783RD ORDINARY GENERAL MEETING.

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, JANUARY 14TH, 1935. AT 4.30 P.M.

DOUGLAS DEWAR ESQ., B.A,, F.Z.S., IN THE CHAIR.

The Minutes of the Meeting of June 11th, 1934, were read, confirmed and signed. The following have been elected since the last Meeting. As Members: Sidney J. Arkwright, Esq., M.A. (from Associate), Douglas Dewar, Esq., F.Z.S. (from Associate), R. Duncan, Esq., M.B.E., I.S.O. (from Associate), Miss A. Budgen, Charles E. Arundel, Esq., and Capt. A. Acworth, D.S.O., R.N. As Associates: Rev. C. E. Stocks, M.A., B.D., Rev. J. Wesley Smith, Brig.-General W. Baker Brown, C.B., R. G. Lundy, Esq., I.S.O., James McGavin, Esq., M.Eng., A. E. Everatt, Esq., Miss Grace M. Kerr, Admiral Sir George King-Hall, K.C.B., Rear-Admiral Sir Harry H. Stileman, K.B.E., J. Campbell Beattie, Esq., John McKellar, Esq., Samuel Nevin, Esq., M.D., B.Sc., F. S. Harris, Esq., B.S., Ph.D. Hugh Dolby, Esq., James Duncan Bunyan, Rev. H. J. Barker, M.P.S., H. W. Bryning, Esq., Brig.-General F. D. Frost, C.B.E., V.C.

Before proceeding with the ordinary business of the Meeting, the CHAIRMAN submitted a motion of appreciation of the services of the late Dr. James W. Thirtle, in the following words: "That this meeting of Members and Associates of the Victoria Institute, at their first meeting in 1935, desire to record their deep appreciation of the great value of the services to it of the late Dr. James W. Thirtle, M.A., F.R.A.S., Vice-President and Chairman of Council, and their sense of loss by his decease. They also wish to convey their sympathy and condolences to the members of his family and his friends."

The Motion, being seconded by the President, Sir Ambrose Fleming, was then put to the meeting and carried unanimously, the audience standing in silence in token of their sympathy and approval.

The CHAIRMAN then called on the President, Sir Ambrose Fleming, to read his paper on "Modern Anthropology *versus* Biblical Statements on Human Origin."

MODERN ANTHROPOLOGY versus BIBLICAL STATEMENTS ON HUMAN ORIGIN.

By Sir AMBROSE FLEMING, M.A., D.Sc., F.R.S. (*President*).

1. THE STATEMENT OF THE ISSUE.

NO one can deny that in a period covered by one long life, say, in the last seventy years, which is the "Life" of the Victoria Institute, there has been a very marked change in the ideas of the general intelligent public, and in those

of their instructors in scientific matters, as regards the important question of the origin of the human race.

Before the beginning of that period, apart from those so ignorant or careless as to be indifferent to all serious questions, the great mass of people, who thought about it at all, held in a general way that the human race was a special creation as stated in the early chapters of the Book of Genesis. Although the French naturalists, Buffon in 1749, and Lamarck in 1809, had boldly announced their belief in the close bodily relation of man to the anthropoid apes their speculations then seemed destitute of any support in fact and had little influence on popular opinion.

In 1859, Charles Darwin published the first edition of his epoch-making book on *The Origin of Species* and followed it in 1871 with another book on *The Descent of Man*. In the first he applied his theory of natural selection to account for the origin of the vast multitude of animal species, and in the latter the same hypothesis was used to explain the derivation or evolution of the human race from the same animal stock, which also gave rise to the anthropoid or manlike apes, such as the Chimpanzee and Gorilla.

Just before the appearance of Darwin's book the discovery was made near Düsseldorf of a skull cap and fragments which experts declared were those of an extinct primitive race of men of low cerebral development and great bodily strength which are now called the Neanderthal race. In 1863 the English Geologist, Sir Charles Lyell, published a book on *The Geological Evidence for the Antiquity of Man*, and made reference to the ape-like characters of the Neanderthal skull.

Darwin's theory was hailed with delight by those to whom the idea of special creation was unacceptable or impossible. It secured powerful advocacy from skilled controversialists, such as T. H. Huxley, and although it met with strong opposition, its opponents had not, in general, the biological knowledge necessary to offer any effective protest against it. The issue was, however, fairly joined at the beginning of the last quarter of the nineteenth century. On the one side the evolutionists asserted that the human species arose by natural selection from the same mammalian stock from which were derived the anthropoid apes and that the differences between man and ape were differences of degree and not of kind. Man, so they

said, had *acquired* a larger brain, power of upright walking on his legs independent of the arms, a special adaptation of foot and hand, and powers of intercommunication by speech. On the other hand, the opponents pointed out that no sufficient evidence then existed of intermediary forms and that there was an unbridged gap not only in important details of bodily structure, but an enormous gulf in psychical powers for which no sufficient reason had been given. Those concerned with questions of religious belief asserted emphatically that this evolutionary theory was totally at variance with the Scriptural teaching as to man's original perfection, his fall, moral responsibility, and with all its teaching as to the necessity for an atonement for the remission of sin. Since the vigorous controversies of the last century facts have come to notice in the form of fragments of more or less complete skeletons, especially skulls, which Darwinians declare establish the necessary links of connection between man and ape. The widest publicity has been given to these discoveries and so confident are the Darwinian anthropologists of their importance and truth that any doubt or opposition is treated as the result of ignorance or bigotry. The daily newspapers give large space to these theories and the wildest assumptions as to the supposed age of the specimens are made without any critical discussion.

All this has markedly affected popular thought and even that of some religious teachers in the direction of the belief that the earlier chapters of the Bible must be taken as parabolic and not literal truth, but chiefly represent the ignorance of an unscientific age.

Hence some modernists proclaim confidently that the theological teaching of the New Testament also must be modified in accordance with this modern anthropology. But this attempt to make a scientific hypothesis take precedence of the teaching of that literature which millions of people for centuries have been convinced is a revelation from the Author of the Universe to mankind, involves consequences of a very serious nature. The archæological and literary researches of recent times are continually confirming the truth of early Biblical history in many ways.

Hence it is necessary to subject these biological hypotheses to renewed careful scrutiny at the present time, more especially since, at the International Congress of Anthropological and Ethnological Sciences which met last year in London, they were given fresh support and the widest publicity.

2. What Are the Facts?

Let us then, in the first place, state very briefly the facts about these so-called discoveries, apart from any hypotheses which have been built upon them. We will take them in the order of their significance rather than historical succession.

In 1891, a Dutch army surgeon, Eugen Dubois, excavating for fossils in Java, near Trinil, found an upper molar tooth he thought was that of an ape. About a yard away he found the top of a skull and a second tooth, and about fifty feet away a left thigh bone which had human characteristics. These few scattered fragments were given the pretentious name of *Pithecanthropus erectus*, or the "Upright ape-man." It was declared to be an ancestor of modern man.

The strata in which these bones were found was stated to be of late tertiary or Pliocene formation. The especial characteristic of this skull top was the slight evidence of a bony ridge over the front, which brow-ridge is a feature of the anthropoid ape skull, and also its small frontal angle and brain capacity. Some, however, doubted whether these fragments belonged to the same individual and other naturalists regarded the skull-cap as part of the skull of a giant gibbon. The evolutionists, however, have not been content to limit themselves to the actual facts. They have drawn pictures and modelled in clay busts representing their ideas of the complete head of this ape-man.* Forty years' search has, however, revealed no second similar skull specimen in the same locality. The whole theory that this "Erect Ape-man" is a progenitor of modern humanity is built on these isolated few fragments of bone and all the additions are pure imagination.

