteristics are part and parcel of our Divinely appointed heritage, for man is unique in his origin and destiny. How true it is, however, that even today man still prefers to worship the creature rather than "the Creator, Who is blessed forever" (Rom. 1:25).

"O come, let us worship and bow down; let us kneel before the Lord our Maker" (Ps. 95:6).

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BLOOD REALLY COUNTS

EVAN V. SHUTE*

Blood groups are a basic variable element in mankind, and they are of immense practical importance. Basic similarities and differences of man and other anthropoid forms are reviewed on the basis of recent intensive studies of human and other primate blood groups. Analyses of other blood proteins, such as hemoglobin, transferrins, and myoglobin are used to compare man and other living forms. Due to advances in biochemistry and electron microscopy, phylogenetic problems become more and more puzzling, and more difficult to subsume under one theory. Evolutionists no longer can use casual half-facts and crude homologies.

Introduction

Men differ in skin color, and accordingly we say that they are born of different races. They differ in their place of birth, and we describe them as being of several nationalities. But far more fundamental in any classification of men is the difference in their blood groups, a difference which sometimes makes their bloods incompatible for transfusion. When incompatible, the recipient's blood serum clumps (agglutinates) the donor's red blood cells. Such a phenomenon is very serious and can even cause death. It appears to represent a basic variable element in mankind.

This variation is due to antigens in the red blood cells and antibodies in the plasma, and their reaction to one another. Indeed, it is possible to classify human beings into four main types or blood groups by means of the agglutination (clumping) of the red cells. These groups are AB, A, B, and O. The red blood cells may behave as if they carried antigen A, or antigen B, or both A and B, or neither (the last being "group O").

There are other factors independent of the A or B antigen. One of these, for example, is the Rh factor. We say that a person is Rh positive, if his red blood cells are agglutinated by the plasma of a Rhesus monkey. About 15 per cent of the human population do not show such agglutination, and therefore are called Rh negative persons. There are also minor antigens such as M and N, even S and P, but none of these seem to have much clinical importance.

As an example of the importance of the blood groups, we might say a word about Rh negative women. Many of these marry Rh positive men. The child of such a woman is apt to develop *Erythroblastosis fetalis*, which can be a fatal condition. However, the condition can occur only

when the baby she carries has its father's Rh group. Then the mother reacts to this by developing Rh antibodies in her plasma, *when and if* the child's Rh antigens leak into her blood stream through the placenta. If so, then her own antibodies pass back into the fetal blood, agglutinating the positive red blood cells of that fetus. These red blood cells are damaged accordingly and a severe anaemia of the fetus can develop, even deposit of pigment in its brain (kernicterus).

Since the blood groups were discovered by Landsteiner in 1902, and since Nuttall in 1904 drew up a table to illustrate, amongst other things, some similarity of primate blood types, much has been made of such similarity by evolutionists. Add to this the physical resemblance among primates and one runs into a *prima facie* case for "human evolution" that has long seemed incontestable to many casual students.

Evolutionists have presented *the superb* biochemical argument-similar tissues. He "hath made of one blood all nations of men (and apes, say evolutionists) for to dwell on all the face of the earth." Our features may be different, our foreheads higher, and our chins more prominent than those of our primate cousins, but our veins give the misalliance away, and our origins are written there in red for all to see.

Dewar¹ early pointed out some odd things about Nuttall's table that evolutionists should find disconcerting-but few have seen his criticism. Dewar noted, for example, that some primate bloods were "closer" to that of man than the similarity of some races of men. Thus all anthropoids, but only 71 per cent of human beings, showed a full reaction to the precipitins of anti-human serum. Indeed, by these tests some human beings are as nearly related to carnivores, rodents and ungulates as to their own kind.²

Recently, there have been many more intensive studies of human and other primate blood groups than Nuttall's study. I will now discuss some interesting results.

Blood Groups in Apes and Man

In the usual serological tests chimpanzees, gibbons and orangutans have natural iso-agglutinins defining different blood groups indistin-

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guishable from the human A, B and O groups. In 189 chimpanzees tested, 14.3 per cent were group O and 85.7 per cent group A. In gibbons and orangutans groups A, B, and AB, but no group O were found. Nine lowland gorillas had B-like factors only, but two mountain gorillas had group A.³

As far as the important A, B, O, groups are concerned, gorillas are more like monkeys than man. Of 40 chimpanzees tested none had group B, but all had antigen A similar to human antigen A₁. One animal had an antigen resembling A₂; 10 animals tested had the Rh antigen, O and c. All had M antigen.^{4,5}