It is, in fact, a mere supposition that these four pieces of bone so found were part of the skeleton of one and the same animal. Suppose anyone found in a field a bone button and a yard away another similar button and the top of an old bowler cap, and then fifty feet away part of one leg of a pair of trousers, would it be legitimate to assert that all these fragments were part of

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* Such drawings are given in the book *Men of the Stone Age*, by H. F. Osborn (G. Bell & Sons, London), and models of them are placed in the Natural History Museum, South Kensington, London, in the Gallery on the First Floor, West Wing.

a single costume and to proceed to make a drawing of what the complete dress was like when it left the outfitter's shop, and declare that long ago many people were arrayed in this fashion? Most persons, we think, would hesitate before making such a gratuitous assumption.

Apart, however, from any possible inferences which may be drawn from the few discovered fragments as to the bodily appearance of this supposed "man," we have not the smallest means of knowing the true nature of its appearance or its mental faculties. Was its body covered with hair like an ape? Had it a prehensile great toe of an ape or the hand with an opposable thumb of a human being? Had it any powers of speech? Did it make any clothing or covering for its body? Was it, in short, a single step in advance of any of the brute creation in any way? Had it any possibility of educational progress, or were its faculties rigidly limited like those of other animal species? To these and all such questions there is no reply and hence no justification at all for the name "man" bestowed upon it. Can we regard these three or four fragments of some skeleton or skeletons as a truly scientific proof establishing the conclusion that many intermediate vertebrate beings once existed in form and powers between modern man and ancient ape of an antiquity guessed at half a million years?*

Then next in 1907 was found, in the Mauer Sands, near Heidelberg, at a depth of 79 feet, part of a jaw bone with teeth in it of human type, but with a rounded front or an absence of projecting chin bone, which defect is characteristic of the anthropoid ape jaw. The conclusion drawn from this single fragment was that it belonged to a man-like being, who

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* To anyone accustomed to or trained in the exact reasoning and strict definitions required in mathematics or physics, it is a matter for surprise to notice the loose, inconclusive arguments and ill-defined terms employed by some Darwinian anthropologists. For example, there is not a shadow of proof that the four fragments of bone comprising the so-called *Pithecanthropus erectus* belonged to one individual or were deposited in the ground at the same time. But all difficulties are covered up by the adoption of this grand name, which takes for granted the very thing required to be proved. If any similar shaky argument was put forward in a Court of Law, say in a criminal trial, it would be dismissed as inadequate without any hesitation by judge and jury. Nevertheless, the anthropologists venture boldly on this thin ice and find no difficulty in making it the basis of an argument for the evolutionary origin of Man.

was called *Homo Heidelbergensis*. Here again, evolutionary imagination proceeded to make drawings of the head of this Heidelberg "man" declared to be a stage in advance of the Java man. The fallacy of this nomenclature consists in assuming the very thing which has to be proved. The Darwinians desire to have these fragments regarded as stages in the evolution of modern man from an animal ancestor, but until the proof is obtained it is a pure assumption to call them by the name *Homo* or *Man*.

Then, again, in 1911 or 1912, Mr. C. Dawson found in a gravel bed near Piltdown, in Sussex, England, a small fragment of a skull, and shortly after other fragments were found and pieced together by Dawson and Smith Woodward and Father P. Teilhard. As far as the fragments allowed any true reconstruction to be made, it appeared that the brow-ridges characteristic of apes were absent in this case, and the skull capacity was estimated variously at from 1,070 to 1,500 cubic centimetres. It may be here noted that in true modern human beings the volume of the skull may vary between about 950 to 1,600 or 1,700 cubic centimetres. The largest true ape skull has a volume of about 600 cubic centimetres, and that of the Java man has been estimated at about 900 cubic centimetres, which is half as large again as the ape brain. This Piltdown skull, with its smooth forehead, but ape-like jaw, was in accordance with evolutionary ideas christened by the name *Eoanthropus*, or the *Dawn-man*, and asserted to be a sample of a new stage of modern man in process of making. Drawings and busts have accordingly been made illustrating the supposed appearance of the head of the Piltdown man in real life. Nevertheless, learned opinions differ, and the eminent German anatomist, Schwalbe, has asserted that this Piltdown skull is not essentially different from a good-sized skull of modern man (*Homo Sapiens*), and only distinguished by the greater thickness of its bone. Also, the supposed jaw has been stated by more than one expert to be that of a fully adult chimpanzee.

H. F. Osborn gives it as his opinion that the Piltdown man was not ancestral to either the Heidelberg or the Neanderthal man. It would occupy too much space to describe in detail the various "finds" that have taken place in the last few years, all of which are proclaimed as fresh links in the evidence of man's evolutionary development from the animal races.

Thus, in December, 1929, in a cave at Chou Kou Tien, near Peking, were found a skull and jaw remains embedded in rock which were given the name of *Sinanthropus*. It was declared that this Peking "man" was roughly comparable in age with the Java and Piltdown "man," and was acquainted with fire and made implements of stone and bone, and in age these fragments were said to carry us back even up to half a million years. Then, in addition, there was the Rhodesian "man" and the eleven skeletons found in a cave on Mount Carmel and the Mount Carmel child skull, all of which are pronounced to be of immense age, the last about 30,000 to 50,000 years old, on little or no scientific evidence. These lightly-made guesses at age receive, however, a shock sometimes.

About 1930, Professor F. C. C. Hansen, of Copenhagen, received some human bones recovered from a twelfth-century graveyard in Gardar, Greenland. Amongst them was a lower human jaw and a large part of a skull showing characters more primitive or ape-like than the so-called Rhodesian skull, and having close affinities with the Java and Peking skull. True to custom, this Gardar skull was christened *Homo gardarensis*. But buried as it was with the remains of twelfth-century Norsemen, it had to be pronounced as a case of atavism, or the reproduction of a type of man long since extinct. These guesses or assumptions cannot, however, be regarded as scientific knowledge or any real proof of human evolution. That occasional cases of atavism, or "throw-back," or deterioration, are not impossible seems indicated by an account that appeared in 1930 in the *Morning Post* of January 27th (repeated in *Whitaker's Almanack* for 1931) concerning the skull and skeleton of a criminal named Deeming, executed in Melbourne Gaol in 1892 for the murder of his wife. When his skeleton, 38 years later, was exhumed and examined by Sir Colin Mackenzie, it was stated to have very remarkable anthropoid-ape characters. The foramen magnum in the skull was further back than in human skulls and the mastoid processes and skull capacity were similar to those in the Java "man" skull, and it also had similar brow-ridges. The arms were longer than in normal humans, and the thigh bones ape-like in character. The author of this address wrote twice to Sir Colin Mackenzie, the Director of the Australian Institute of Anthropology, to ask if the report concerning Deeming's skull was correct, but did not succeed in

obtaining a reply. If, however, the facts are as stated, it shows that such retrogression is possible.

We must pass on next to notice the more extensive discoveries with regard to a race called Neanderthal "man," the first discovery concerning which was the skull-cap and fragments of a skeleton discovered at Düsseldorf in 1856 to which reference has already been made. Near by bones of a cave bear and rhinoceros were found. In 1887 two skulls and nearly complete skeletons were found near Spy, in Belgium, with flint implements of so-called Mousterian age, from the name of the place, Le Moustier, in France, the caves at which were amongst the earliest inhabited by so-called man. In these caves were found also the remnants of bones of extinct mammals such as the woolly mammoth, woolly rhinoceros, cave bear and cave hyæna.