In the A B O blood groups, chimpanzees are most like man, and gorillas are the most different (more like Catarrhines, the Old World monkeys). In the Catarrhini A B O types vary from species to species—thus, for example, only B is found in Rhesus monkeys. The serology of A B O in chimpanzee, orangutan and gibbon is more like man than the serology of their M N types. In Rh-Hr systems, resemblance to man from greatest to least is in this order: chimpanzee, gibbon, gorilla and orangutan. But the Xg^a antigen in gibbons is possibly sex-linked as in man—and is not found in chimpanzee, orangutan, baboon, drill and Rhesus at all!⁶

Miscellaneous Blood Groups in Bacteria, Chickens, and Plants

Bacteria, such as *Escherichia* and *Klebsiella*, have blood substances probably identical to those found in man: AB and H(O). Macromolecular substances closely similar to the human blood group H(O) substances are obtainable from plants, too, especially from the Japanese Yew and *Sassafras*.⁷ The evolutionary resemblance is obvious here, of course!!

Chickens have serological factors similar to human blood group A. Blood group A antigens occur in leghorn embryos and in partially purified egg-grown influenza virus preparations. Actually it has not been proven to occur in the virus. However, group A activity was found in commercial influenza virus vaccines, and injecting this material into human beings increased anti-human blood group A₁ and A₂ antibodies.⁸

Specific seed haemagglutinins are almost invariably found in the Leguminosae (the legume vegetables), notably in Viciae (broadbeans), Phaseoleae (kidney beans), and Genisteae (brooms).⁹

Blood Proteins

Blood proteins of the gibbon and orangutan are more different from those of man than those of the gorilla and chimpanzee, as is true for serum albumins, transferrins and ceruloplasmins. Primary structures of the hemoglobins

are similar, but the orangutan gives slightly different polypeptide patterns. Gibbon and human hemoglobin are very similar, with a difference in only one tryptic peptide of the beta chain.

The ceboid monkey, *Aotes trivergatus*, shows an unexpected similarity to human serum albumin; yet the two lemur families (Lemur and Propithecus) show considerable differences. High correspondence of the tree shrew to human serum albumin supports the idea that the former is a true primate.¹⁰

Results from two dimensional starch-gel electrophoresis do not support putting chimpanzees and gorillas in the same genus. But by this standard, man is closer to the gorilla and chimpanzee than to the gibbon and orangutan. Other protein analyses are as follows:

With chicken antisera
to human ceruloplasmin, and
With chicken and rabbit antisera
to human transferrin:
gorilla and chimpanzee are the same as
man.
* * *

With Rhesus monkey antisera
to human albumin:
gorilla and man close
but chimpanzee farther away.
* * *

With Capuchin monkey antisera
to human serum:
gorilla closest, then
chimpanzee farther away.
* * *

With rabbit antiserum
to human alpha₂ macroglobulin:
gorilla same as man.
* * *

With chicken and rabbit antiserum
to human gamma globulin:
only chimpanzee like man.

Orangutan and gibbon diverged most on all the tests.

All apes and man are nearly identical on immunodiffusion plates with chicken anti-human albumin sera. But gamma globulin revealed distinct differences among the hominoids. (N.B. Chicken anti-human albumin sera developed larger cross-reactions with the albumin of the tree shrew than with albumins of the elephant, beef, rat, dog, rabbit, horse, tenrec and kangaroo. Next closest was the elephant!¹¹)

Alpha and Beta Chains of Hemoglobin

Hemoglobin A is the pigment of adult human blood cells. There are different types of hemoglobin in the fetus and the adult, in sickle cell anemia and in health. Indeed, many hemo-

globin types are known. Identity depends on amino acid sequences in the globin part of the molecule. A difference in one amino acid, amongst 300 others that are identical, determines whether a hemoglobin is type A, S or C, for example.

Characteristic arrangements of amino acids make up proteins. Each half molecule of adult hemoglobin A contains one alpha and one beta chain of polypeptides. Fetal hemoglobin (F) consists of an alpha and a gamma chain. Many variations in the presence or absence of chains create many different hemoglobin types. Chains can be distinguished by their terminal amino acids.

Differences between alpha and beta amino acid sequences in the hemoglobin of animals are very numerous. Indeed, alpha sequences of mice and men, and their beta sequences also, are more alike than the alpha and beta sequences of hemoglobin of either mice or men! The amino acid sequences of the protein myoglobin in whales are like the sequences of hemoglobin in man!¹²

Hemoglobin of gorillas and man differ by only one amino acid residue, but each is still distinct, and any idea of a phylogenetic distance between them is a "concept that is confusingly applied." Again, the hemoglobin peptide pattern of the baboon, *Papio*, is as different from human hemoglobin as that of some prosimians! The hemoglobin of Ceboidea (South American monkeys) rather closely resemble human peptide patterns in starch gels, but these South American monkeys are "not closely related to man." However, many pongid (ape) hemoglobins could be mistaken for that from human beings. We must be careful not to tamper with the classifications on the basis of a single trait, such as hemoglobin—for primate hemoglobin molecules are hard to interpret on the basis of evolutionary theory. Therefore, say evolutionists, "They are not crucial."¹³