These Neanderthal skulls had brow-ridges rather less marked than anthropoid apes, a receding forehead, and cranial profile inferior to that of the lowest Australian races and thigh and shinbones of ape-like proportion, indicating a short, massively built body, yet one not able to stand quite upright. In succeeding years up to 1914, a considerable number of fragments of skeletons and skulls were found in various places such as Krapina in Croatia and in the South of France, which had similar characteristics with those of Spy, and were declared to belong to the same Neanderthal race which was once said to be distributed widely over Europe. The distinctive features of these skull and skeleton remains were the marked brow-ridges and retreating foreheads, and large size of nasal opening said to represent a lower type than any of the existing Australian races. Anthropologists such as Schwalbe, in 1901, asserted that the Neanderthal skull occupies a position half-way between the anthropoid apes and modern man called *Homo Sapiens*. Professor H. F. Osborn, in his book *Men of the Old Stone Age*, gives a list (p. 219) of the Neanderthal remains so far found. The fragments or complete skeletons found at these places are asserted to be the remains of a race of low order of intelligence, but it is questionable whether it had advanced so far as to discover fire, though some form of ceremonial burial seemed to have been used. Whether, however, they were stages on the way up in human development, or stages on the way down, remains to be proved.

3. The Advent of Homo Sapiens.

There is evidence, however, to show that the aforesaid Neanderthal race of human-like beings, or as we may perhaps best call them *hominoids*, disappeared from Europe and were replaced or destroyed by the advancing groups of a superior race called the *Cro-magnons*, who were in all bodily respects identical with or superior to modern races of men. These Cro-magnons were a tall and highly intelligent looking people. Their skull and limb characteristics were equal or superior to that of many present-day men. Some were over six feet high. The first complete Cro-magnon skeleton was found in a cave in Western Wales. In 1852 seventeen others were found in a cave at Aurignac in the Pyrenees, and others at Dordogne in France. The skulls are marked by large cranial capacity, 1,500 to 1,600 cubic centimetres, entire absence of brow-ridges as completely as in modern man, and a skull volume exceeding that of many savages of to-day. This race had great ingenuity and handicraft skill and were able to make bone and flint instruments such as knives, scrapers, spearheads, arrow-heads and needles. They probably made clothes of animal skins and had in some degree burial ceremonial customs and the knowledge of how to produce fire. The most interesting and remarkable fact about this Cro-magnon race is their artistic ability and power of making outline drawings or even painted pictures of contemporary, but now extinct, animals, such as the mammoth, cave bear, woolly rhinoceros and others. These are found in caves in considerable numbers and exhibit in some cases great artistic ability.

According to H. F. Osborn, the Cro-magnon race appeared first in Asia and was not evolved from the preceding Neanderthal race. No trace of artistic ability has been found in the latter, but the Cro-magnons must have had great intelligence and also personal beauty. They were, no doubt, capable of self-education and had strongly developed artistic and some religious sense. They appeared first in South-Western Europe and gradually made their way over the Continent, obliterating or destroying the remnants of the Neanderthal race. These Cro-magnons were an outdoor race of hunters, but had probably also reached the stage of constructing log huts in places favourable for hunting or fishing.

4. Summary of Conclusions.

In reviewing all the above-mentioned facts concerning discoveries of remains of supposed ancestors of "man" it is evident that the Darwinian anthropologists, urged by their fundamental postulate that evolution *must* be true, are tempted to give quite undue weight to isolated specimens. I submit that we cannot consider we have any serious proof of the evolution of modern man from an animal stock, from which also are derived the anthropoid apes, in the few scattered fragments of skeletons which have been named the Java, Heidelberg and Piltdown "men," especially as the real nature of these fragments is still questioned by competent naturalists.

The evolutionists are here in the same difficulty in which they are placed with regard to the evolution of other animal species. The palæontological or fossil evidence is painfully small. Whatever may be the truth with regard to the Neanderthal "man," the Cro-magnon man certainly belonged to the same species as the human beings of the present day. They are included therefore amongst the species of our race called in scientific language *Homo sapiens*, or intelligent man. The Neanderthal "men" cannot be placed on quite the same level of intelligence. We have no means, however, of knowing their actual mental state or how far they could have advanced by their own efforts if they had not been entirely obliterated.

Let us turn, however, in the next place to consider the account given of the origin of the human race in that literature which so large a number consider is inspired. We have to discuss in the first place the meaning to be attached to the word "Man" as used in the early chapters of the Book of Genesis.

5. Meaning of the Word "Man" as Used in the Bible.

It is freely acknowledged that in all scientific literature the exact definition of the terms used is a fundamental necessity. If there is any vagueness or uncertainty it is fatal to true scientific thought. Hence, if such words as "Man," "Evolution," "Adapted" or "Acquired" are used in anthropology without exact definition we are no longer concerned with anything which has a right to be called scientific knowledge.

In the creational narrative as given to us in the Book of Genesis i, 26, we meet first with the Divine resolution, "Let us make *man* in our image after our likeness" (Gen. i, 26). This man so made in the Divine image was appointed to have dominion over the animal races. He was therefore to be their superior and not their equal or merely one of them. In the valuable book of Dr. D. E. Hart-Davies, *The Genesis of Genesis* (James Clarke & Co., London), attention is drawn to the fact (p. 64) that in the original writings the Hebrew word *bara* (= create) is only used three times, viz., with reference to the first appearance of Matter, of Animal Life, and of Man as indicating then some very special acts of Divine Power.

We can analyse Matter or material substance into molecules, atoms and electrons and protons, but we have not the very smallest knowledge of how empty space first became occupied with the most rudimentary form of Matter. Neither have we any conception of how Life originated. We cannot in any way bring it into existence apart from previous life. Here, then, are two great gaps which no evolutionary theory has been able to bridge.

Then the use of the same word *bara* with regard to "man" seems to mark another uncrossed gulf which is emphasized by the Divine resolution to create him in the likeness of God. In what sense could man be said to be created in the image of God? God is a Spirit (John iv, 24), and we are told "No man hath seen God at any time" (John i, 18). But we are also taught that the Agent of Creation was The Logos or "Word of God," Who became incarnate as the Christ, and that "by Him were all things created" (Col. i, 16), and that He is the "image of the invisible God" (Col. i, 15). Hence, to create a being in the image of God was to create one in the image of His Son. Could this, however, refer merely to bodily form? Must it not much rather have primary reference to a similarity or congruence in mental and spiritual nature? If so, we cannot properly apply the word "man" to any organism not involving these latter elements. We have no right to limit it to the mere form of the material body or its skeleton of bone, when we are entirely ignorant of the nature of the psychical and spiritual faculties, if any, associated with that body. There is, however, on this point a strong divergence of opinion. Materialistic biologists would not admit any independent existence of something called *mind* or *spirit* apart from the operation of brain. They would

say the brain in action *is* the mind, and nothing exists when the brain is destroyed. There are, however, many strong indications that the mind is something more than brain, although the brain may be the instrument of the mind. The remarkable powers of some very young children in mental arithmetic, music, or artistic gifts which sometimes decrease with age, and the fact that great mental powers are not at all proportional to brain bulk are very significant facts. Some would appeal to certain results of psychical research to prove the survival of some element of the human personality after the death of the body, and others rely on the statements in Scripture proved in many indirect ways to be a production not entirely due to the human mind. Broadly and generally we may say that the widespread, almost universal, conviction of humanity, as shown by burial customs as well as in the phenomena of conscience, is that bodily death does not terminate personal existence in human beings. Then from almost the earliest appearance of man he gave evidence of a religious sense which even in the form of mere animism or polytheism affords evidence of a feeling that there are unseen immaterial powers which control the life of man and to whom he must bow down or worship and submit himself. At a later stage his most elaborate buildings were constructed for the purpose of religious ceremonies. No other animal exhibits the very smallest trace of this faculty or feeling. It is absolutely limited to the race we call human beings. Furthermore, the marvellous intellectual, artistic, ethical and social achievements of this creature called "man" cannot be the result merely of the motions or positions of atoms of matter constituting the brain. Hence, whatever the pure materialist may assert, the verdict of the bulk of mankind is that the body is not everything.

But then we may bring forward other arguments to show that the human mind has faculties of which not the least traces are found in the true animal races. No animal makes for itself any dress or article for personal adornment, or has any sense of beauty, or makes any drawings or representations of other objects or animals. None buries its dead with any signs of expectation of revival, and none contrives or makes any tools or weapons. But all, or nearly all, of these things were done by the earliest true races of men. The animal may possess remarkable powers in some respects, but it has no self-educative ability, and never goes a step beyond its natural instincts. Man

is enormously progressive, and in his very earliest appearance gave evidence of it by constructive powers in numerous ways. If, then, there is such a sharply marked difference between the animal mind and the human mind, the problem the evolutionist has to face is to explain how it comes to pass that if man and the anthropoid apes have a common ancestor all the above astonishing powers and faculties should be present in ever-advancing degree in man, and totally absent in the collateral animal the ape. There is another difference between the animal and "man" to which Darwinians do not seem to have attached sufficient importance, and that is the very different value of the individual life. We consider it not wrong to kill certain animals, provided it is done without unnecessary cruelty, for food or to prevent them becoming too numerous or in self-defence, but we think that the killing of a man is only justified as an equitable punishment for wilful murder or other great crime against the community. If, then, man is merely a transformed and more perfect animal, we may ask at what stage in the evolution, and why, did this peculiar attribute of sacredness in the individual life begin? If, on the other hand, he was a special creation, and not wholly a material body, the reason for this difference is not hard to see. We have not merely to account for the bodily form, we have to explain the appearance of these immensely progressive psychical and spiritual powers as well. Modern anthropology furnishes no sufficient answer to this question. It makes enormous and unjustified demands on time for the evolutionary production of the material body, and ignores completely any source or origin for the invisible agency which uses that body as a musician uses his musical instrument, which is the seat of all thought, sensation, perception and emotion, and without which he could not possibly be described as being made in the "image of God."

Seeing, then, that there are these tremendous differences of opinion, it is necessary to consider a little more in detail the validity of some assumptions which modern anthropology makes.

6. Some Unproved Assumptions of Modern Anthropology.

The first is, that it takes for granted the entire sufficiency of Darwin's theory of natural selection to account for the production of those different non-interbreeding groups of animal forms we call species.

It is not possible to recapitulate all the arguments against the Darwinian theory of organic evolution in a few sentences. The reader may be referred to the author's book, *Evolution or Creation* (Marshall, Morgan & Scott, London), for an attempt to give a fair summary of these arguments.* Since Darwin's day, great progress has been made in our knowledge of genetics or animal reproduction. In particular, the rediscovery of the important law of Mendel has shown many naturalists that Darwin's theory of accidental variations in the ova or eggs, combined with a struggle for existence, is not sufficient to account for the production of those permanent specialized non-interbreeding groups of animal forms we call different species.

It is certain that large variations are possible within the species by natural or artificial selection, but there are definite limits to this which are never overpassed.

If, then, Darwinian natural selection will not sufficiently account for the production of animal species, it will not account for the production of the human species. Moreover, the possession of a similarity in structure at any point is no proof of a close common ancestry. Thus the claw of the scorpion is similar to the claw of a lobster in form, and the eye of a cuttlefish or octopus to the eye of a mammal. But this does not prove any close relation of scorpion and lobster or octopus and sheep. Thus the brow-ridges of the anthropoid apes and those of Neanderthal men cannot be taken as proof of any close origin or close common ancestry of ape and man. The overhanging brow of the monkey assists vision at a distance, because the ape wears no hat with a peak or brim. The same for man before the invention of hats.

In this connection, however, it seems to me that the great error that the Darwinian anthropologists make is to assume

* The following papers read to the Victoria Institute and published in their Transactions are of great value in this connection :—

Dr. Albert Fleischmann, Professor of Zoology in the University of Erlangen, Germany. *The Doctrine of Organic Evolution in the Light of Modern Research.* Trans. V, I., Vol. 65, p. 194. 1933.

Douglas Dewar, Esq. *The Limitations of Organic Evolution.* Trans. V, I., Vol. 64, p. 120. 1932.

Dr. A. Rendle Short, M.D. *Some Recent Literature Concerning the Origin of Species.* Trans. V, I., Vol. 61, p. 141. 1929.

Henry R. Kindersley, Esq. *The Bible and Evolution.* Trans. V, I., Vol. 64, p. 191. 1932.

that organic evolution by natural selection, as Darwin postulated, can take place under conditions which are quite different from those prescribed by Darwin.

The core and essence of Darwin's theory is that there must be a struggle for existence. He assumes that the germs, eggs or ova of any individual vary accidentally in all possible directions. Then next, that those possessing variations which give any advantage to the offspring to continue to exist by obtaining food or escaping from enemies are preserved. Those individuals best adapted to their surroundings live, and those that are not die off or are killed. If, then, conditions are such that there is no great struggle to live, and no great procreation, the source of organic evolution is, so to speak, removed.

Darwinian anthropologists would probably offer the following explanation for the mode in which an ape-like man could have been produced from the same stock which yielded a man-like ape.

If there was some common ancestor of ape and man, which we will call for shortness the C.A. (= Common Ancestor), then, by Darwinian principles, there must have been a great procreation or large numbers of this C.A. Some of these C.A. may have found themselves in forest regions in which they could best survive by dwelling in trees, to be safe from carnivorous enemies and able to subsist on fruits and nuts.

Hence they " acquired," to use the evolutionary term, paws adapted for tree-climbing with prehensile great toe, jaws and teeth adapted for vegetable food and hairy covering to protect them from cold. As no great call was made on intelligence, the brain remained small and skull capacity likewise.

But this great procreation of the C.A. must have forced other members of it out into non-arboreal districts and these had to take refuge in caves and other sheltered places and move much about. Their hind paws then became " adapted " for walking on the ground. As nuts and fruits were not easily obtained, they had to take to a flesh diet and catch fish and birds. This required the manufacture of weapons, and the front paws developed into hands " adapted " for making stone axes, barbs and spears, also for defence against carnivorous animals.

Hence, whilst one branch of this C.A. evolved into man-like apes, another branch developed into ape-like " men." This theory is consistent with itself provided the premises are sound. But when we ask for the facts which support it, we find no ade-

quate proof in fossil remains to demonstrate the existence of the required large number of any common ancestor (C.A.) of ape and man which must be hypothecated if the results supposed are to follow. The Darwinian theory may be valid provided the assumed conditions hold good. But if they cannot be shown to have existed, then the theory falls to the ground.

Even if the Darwinian theory of natural selection could or can be shown to be inadequate for the production of animal species and therefore of the human species, some naturalists are content to postulate a vague indefined, impersonal cause for development which is covered by the world Evolution, and they assume that evolution in the sense of gradual development *must* be true.

If this term is used merely as the name for a *process*, it is not entirely objectionable, but if it is used as a name for an *effective cause* it is quite unscientific and illegitimate. The objector might say that the word Creation is equally vague and indefinable and that we have no knowledge of the exact process.