Gamma Chains of Hemoglobin

Gamma chains are found in fetal human hemoglobin—and (gamma-like) beta chains in lemurs. Is this recapitulation or convergence? "More data are needed." Till then: "It will be difficult to assess how easily the molecular and nonmolecular approaches can be synthesized into a complete picture of evolution."¹⁴ The evolutionist is really asking here for "time out" till he feels able to continue the game.

But Pauling¹⁵ points to similarities in hemoglobins of evolutionary "near-relations"—and vice versa. He estimates that horse hemoglobin and human hemoglobin differ by 18 amino acid substitutions, as do their beta chains—each chain showing an effective mutation every 14.5 million years. But gorilla chains differ from ours only in

one or two amino acids. Hence Pauling computes about 11,000,000 years since apes and man had a common ancestor!

The human fetus has an abnormal beta chain in hemoglobin F called a gamma chain. It has 36 amino acid differences; therefore, the fetus and man separated 260,000,000 years ago, at the beginning of the Carboniferous! But, according to evolutionists there were no human beings then! Believe it or not, in regard to hemoglobin, a human fetus is closer to a fetal horse than to a human adult, Pauling concludes!! Here is an evolutionist surely at the end of his very considerable wits!

Zuckerkandl¹⁶ argues that, as far as hemoglobin is concerned, a gorilla is merely an abnormal human and vice versa. G. G. Simpson¹⁷ says this consideration merely means that hemoglobin is a bad choice as a criterion; it "has nothing to tell us about affinities, or indeed tells us a lie." One or many molecules could be misleading here. No one kind of evidence on evolution is sufficient, concludes Simpson. Convergence is the real problem according to Simpson.

Cohen¹⁸ points out that the homoproteins classed as hemoglobins have an apparently random distribution in such lower forms as protozoa and fungi—and evolutionary significance here becomes "quite mysterious." Be it noted that some cold water fish have neither erythrocytes nor hemoglobin!

It is not enough for vertebrates to make hemoglobin. It must be converted to ferrous iron, absorbed, transported by a special transferrin, stored, and consumed with a special ferritin. Are such proteins to be found in "lower forms"? Probably not.

Transferrins

That study of electrophoresis of serum transferrins in primates is not helpful to decide any evolutionary relationship is conceded by recent authors.¹⁹ Thus electrophoresis shows serum transferrin bands in chimpanzees similar to no primates tested, but to the tree shrew, *Tupaia glis*! All other primates tested, except man, showed iron-binding bands of the beta globulins two or three times as mobile as that of chimpanzees.²⁰

Phylogeny of Primate Myoglobin

The same myoglobin-peptide patterns exist in Hominoidea, Cercopithecoidea (old world monkeys), and Ceboidea (new world monkeys), but all differ from each other. This is more distinctive than serum albumin or hemoglobin comparisons.²¹

Heteroagglutinin of Horseshoe Crab

Serum of *Limulus polyphemus* agglutinated red blood cells of other species, notably those of

the human and sheep, but not the goat or alligator. Ox cells were strongly clumped by one *Limulus* serum tested. Cells of *Testudo hermanni*, a turtle, are also agglutinated thus, it is reported.²²

General Discussion

As men, we care about interrelations of the primates. Is man really first in peace, first in war, and first in the hearts of the globulins?

Much depends on our criteria. If we select heteroagglutinins of the horseshoe crab, then we respond like sheep. We share our blood substances with the colon bacillus and sassafras, certainly sharing type A with chickens. Even leguminous seeds have hemagglutinins. Human serum albumin is very much like a certain ceboid monkey and the tree shrew—even somewhat like that of the elephant.

A B O blood groups put gorillas further from man and closest to monkeys. Of all the great apes, orangutans are closer to man than chimpanzees with respect to the M and N factors. The Xg^a antigen in gibbons is sex-linked, as in man, and is not found in most other primates at all. We must decide if A B O matter more than M and N and Xg^a. Do they? The inferences change tremendously as we decide.

Implications of hemoglobin studies are ambiguous, perhaps relating adult men to Ceboid monkeys, but human fetuses to horses and lemurs! Indeed they could relate us to protozoa and fungi and mice! And myoglobins can relate us to whales. Transferrins do not help in our quandary, really, showing only the closeness of chimpanzees to tree shrews.