The reason, however, for resting more content with the term creation than evolution is as follows :—

No agency can bestow any quality or power which it does not itself possess. Thus life can only proceed from already living matter. It cannot be imparted from non-living matter. We can only obtain energy from some source already possessing it. The same for other things.

Now the essential quality of man is that he is conscious of his own existence. He can think and will. He is therefore possessed of personality. Hence, the only true source of human self-consciousness and thinking power must be a Being which also possesses self-consciousness, thought, and will, and therefore personality.

We can, therefore, quite appropriately assert that the origin of man is to be looked for in the creative power of a self-conscious Creator and Supreme Intelligence and Will. We cannot, however, assume that a mere abstract term such as evolution, which merely connotes gradual change, is a *vera causa* in a scientific sense.

Accordingly, it is no explanation at all to assert that man has been evolved from an animal form. We can say certainly that there is evidence of Thought in the Universe from countless metrical facts which are not the product of our own minds, and hence that there must be a Supreme Intelligence as its

Source and therefore Creative Power and Will as the origin of it. But there is no adequate proof of the extensive distribution or large existence of any skeleton remains to justify the assumption that there did exist in past time many intermediate types of organic beings or common ancestors of man and the ape in such numbers and gradually varying types as to justify the assumption of Darwinian evolution. The few scattered remains represented by the Java, Heidelberg, Piltdown, and Peking "man" as far as they are not truly animal may rather be regarded as biological abnormalities or cases of decadence rather than stages in an upward development. There are, then, no sufficient reasons for declaring the evolutionary origin of the human race a definitely certain fact. Certainly none for assuring a general congregation in Westminster Abbey, as did Bishop Barnes, on Sunday, September 25, 1927, that "To-day there is among competent men of science unanimous agreement that man has been evolved from an ape-like stock. He arose probably a million years ago from a tangle of apes which began to vary in different directions."

A second unjustified assumption of the evolutionists is the vast space of time demanded for this evolution of man. Many geologists hold the opinion that in the past there have been one or more periods of intensely cold winters on our earth in which the polar ice caps came down to much lower latitudes than at present. These periods, called glacial, were sandwiched between mild and warm periods of climate called interglacial. The cause of these glacial periods has been much under discussion. Some arguments can be given for an astronomical cause depending on secular variations in the eccentricity of the earth's orbit and the position of its axis of rotation.

In a very interesting book called *The Cause of an Ice Age*, Sir Robert Ball has proved mathematically that under certain conditions of the earth's orbit as regards its eccentricity and combined with a certain position of the earth's axis of rotation periods must come when the winters are of extraordinary rigor and polar ice caps come down well into Europe. He shows that these occur at each hemisphere at intervals of about 21,000 years and that when this glacial epoch is at its maximum, the short warm summers are unable to neutralize the long intensely rigorous winters and consequent cumulative effect of the low temperature. The astronomical theory shows that the Ice Ages alternate in the two terrestrial hemispheres as regards time of maximum.

There is evidence not altogether negligible that a last glacial epoch may have ended not much more than seven to ten thousand years ago.*

The question then arises, Could any gradually evolving intermediate type, or true human being of present type, have lived through a glacial epoch or epochs assuming such did occur? Even if these periods of intense polar cold did happen, it is possible that a central or equatorial district of the earth may have kept a sufficiently mild climate to permit such human life to continue.

The question then cannot be decided by dogmatic statements either way. There is certainly room for difference of opinion. But the fact remains that the evolutionists have not given any unanswerable proof of the pre-glacial period existence of true man. Many of the assumptions as to the great age of certain stalagmite deposits or fossil-bearing strata in the earth have subsequently been shown to be greatly over-estimated. At a meeting of the British Association in 1925 the eminent geologist, Sir Boyd Dawkins, expressly stated his opinion of the impossibility of any certain reckoning of ages in years from any geological data at present available.

In his book *Evolution*, Professor J. Graham Kerr says (p. 212), "Palæontological knowledge regarding man's past history is still of the most fragmentary kind. Each additional scrap becomes the subject of a voluminous literature and the basis of an edifice of speculation out of all proportion to the foundation upon which it rests and not infrequently constructed in complete defiance of the accepted canons of morphological argument." Also on p. 213: "Still less is it justifiable to suggest a probable date for man's appearance on the earth. Statements of this kind involving periods of time reckoned in hundreds of thousands or millions of years are frequently made, but, like other attempts at the numerical expression of evolutionary time, they are not to be regarded as of scientific value."

The evolutionist then makes in the third place a large assumption in his demand that the process by which this being "man" came into existence must be one which is entirely intelligible to his modern descendant. We can give irrefutable proof from

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* *See* Dr. W. Bell Dawson. *The Bible and the Antiquity of Man, p.* 17 *et seq.*

the law of dissipation of energy and from the radio-active transformation of matter that the physical universe cannot have existed for an infinite past time. The universal presence of numerical relations and evidences of design or adaptation or means to an end in the physical universe and its intelligibility by our minds affords the strongest proof that it is not a mere chaos of casual events, but an ordered cosmos, originating in a Supreme Intelligence. Hence, it had a beginning. It does not follow, however, that the nature of that beginning or Creation must be intelligible to our human minds. If it were so, it would show that this Supreme Intelligence is not infinitely beyond but nearly on a level with our own. In rejecting the idea of Creation by Divine Will and Power, the evolutionist then claims that the only kind of beginning which can be accepted as true is one which appeals to his own finite intelligence. He is prepared to accept the Darwinian hypothesis because it is intelligible to him. He dismisses creation by Divine fiat as impossible because he cannot form any clear idea of how it took place. He rejects as untrue any statements about Nature which lie outside the limits of present human understanding and experience. Nevertheless, the evolutionist accepts the theory of evolution, which assumes change without adequate cause, although he admits he cannot see any reason for it. Yet at the same time he dismisses the idea of Divine Creation because he cannot comprehend how it took place. Thus said an eminent naturalist to the British Association a few years ago: "the theory of evolution was a theory universally accepted, not because it could be proved to be true but because the only alternative, special creation was clearly incredible" (Professor D. M. S. Watson). Another equally eminent zoologist declared, "We are more at a loss than ever before to understand the causes of evolution" (Professor H. F. Osborn).

In view of the argument above mentioned, based on the dissipation of energy and on radio-activity, and the additional argument which may be drawn from the fact that we cannot account for the long-enduring radiation from sun and stars without assuming some transformation of matter into radiant energy, many of our most eminent physicists have declared that creation in the inorganic world is an absolute necessity; in other words, it is not a matter of religious faith but of scientific demonstration that the physical universe must have had a

beginning. We men are conscious of our own existence and thinking power, and thus we ourselves can begin, initiate, or create certain things. There should therefore be nothing "incredible" in the idea that the Supreme Intelligence and Will of Deity which is evidenced to us in the phenomena of the inorganic world should be able to create not merely atomic matter and energy but also living matter in organic forms. Moreover, we have the proof of this in all the documentary, historical and circumstantial evidence for the creative work of the Founder of the Christian Church.

We cannot reasonably dismiss as simple legend and myth the accounts of the power of the historical Jesus Christ to create instantly shoals of fish in a lake where no fish were found just before, or to create bread and fish instantly to feed large multitudes, or to create wine out of water at a word, or raise dead human beings to life, seeing that the evidence is overwhelming that He himself was raised to life again, as He had predicted, three days after He had most assuredly suffered physical death of the body by crucifixion.