Evolutionists have always thrived on casual half-facts and crude homologies. Now that biology is growing up and enlisting the help of biochemistry, electron microscopy, and other such approaches, phylogenetic problems become more and more puzzling, and more difficult to subsume under one theory.

If one knows enough and reads enough, he has real trouble in accepting many of the old arguments of evolutionists. The very data the latter hoped for and sought to clinch their argument now give them the greatest trouble. But then facts are “awkward chieftains and winna ding and darena’ be disputed.”

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UNIVERSITIES AND COLLEGES HAVING THE CREATION POINT OF VIEW

WALTER E. LAMMERTS*

The King's College was founded in 1938 as an outgrowth of The Young People's Association for the Propagation of the Gospel, led by the late Percy B. Crawford, D.D. It is located in suburban New York City about 30 miles from the heart of this metropolis, which is a cultural, historic, and scientific center of the world.

The 70-acre campus contains the pinnacle of the beautiful village of Briarcliff Manor, and overlooks the historic and scenic Hudson River. Public and private transportation are within easy reach of the college grounds.

The coeducational student body presently numbers 680. Cost of tuition, room, board, and fees is about \$1900 for an entire college year. This cost appears modest when one considers prices charged by other institutions of higher learning in New York City and its suburban areas.

For capable and needy students a variety of scholarships and loans are obtainable, and extra help is available to those from ministerial and missionary families. Also many students avail themselves of various opportunities to accept employment at the college or in the surrounding community.

All phases of the program at The King's College are designed to fulfill general purposes which are:

To offer an education in the liberal arts and sciences, including the humanities, the social sciences, and the natural sciences.

To encourage an understanding of the basic teachings of the Christian faith with its values and standards, and its relationship to all areas of knowledge.

To challenge students to dedicate their lives to the service of the Lord Jesus Christ, and of their fellow man.

To lay a sound foundation for graduate study and professional careers.

Included in the college's interdenominational doctrinal statement are belief in the inspiration of Old and New Testaments and such doctrines as creation, man's fall into sin, Christ's substitutionary death, the triune Godhead, and resurrec-

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Figure 1. Front View of Main Building.

tion of the just and the unjust. The college is interested in training students who believe its doctrinal statement. Undergraduate majors are offered in 13 fields, but all students take a minimum of 16 hours (about 12% of the total college load) in Bible courses.

In the Division of Natural Science a student may major in biology, chemistry, or mathematics. The division is chaired by Carl Gustafson, Ph.D. who also is Professor of Chemistry and chairman of that department. Harold Heie, Ph.D. heads the mathematics department. Presently there are a total of 8 full-time instructors in the division; and the college is looking for additional faculty members who are enthusiastic about participating in The King's College program.

A theme in all science courses is that nature is to be viewed as the result of God's creative workmanship. Creative design and purpose are stressed wherever appropriate.

Presently, a student majoring in biological science takes a minimum of 44 semester hours in science with somewhat over half of these hours being in biology. The four members of the Biology Department are Wayne Frair, Ph.D., Allan Bleecker, Ph.D., John Turner, M.A., and Donald Abb, M.S. All subscribe to the statement of belief of the Creation Research Society, and they are anxious to advance the creation cause in the classroom and in their research. Research areas of these men, respectively, are biochemical taxonomy; aquatic biology; genetics; ecology and ornithology.



Figure 2. Biology Laboratory.

Biology majors are given opportunity to do at least one semester of independent research before graduation. Many of these research projects have dealt with the creation theme, and one of

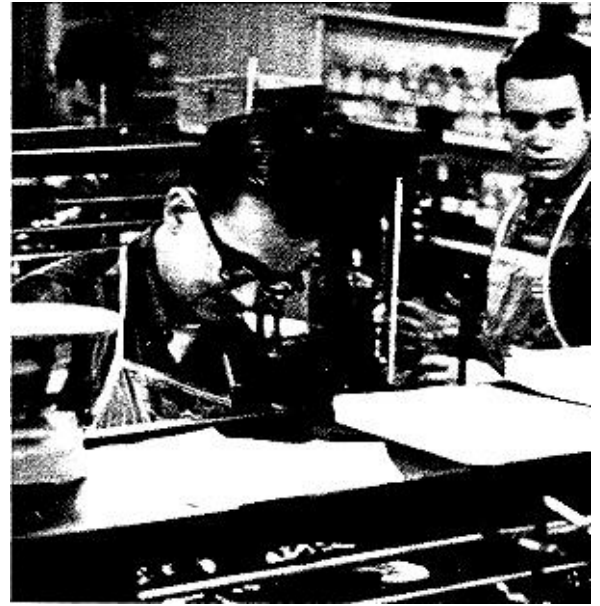


Figure 3. Chemistry Laboratory.

these student projects, which utilized DNA, was mentioned in the *Creation Research Society Annual*, 1967, page 22.

ARTICLE REVIEW

HAROLD ARMSTRONG *

"Heresy in the halls of biology: mathematicians question Darwinism" by Robert Bernhard (Assistant Editor). *Scientific Research* (Published by McGraw-Hill, Inc.), Vol. 2, No. 11, November, 1967, pp. 59-61, 63, 65 and 66.

(Editor's Note-Full texts of claims made by mathematicians and responses by biologists, who are mentioned in this Article Review, may be found in the report, "Mathematical Challenges to the Neo-Darwinian Interpretation of Evolution," Edited by Paul S. Moorhead and Martin M. Kaplan. Wistar Institute Symposium Monograph Number 5. The Wistar Institute Press, Philadelphia, Pa. June, 1967.)

* * *

It is fairly commonly acknowledged among evolutionists that the evidence on which Darwin based his theory was inconclusive, and, indeed, that it remains inconclusive to this day (at least, in the sense that the conclusion which they want is not logically necessary). Some of the apologies for evolution, in fact, remind one of Tertullian's remark: "I believe it because it is impossible."

Now it has happened before, in the history of thought, that people have continued for years, even for generations, believing something on inadequate evidence, until someone started to ask questions and was able to get a hearing. Clearly it is well that any merely human theory be re-examined occasionally, for we know that "jumping onto the band wagon" happens in scientific theorizing as well as in political action. (It is interesting to note that H. Dingle has recently questioned certain aspects of Einstein's special theory of relativity.)

Such a reexamination of Darwinism was reported at some length recently in the special journal, *Scientific Research*, published by McGraw-Hill, Inc. The questioning has been heard for two or three years, and involves raising

... philosophical and methodological objections to evolutionary theory... it is said that even Darwin himself remained troubled by the same questions currently preoccupying more and more biologists: can the complexity and diversity of life be understood simply as the result of random variations which are selected according to the criteria of "survival of the fittest" (Darwinism) —or "survival of

those who leave the most offspring" (neo-Darwinism)?¹

The questioning of interest in this article was carried out by mathematicians including M. Eden (M. I. T., he is concerned also with electrical engineering), S. M. Ulam (Los Alamos), V. Weisskopf (M.I.T.), and M. P. Schutzenberger (University of Paris).

Specific Questions Are Raised

Some questions are:

has there been enough time for natural selection, as it is seen through the eyepieces of Darwinism or neo-Darwinism, to operate and give rise to the observed phenomena of nature? No, say these mathematicians. Is it likely that the superbly ordered biochemistry which we see now could have evolved through random experiments which repeatedly tested the organism against the environment? Again, no. The probability that we are here now, if natural selection had to choose from a blindingly large number of alternative systems by means of the mechanisms described in current evolutionary theory, is virtually zero.²

Eden, according to Bernhard, has sharply criticized the recent way in which "fitness" has been redefined, and disagrees with neo-Darwinism, referred to above, because it leaves out of consideration an organism's specific way of life and looks at population changes in respect to leaving offspring and not in respect to anything else.

As geneticist C. H. Waddington (University of Edinburgh) puts it:

It is smuggled in and everybody has in the back of his mind that the animals that leave the largest number of offspring are going to be the best adapted also for eating peculiar vegetation, or something of this sort—but this is not explicit in the theory. All that is explicit in the theory is that they will leave more offspring.³

The author points out that Eden believes such a conceptual scheme is vacuous, and "as others have complained, is incapable of disproof. He does not deny the usefulness of evolutionary concepts—but, in contrast with theories of physics, there is no crucial experiment which one could propose to show whether the theory is false or not."⁴

Three Comments Stated

Some comments might be in order here. First, "survival of those who leave the most offspring," would seem to be useless, for nothing is said as to why those are any different from the average.

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For instance, consider Darwin's explanation of the long neck of giraffes. Why should we suppose that those with longer necks would leave more offspring, unless they were "fitter" in some way?

Indeed, that argument is an example of the old fallacy of "only two terms," which gives no conclusion. Darwin at least had three terms: "fitter," "more offspring," "survival," from which a syllogism can be made. The only trouble was that some of his premises were false.

For a second comment, we deny that evolutionary concepts are useful. A false theory, in itself, cannot be useful, any more than one can know something which is not true. Is not the case like that of a man who maintains that the moon is made of green cheese, but who can tell the time at night by it? His use of the moon has nothing to do with his peculiar theory.

And as a third comment, it might be remarked that there are really no crucial experiments in physics. Foucault, for instance, was supposed to have established that light was a wave phenomenon, but it was not long before particles, in the form of photons, had returned through the back door.