We have no right to assert that these statements are fictitious unless we have most carefully examined the evidence and found it certainly invalid. Those who have done so are agreed that the bodily resurrection of Christ is one of the most certainly attested facts in human history. But, if so, it certifies all previous Biblical miracles and it was unquestionably predicted in prophesy which is a continual miracle. But there are yet other considerations which show that the evolutionary theory of the origin of mankind by Darwinian natural selection from the animal races cannot be a true account of the matter, for whereas the Biblical or creational account agrees very closely with all the subsequent history and tendencies of mankind, the evolutionary hypothesis fails to explain certain of the most patent facts with regard to human nature at the present time.

7. The Evolutionary and Creational Origin of Mankind Tested by Subsequent History.

It is agreed that a scientific theory which explains some effects but fails to give any explanation of others cannot be a true or full account of the phenomena. It is clear that the

motive power which brings about changes in animal form according to Darwinian theory is an urge experienced by the living individual to continue to exist. But when we come to apply this theory to help us to understand how some form of animal was transformed, on the one hand, into an ape and, on the other, into a man, we find a very remarkable difference between the two transformations. If man and the ape had a common ancestor from which by natural selection they were both developed, we have to explain how it came to pass that whilst the man-like apes owed their survival to great bodily strength, agility and hardiness; on the other hand, the ape-like man owed his survival less to bodily powers and more to mental faculties and development of brain. He triumphed over his animal enemies because able to invent weapons, snares, traps, and especially by the production of fire and means to cook flesh food. His arms and legs were relatively feeble compared with those of the man-like apes, but his brain and mental powers were larger.

But then beyond a certain point this mental development rendered him no service in continuing to live. He developed early a sense of causation and began to be curious about the motions in the sky of the sun, moon and stars. He speculated about the phenomenon of bodily death and arrived at the conclusion that such an event was not the end of personal existence. He developed a religious sense and assumed that there were unseen intelligences which could control the life of man and must be propitiated or worshipped. He acquired a sense of beauty and began to adorn his person and appreciated it in others. All this went far beyond the acquirement of powers necessary for bodily life. There was not a trace of their beginnings in the collateral man-like ape. How, then, did these philosophic, æsthetic, ethical and social qualities arise by evolution? T. H. Huxley, ardent Darwinian though he was, admitted that difficulty at the end of his life. Alfred Russell Wallace, co-enunciator with Darwin of the theory of natural selection, drew the conclusion that whilst man's body might be the outcome of that process, his mind and soul must have been a special creation.

But the theory of evolution not only fails to explain the origin of man's excellence and mental superiority, it also fails to explain his degradation and evil use of his powers. No animal behaves

to members of its own species with the cruelty, deception and violence of man. All human history is the long story of the inhumanity of man to man. The evolutionists try to explain sin as the remains of the brute in man. But that is quite unjust to the true animals. They all set man a very good example and are highly respectable themselves. If, then, evolution will not explain man's rise neither will it explain his fall and hence cannot be a full account of his origin and special powers.

The Biblical account of man's origin may not be altogether free from difficulties, but it is much more in touch with facts than an unproved assumption of a gradual stage-by-stage spontaneous automatic advance from a wholly animal form of life.

8. Some Questions Remaining to be Discussed.

Those of us who accept the special creation of man and the Biblical derivation of the present existing human race from a single pair have, nevertheless, to bring our views into accord with the facts which are well ascertained as to prehistoric " man " and his activities.

As already stated, the evidence as regards the true nature of the Java, Heidelberg and Piltdown fossils is far too uncertain and sparse to build upon it any true scientific knowledge of human origin. The so-called Neanderthal specimens are on a somewhat different footing and have to be fitted in to any theory of the human race. The Cro-magnon man and his successors may, with little doubt, be reckoned as of the species *homo sapiens.*

Many modern anthropologists in their zeal for evolution seem to assume that various species of " man " with progressive improvements, succeeded each other on our globe as evolution operated. But, as a matter of fact, there have always been a large number of groups widely different in development present at the same time on earth. Thus, about a century ago, when in Europe and America we had the most highly cultured, intellectual, inventive and educated populations, there were in Australia, Africa and North America at the same time races using stone axes, dwelling in rude huts, scarcely able to count their fingers and not much more advanced than the Neanderthal " man." Hence, if we go back to the earliest historic times, when there were, as we know, high civilisations in Egypt, Mesopotamia

and Palestine, there is nothing impossible in the view that on the fringe of humanity and at a distance from the centres of civilisation there may have been some members of the race as rudimentary as the Neanderthals. The structure of human nature is such that in isolation the mental and spiritual powers decay, and as the mind becomes inactive and brutalised the facial type becomes animalised also.

These few skull specimens with their brow-ridges, retreating foreheads and heavy jaws may not, therefore, be stages on the way up from ape to man but stages on the way down from man to brute. In other words, instances of deterioration and not stages of upward evolution.

There is another view which may be put forward very tentatively, and that is that between the anthropoid apes and true man with his psychical and spiritual as well as bodily structure, there *may* have been some species of hominoids created with more than ape intelligence, but not " man " in the sense of the word used in the Bible, not ancestors or descendants of the man into whom was breathed the breath of life, destined not for extinction but to inherit eternal life. Biblical commentators have also paid attention to the mysterious verses at the beginning of the 6th chapter of the book of Genesis, in which it is asserted that the " Sons of God " intermarried with the " daughters of men " and that this union was responsible for a great increase in crime, violence and irreligion. We read that ultimately this moral disaster involved the physical disaster of the Flood to " take them all away " and enable a fresh beginning to be made with a better race and higher type of man. Neither time nor space will permit any discussion here of the various views held about these verses, nor of the probably inaccurate statements as to the true dates of the Creation or the Flood, due to the adoption of the Usher chronology, based on the later Hebrew texts of Genesis. That time scale is considerably extended if we take the Septuagint figures for the genealogies in the 5th and 11th chapters of Genesis and, moreover, there is some evidence that the word " son " in the Old Testament does not always mean immediate offspring but is equivalent to descendant. Taking the chronological system of Dr. William Hales, rather than of Usher, it is then possible to put the origin of the true human race consistently back to about the middle of the 6th millennium B.C., or 5411 B.C., and that of the Flood date to the end of the

4th millennium (3155 B.C.), and thus gain all required time for the growth of population from the Creation to the Flood and from the Flood to the time of Abraham.*

The vast ages which modern anthropology postulates for some fossil human remains are based on estimates, often little more than personal guesses, of the age of certain terrestrial strata or stalactitic layers, and there are no indisputable data for these ages and no unquestioned agreement between geologists as to the actual age of certain layers of the earth's crust, or even whether the same class of rocks at different localities have the same age. If we adopt the above suggested chronology, we can regard the Cro-magnon and subsequent races as the ante-diluvian men of the Biblical narrative, and there is then quite sufficient time for the re-population of the world from three pairs after the Flood. The Neanderthal race can then be explained as standing to the Cro-magnon in much the same relation as Australian bushmen or pigmies of Central Africa stood to the European men of the last century. It may be noted that the population of the world in 1914 was estimated at 1,900 millions, and had apparently nearly doubled in the preceding seventy years. Owing to wars, pestilences and other causes the average rate of increase since the beginning of the Christian era must have been much slower. If we take it at a rate which doubles about every 300 years, that would make the population at about 20 millions at A.D. 1. Before population crowded into large cities or contended for the possession of convenient dwelling lands on the earth, the rate of increase may have been again rather larger. It can be shown that the re-population of the earth from three couples after the Flood, as described in Genesis, could have furnished the earth with the above 20 millions in 3,155 years, if the rate of increase was such that the population doubled every 145 years.