Any alleged crucial experiment must proceed by "affirming the consequent." It must argue: "If A is true, then B happens. But B has happened. Therefore A is true." But, of course, such an argument is fallacious, and it is easy to construct absurd examples.

Still, it is possible in physics to do experiments which are to the point; the situation with evolution would correspond a little bit with that of a physicist who erected elaborate theories of atomic structure on the basis of a few experiments on large objects falling due to gravity.

Example of Logical Fallacy

An illustration of the fallacy of affirming the consequent, and

. . . an example of how this theory can, by its loose logical structure, explain *anything*, is provided by J. C. Fentress of the University of Rochester's Brain Research Center. While in Cambridge, studying the habits of the British vole—a type of field mouse—he found that one species (living in woods—H.A.) would freeze when it observed a test object moving overhead, while the other species (living in fields—H.A.) would run. . . . Fentress took these data to some zoologist friends, but he reversed the observations and asked them why—when the converse was actually true—the woodland species ran away and the field species froze. These zoologists were able to give very elaborate and satisfying explanations

for this false data by using conventional ideas about selection theory.⁵

Bernhard explains that Eden pointed out also, . . . clearly . . . life has developed to this state in a relatively small number of generations. But without some constraint on the notion of random variation in the properties of the organism, there is no particular reason to suspect that we could have gotten any other viable form than nonsense. So something is missing in our conception of natural selection. Since we do exist, there is some path by which we have arrived in this very small corner of a tremendous space of possibilities in only a small number of generations. What, he asks, is the character of the constraint that makes this possible? Because it is mute in the face of this question, Eden claims, current theory is inadequate.⁶

It is not very clear what is understood by "a small number" of generations. We should say: "at most a few hundred," though perhaps few people would agree with us. But the point seems to be that the variations, which would come from just jumbling the plans, have not happened in point of fact. If various kinds of creatures have developed at all, the process was directed and guided somehow.

Structure, Relation of Proteins

Some rather involved arguments about the structure of proteins, in terms of polypeptides, are treated by Bernhard. By considering combinations, the number of theoretically possible proteins is estimated at about 10^{325} . There is evidence, though, that useful (to living beings) proteins are very uncommon in terms of mere combinations and probabilities. An argument to this effect involves the two chains, alpha and beta, of human hemoglobin A. The chains, it is said, when arranged for optimal similarity of composition and structure, agree in 61 places, disagree in 76, and there are nine gaps.

It might be proposed that one of the chains was derived from the other, and that the derivation came about somehow from mutations in the nucleotide sequence in DNA. Of the 76 places at which the chains differ, 42 of the places would require the mutation of one nucleotide in DNA, 33 require two changes, and one requires three changes. These, along with the nine gaps, make up 120 "point mutations" required to pass from an alpha to a beta chain.

On the other hand, when distribution of amino acids along the chains is investigated, it is found that there is a mean difference of only about one and one-half per amino acid type. This, Eden maintains, would be unbelievable if the one chain had changed into the other by a random

process in only 120 attempts. That there must have been something guiding the process seems clear to the Creationist—if it happened at all.

The belief “. . . that processes of low probability have led, every 10,000 or 1,000,000 years, to the establishment of stable species populations,” has no independent evidence, it is urged by Eden. There are no natural processes of such a low probability and requiring such a length of time to stabilize themselves—at least, none that is to the point. And if there be any—e.g., in geology or cosmology—they are not based simply on random events.

“From a strictly thermodynamic standpoint,” the argument points out, “the kinetics and equilibria of biochemical systems are characterized by two extraordinary features: a high probability for the existing, biologically functional forms, and a very rapid time course.”⁷ The genetic system is not simply a blueprint—a carefully worded recipe for producing an organism—but rather an algorithm, a minimal generative procedure.

It is proposed that, if the genetic system is an algorithm, the “language in which it is written” is yet to be discovered. Eden’s suggestion is that molecular biology has given us the alphabet, but an alphabet, by itself, tells us little about the language.

Of course, connection between alphabet and language ultimately exists only in our minds. And if the analogy of language and alphabet means anything, it is impossible that the language would be altered by random changes in the symbols, and still make sense. The process must be directed somehow is the opinion of this reviewer.

Conclusions

Considerations in this article, and others like them, could be quite useful. But, perhaps, a few criticisms and comments might be offered in conclusion:

Firstly, there has been no real attempt at an explanation of how a certain sequence in a protein chain can bring about the design of say a peacock’s tail. To say “with enzymes, somehow,” is to imitate the dear old lady who thought that machinery worked “with screws, somehow.” But it is the peacock’s tail which evolutionists must explain; in working so hard at the proteins, they may be labouring at the wrong problem.

Secondly, we might ask the evolutionist whether he believes in free will—in the philosophical sense. If he say “yes,” then he is admitting that something is neither mechanically determined nor comes about at random. Then, why not the development of creatures? If he says “no,” then he cannot will to consider the matter rationally, and any consideration at all is futile.

Thirdly, it is really not reasonable to consider the matter apart from the whole question of the origin of life. Was the lowly amoeba (or whatever is supposed to have come first) created directly, (as Darwin seems to have suggested, whether or not he really believed it)? If so, why not apply Ockham’s razor, and admit that the other **kinds**, too, were directly created? If not, then there is really no difference between living and dead things.

But the arguments that we have been considering show that there is a difference. Moreover, any unprejudiced man would grant that there is a difference—an enormous one. Thus the evolutionist must fall either on the one hand into a proliferation of hypotheses, or, on the other hand, into paradox.

The arguments reviewed are intended, supposedly, not so much to support creation (although they actually point in that direction), as to improve and bolster the theory of evolution. If so, it is work expended on an undeserving cause. For, besides the fact that it happens to be untrue, there is one radical fault in the evolutionary position. Let Jeremiah tell us what that is: “. . . they have forsaken me, the fountain of living” waters, and hewed them out cisterns, broken cisterns, that can hold no water.”⁸

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- ³*Ibid.*, p. 60.
- ⁴*Loc. cit.*
- ⁵*Loc. cit.*
- ⁶*Loc. cit.*
- ⁷*Ibid.*, p. 65.
- ⁸Jeremiah 2:13.

COMMENTS ON SCIENTIFIC NEWS AND VIEWS

HAROLD ARMSTRONG*

It seems reasonable to suppose that mountain ranges arose at the end of the Flood, and that the water was concentrated into oceans. This viewpoint is set forth at greater length in such books as *The Genesis Flood*. An article by R. L. Grasty¹ may have a bearing on this matter. The point expressed was that when mountains rise, the oceans regress.

A rather clever illustration of this represents the continents by blocks of lead floating in mercury. The mercury is supposed to represent the fluid (or semi-fluid) layer under the Earth's crust as we know it. Water, on top of the mercury, represents the ocean. If the blocks of land are turned on edge (this represents the rising of the mountains), the distribution of the water changes.

In particular, if some of the blocks, which were just covered with water, are left flat, while others are turned on edge, the blocks which were left flat are uncovered. Of course, such an illustration does not prove that things happened in that way, but it might be useful in the course of a lecture.

It is proposed, moreover, that epicontinental seas have, in fact, regressed, by about 600 feet, since the Cretaceous period. A graph shows how the area of epicontinental sea seems to have decreased with time, and this graph looks oddly like the one given a while ago in this publication, showing how *lifetimes* decreased since the Flood.

Perhaps it is worth noticing also that the beginning of the decrease of the seas—call it the Cretaceous period or what you will—is just about the time at which the dinosaurs and such creatures disappeared. If we ascribe their extermination to the Flood, and the decrease of the epicontinental seas to the drying up of the Flood, the two things fit together very well. The only difference is that we put it a few thousand years ago, instead of many millions.

"Two Revelations" Like Old Ideas

We often hear statements nowadays that there are "two revelations": that of Scripture and that of science. Moreover, it is said that the story of Creation, e.g., while false scientifically, is of value theologically. Let us look into these notions a little more closely.

If the story of Creation is of value, it must be true in some sense; an utterly false thing is worthless. A work of fiction, e.g., is worthwhile only in so far as it is "true" to human nature, to experience, etc. Thus if the story of Creation is of value theologically, it must be true theologically.

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So what is being maintained is that the story of Creation is true theologically, but false scientifically.

Now it is of interest to notice that such a doctrine of "two truths" is nothing new. It is, in fact, at least seven or eight hundred years old, having been one of the doctrines of the Averroists, against whom St. Thomas Aquinas, in particular contended so strongly.

The Averroist doctrines seem strangely familiar; they included: (1) monopsychism, the "soul-of-the-hive" notion (compare "humanity knows," "science says," etc.); (2) denial of personal immortality; (3) denial of divine Providence in the government of men and things . . . ; (4) the doctrine that the physical world is necessary and co-eternal with God . . . ; (5) determinism, and denial of moral responsibility . . . ; (6) the theory of "two truths", that what is true in philosophy may be false in theology, and vice versa.

Do not these doctrines sound strangely familiar? Yet they were not really original in the thirteenth century, being really based on an Arabian philosopher's misunderstanding of Aristotle. Truly, there are other places besides the market where we may find stale goods concealed by fancy wrappings!

Artificial Selection Is Not Natural Selection

Recently I came across the book, *On the Realisation of the Possible* by F. W. Bain.² Likely it is out of print now; even the publishers may no longer be in business; yet there are some things in it worth noticing.