If, then, we take the slowest of these rates of increase, say doubling in 300 years, it is possible to show that in 9,000 years a single pair of human beings could multiply into 1,000 million pairs of human beings. If prehistoric man had anything like

* Those who wish to find a justification for these dates are referred to an excellent little pamphlet by Dr. W. Bell Dawson, M.A., called *The Bible and the Antiquity of Man*, published by The Bible League, 40, Great James Street, Bedford Row, London, W.C.1, price 6*d*., which is in every way worthy of careful perusal.

the above rate of procreation, namely, doubling in 300 years, and had been living on the earth for any period like ten milleniums, he would have multiplied to an extent to fill up nearly the whole known world.

Yet where are the remains of such a vast population? All that have been found are a few dozen skulls and skeletons, mostly in very isolated and widely separated places, such as Java, Peking, Piltdown, Palestine, and South France. Surely this fact alone is sufficient to rule out these great ages thus assumed for these few human or semi-human remains. All the facts are much more consistent with the Biblical account and a post-glacial date for the Creation of mankind.

We may note in passing that if the above law of population increase holds good, viz., that the population of the world is now doubling every 70 to 100 years, there would then be about 4,000 million human beings on this earth in the year A.D. 2000, and it is a question whether the earth would support so many. Hence, all talk of the future of mankind a million years hence is futile.

9. Conclusion.

If, then, we give fair consideration to the above objections, it will become evident that this sedulously propagated hypothesis of man's age-long evolution by Darwinian natural selection from a stock which has also produced the anthropoid apes, and that all man's superiority is due to a spontaneous "acquirement" of a larger brain, upright position, improved foot or hand and powers of speech "acquired" over vast periods of time is the product rather of the imagination than based on indisputable evidence. Modern anthropology has to some large degree abandoned the true scientific method of letting the facts suggest the explanations. It endeavours to fit the facts into a preconceived hypothesis of spontaneous evolution. The cardinal error is that it substitutes as the ultimate source of all things an impersonal self-acting or automatic process of improvement, in place of the Will and Power of a Personal, Self-conscious Creator and Father of Mankind. Adherence to the doctrine of evolution is entirely inconsistent with belief in the fundamental doctrines of Christianity and New Testament teaching as regards human sin, redemption and future life, which alone have power to explain and remedy the past, inspire the present and dissipate the deep

shadows that otherwise surround the termination of human life.

It is a matter greatly to be deplored, then, that some ministers of religion should accept as demonstrated truth the unconfirmed speculations of a materialistic anthropology, deny the possibility of miracle or exceptional action on the part of Deity, and assume that no events have ever happened or can happen which are outside of or different from those of our present limited experience of Nature.

In so doing, they are building on the sands of an uncertain ever-changing science instead of resting on the rock of the increasingly verified inspired Scriptures which do not comprise the guesses of fallible minds but the utterances of holy men of God, who spake as they were moved by the Holy Ghost.

Discussion.

The Rev. D. E. Hart-Davies said : I have travelled from Edinburgh to-day in order to hear the paper which has been read by Sir Ambrose Fleming, and I am not disappointed. On the contrary, I am sure that I voice the mind of many when I express a feeling of gratitude for the candour and the courage of the protest to which we have been listening. There is a distinct bias in the scientific, journalistic, and even the ecclesiastical realm against anyone who presumes to question or reject the evolutionary theory of origins. We are all more or less the slaves of fashion. There are fashions in philosophy as there are in dress and custom. Sir Ambrose, fortunately, has reached such a height in the scientific realm that he can afford to utter his convictions without fear of consequences.

Sir Ambrose has rightly stressed the utter paucity of the evidence for the proposition, so loudly trumpeted, that man has emerged from a brute-like ancestry. Ten years ago there appeared in the pages of the *Illustrated London News* two full-paged reconstructions of a creature called *Hesperopithecus*—the male and female of the species being represented ; and the only foundation for this fanciful reconstruction was a single molar tooth discovered in Nebraska, U.S.A.—which Professor Smith Woodward pronounced to be the tooth of a Pliocene bear ! One instance out of many to justify Sir Ambrose's description of the theory as largely a product of the

imagination. Unfortunately, the public can be easily misled by high-sounding names. If the average person who reads in his newspaper about these pseudo-scientific claims could only realise that *Pithecanthropus Erectus*, simply translated, means "A standing-up Monkey-Man"; that *Eoanthropus* means "Man at his dawn"; and that *Hesperopithecus* signifies "The Ape at Eventide," he would begin to appreciate the contention of Sir Ambrose concerning the scantiness of the evidence adduced in support of the theory that man has emerged from the brute, from whom, it is affirmed, he differs not in kind but only in degree.

Mr. PERCY O. RUOFF said: The doctrine of the evolution of Man has been sedulously and persistently proclaimed from pulpit, platform and press. Attempts have been made to bludgeon the public into believing the doctrine. A few years ago a distinguished Bishop wrote that "no educated person could believe in the early chapters of Genesis." Over against this arrogant opinion may be set the fact that many highly educated and intelligent people still accept the simple, plain, and natural interpretation which the record conveys to an ordinary reader, and believe in its historicity. It is most unfortunate that many of the pulpit advocates of the theory of evolution have not perceived that there is far more involved than in setting aside the Genesis account of Creation. They have proceeded to attack, as a consequence of their beliefs, some fundamental doctrines of the New Testament, and even go the length of an assault upon the authority of Jesus Christ, the Son of God.

Sir Ambrose Fleming has given a most valuable paper. The cumulative effect of his argument goes to show the reasonableness of the Scriptural account of Creation, and the Darwinian theory as not being so reasonable. The lecture will do much to restore to many the assurance that the Bible gives a perfectly trustworthy, true and entirely satisfactory account of the origin of man. And more than that, it will give pause to many persons who read it, and will deter them from proclaiming as true what has never been proved. The argument which Sir Ambrose has so ably developed and brings to an issue (which calls for an answer, but which has not been given) is, "how it comes to pass that if man and the anthropoid apes have a common ancestor . . . astonishing powers and faculties should be

present in ever-advancing degree in man, and totally absent in the collateral animal the ape ? "

Author's Reply.

I do not think I need add anything by way of reply to the discussion on my Paper, except to thank those members who have spoken in kind approval of the opinions in it. I may say that since the reading of the paper I have amplified the arguments and somewhat extended the scope of it in a book just published called *The Origin of Mankind* (Marshall, Morgan & Scott, London). The difficulty in discussions with the advocates of Evolutionary theory is that they do not give reasoned replies to the objections raised, but for the most part content themselves with asserting ignorance on the part of the objectors or else the uniform acceptance of the theory which is not entirely correct.

784TH ORDINARY GENERAL MEETING

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, JANUARY 28TH, 1935. AT 4.30 P.M.

CAPT. H. LECHMORE CLIFT, M.B., CH.B., IN THE CHAIR.

The Minutes of the previous meeting were read, confirmed and signed, and the HON. SECRETARY announced the election of the following :—As Members : H. Roderick Carter, Esq. (Life), Rev. T. W. Fawthrop, D.Litt., F.R.G.S. As Associates : Alfred T. Plant, Esq., Lt.-Colonel W. B. Lane, C.I.E., C.B.E., I.M.S. ret., Thomas Wylie, Esq., Rev. S. C. Rees-Jones, M.A., John Carter, Esq., Professor J. W. Leedy, B.S., M.S., Rev. J. Youngson Thomson, Miss E. Ritchie Rice, and as Student Associates : Duncan J. Payne, Esq., and Keith Ormsby Bawtree, Esq.