First of all, the title contains words used in a technical sense. "Possible" means "potential" in Aristotle's sense—the sense in which an acorn is potentially a tree; and "realisation" means the development of the potentiality; in the case of the acorn, e.g., germination and growth. The book attacks the excessively mechanistic and mathematical theories of nature, and also the "all-in-the-mind sort, as, e.g., Berkeley's is commonly understood.

What concerns us especially, though, is the attack on Darwinian notions, which, in their original form, must then have been in their heyday. Let me quote:

It is precisely in connection with the cell as the potentiality of the fully developed animal (how modern—DNA was not known then, of course—H.A.) that the impotence and superficiality of Darwin's theory . . . becomes so glaring . . . it is at once a truism and an absurdity, the absurdity being quietly swallowed for the sake of the truism . . . the continued production of similar forms is not an accident . . . (so) . . . the origin of species . . . is cer-

tainly not explained by accidental variation . . . the insignificant variation in the full grown animal . . . could never exercise the slightest influence. . . Darwin was a very great naturalist. . . but he was a very poor thinker, and the only part of the Origin of Species which is original is altogether futile.³

Is it possible for Nature to select those variations which are selected by man? Certainly not . . . they are so slight as to be all but imperceptible, and consequently of no value whatever to the organism. Still less possible is their accumulation in any one direction, seeing that intercrossing would instantly destroy them.⁴

Is this not a good point? In "artificial selection" we may not see much advantage in the first generation, but we go on in hope that there will be some eventually. But is it not a little too much to expect "Nature" to act thus?

Our Powers Not God's Powers

Asked how a man might convince himself that every single act of his was under the eye of God, Epictetus answered:

Do you not hold that all things are bound together in one?

I do.

Well, and do you not hold that things on earth and things in heaven are continuous and in unison with each other?

'I do,' was the reply.

Else how should the trees so regularly, as though by God's command at His bidding flower; at His bidding send forth shoots, bear fruit and ripen it . . . if then all things that grow, nay our own bodies are thus bound up with the whole, is not this still truer of our souls? And if our souls are bound up and in contact with God . . . shall He not feel every movement of theirs as though it were His own? . . .

'But,' you say, 'I cannot comprehend all this at once.'

Why, who told you that your powers were equal to God's?⁵

Radioactive Carbon Production

While there is much talk about dating by radioactive carbon, and many supposed dates have been quoted, in one sense the matter recalls Mark Twain's remark about the weather: "everyone talks about it but no one does anything about it." The part about which nothing seemed to have been done was the formation of the radioactive carbon.

A recent article by R. Gold⁶ discusses some experiments on actual formation of radioactive carbon. The experiments were done at the Argonne National Laboratories, 200 meters above sea level, 42° N 88° W, geomagnetic latitude 53° N, in November and December 1966. The

experiments involved proportional counters filled with nitrogen, so that production of radioactive carbon could be monitored directly. Rate of production was found to be $(1.89 \pm 0.08) \times 10^{-7}$ atoms per second per cubic centimeter of standard atmosphere.

There were fluctuations of as much as 25% in the rate of production. Moreover, the rate seemed too high, as had been suggested earlier by Lingenfelter,⁷ i.e., the rate of production is more than enough to maintain the present concentration, so that the concentration must be increasing.

There were some comments about things that might affect the rate of production, such as weather, humidity, and whether the production was over land or over water. These experiments seem to provide more evidence, if more was needed, that production of radioactive carbon is neither a simple nor a constant thing.

An Alert to Creationists

It appears that an attempt is being made to revive the notion that petroleum may have come about otherwise than from organic sources. A report⁸ quotes N. A. Varvarov in the *Economic Gazette*, published in Russia. He is apparently reviving the notion which was due originally to Dmitry Mendeleev, around the beginning of this century. The suggestion is that petroleum may have come from the reaction of iron carbide and water, at great depths and under high pressures and temperatures.

While this is perhaps not very vital, yet it could be of some interest to Creationists. If the origin of petroleum was not, in fact, organic, we need not work at trying to explain an organic origin in a short time. (Although such an explanation can be given; for instance, as the matter is discussed in *The Genesis Flood*.)⁹ On the other hand, interaction with water at great depths could be understood very easily if the carbides were buried at the time of the Flood.

In brief, this is not the kind of thing about which we should go out on a limb, but it may be worthwhile to keep in mind, think about it, and to wait for any further developments.

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

We propose to re-evaluate science from this viewpoint. Beginning in 1964, we are publishing an annual yearbook of articles by various members of the Society and thereafter a quarterly review of scientific literature. Our eventual goal is the realignment of science based on theistic creation concepts and the publication of textbooks for high school and college use.

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