The CHAIRMAN then called on Dr. K. B. Aikman to read his paper entitled " Race Mixture, with Some Reference to Bible History."

RACE MIXTURE WITH SOME REFERENCE TO BIBLE HISTORY.

By K. B. AIKMAN, ESQ., M.A., M.D.

THE immense advances in the last hundred years in the medical sciences and their application have greatly reduced death-rates, not only in civilized countries but in savage countries as well. As a result there has occurred a general increase of population and thus of migration, which has had important effects—economic, social, moral, religious, and biological—both on the peoples who have provided the emigrants and on those who have received them.

We must accept it as a fact that large numbers of different races cannot live side by side and compete for their daily bread without the production of racial mixture. There is one exception to this generalization : in proportion as there is intense antagonism, usually religious, the mixing of the races will be lessened. The practical drawbacks, however, to such a method

of race-separation are proved by the history of India. We need merely note that race-mixing will take place when opportunity occurs and ask ourselves how far is this process desirable. It is a question that cannot be answered in a word, because the nature of the races crossed is important.

The Primary Races.

Mankind may be divided into three Primary Races: (1) The Negro, black-skinned, with short woolly hair and, typically, African; (2) the Mongolian, yellow-skinned, with long straight hair and, typically, Asiatic; (3) the Caucasian, white-skinned, with abundant wavy hair and, typically, European. These groups may be subdivided, but I propose to do so only in the last case, classifying the Caucasians as the Fair Caucasians of the north and west of Europe and the Dark Caucasians of the south and east.

So great are the differences between these three Primary Races that they are comparable with the differences between the species of the zoologist rather than to those between the varieties.

Effects of Hybridization.

It may be said that the bulk of medical opinion is against hybridization between the Primary Races and that the best eugenic opinion is definitely against it. Thus, Major Leonard Darwin wrote: "Theoretical reasons can be adduced for believing that inter-breeding between widely divergent races may result in the production of types inferior to both parent stocks; and that this would be the result of miscegenation is at all events a common belief." Professor Ruggles Gates also supports this view. The biological objection is based upon the fact that, in these crosses, groups of inherited characteristics remain associated or "segregate," with the result that the offspring has a "chaotic constitution." Each variety of man or of animal, in the course of time, acquires a constitution adapted to its particular mode of life and to the diseases to which it is exposed. When such constitutions are mixed by inter-breeding, a new constitution is produced, which is not adapted to the mode of life of either parent and too often is not fitted for any actual environment whatever.

As examples of simple skeletal maladaptations, we find hybrids with skulls too large to permit of their birth; others with teeth too large for their jaws; and others with either the upper or the lower jaw a misfit with its neighbour. There are, however, many more complicated disabilities, such as altered resistance to disease and disharmonies of the internal secretions. It is found that the greater the difference between the races crossed, the less likely is the result to be beneficial: that the Caucasian is nearer to the Mongolian than either is to the Negro, and that the Dark Caucasian is nearer to the Mongolian than is the Fair Caucasian, and so the Dark Caucasian cross is the less harmful of the two.

These generalizations, to which there may be exceptions, are supported by the American, Professor N. S. Shaler:

> "It is not only a general belief that hybrids of blacks and whites are less prolific and more liable to diseases than the pure bloods of either stock, but also that they seldom live so long. Statistics lacking on this point, I have questioned a large number of physicians well placed for judgment in this matter. All of them agreed that the offspring of a union between pure black and white parents is, on the average, much shorter lived and much less fertile than the race of either parent. My father, a physician of experience and a critical observer, who had spent more than half a century in Cuba and the slave-holding South, stated that, in his opinion, he had never seen mulattoes, that is a cross between white and pure black, who had attained the age of sixty years, and that they were often sterile. The judgment of medical men seems to be that when the blood of either race preponderates, and in proportion as it verges to one or the other, the longevity and fertility increase or decrease."

The Factor of Environment.

This opinion, then, supports the view that distant crosses are usually worse than near crosses. I would, however, remind you that there is more in this matter than heredity. There is environment as well. While it is no doubt hereditary effects which interest us in the first place, we must cultivate a broad outlook and give full consideration to those other effects which are scarcely less

important because they are environmental. That at any rate, is the eugenic standpoint. Race mixture may alter many factors in the environment, such as family-life, language, education, religion, and the whole standard of living and of civilization. We must, then, answer the question: Is the environment of the hybrid likely to be as good as that of the child of pure race? The answer is, No! Often it will be worse even than that of the race of the inferior parent. Too often the hybrid is illegitimate, hating his white father and despising his black mother. But even if his parents are married and there is no racial prejudice against mixed marriages where they live, it is exceedingly unlikely that the environment will be good, for at least one of the parents is almost certain to be reckless, improvident, disinclined to settle down, and with poor ideals of parenthood.

In considering how these factors will affect the offspring, it should be recalled that the character of a child is formed at a very early age, and that it is impossible to over-estimate the importance of the parents as a factor in his environment. No one, certainly no one who has been married, could doubt that the married life of parents of such widely different races as European and Negro would be grossly inharmonious, with consequent disadvantages to the children of the marriage.

The United States presents these problems on the largest scale and has devoted much research to them. Indeed, in many States the American view is crystallized into laws absolutely forbidding marriage between white and coloured persons. Furthermore, as the statistics of divorce show, family life in the United States is less stable than it was. I attribute this instability, in very large measure, to the mixed blood of the bulk of her citizens. It is said that people of foreign birth and their children make up one-third of her population, while another third has had one foreign parent. Under such conditions, it must be increasingly difficult to find two partners for life with similar ideals, tastes and outlook, and there would be a growing tendency for marriages to result purely from physical sex-attraction. This is indeed a valuable ingredient in married life, but marriages of which it is the main foundation are not likely to be a permanent success.

It is noteworthy that many of the American cases to which I refer are marriages between Europeans of different races. If instability is a characteristic of such marriages, it must be

commoner still in the hybrid marriages between the Primary Races, and commoner still when these unions occur without a marriage ceremony.

Crosses between Allied Races.

On the other hand, crosses between races that are closely akin, whether of men or of animals, may result in superior and vigorous offspring, at least in some cases. This is of especial interest to ourselves, because it supports the view of such authorities as T. H. Huxley that the races which intermingled in these islands must have been closely allied by blood; for it cannot be denied that the intermarriages of all the peoples who crossed the North Sea, both with each other and with the earlier inhabitants of Britain, produced a vigorous and efficient people.

That this kinship may have been closer than is popularly supposed is also suggested by the fact that, among the more distinct nationalities of Europe, it is very difficult to decide where to place the line dividing those who are good or bad for crossing with each other. So much is this the case that one authority, Professor Eliot, of Harvard, considers that the marriage of people of different European races produces children weaker and less able than those whose parents belong to the same nation.

American Views and Experience.

The prejudice and emotion that may be aroused by this question of race mixture are abundantly shown in the diametrically opposed opinions, expressed with the greatest vehemence, which may be found in the copious (mainly American) literature on the subject. This vast literature, these prejudices and emotions, not only give a measure of the importance of the problems concerned, but illustrate one of the drawbacks to the close intermingling of different races. Booker T. Washington, himself a coloured man and the founder of the Tuskegee Institute, Alabama, the foremost Negro educational establishment in the world, said that "the problem is not so much what the white man will do with the Negro, as what the Negro will do with the white man and his civilization." Other serious writers hold that the ultimate future of the United States of America will be to be inhabited by a mixed race of Caucasian-Negro

hybrids and mongrels with a dash of Mongolian from the Red Indian stock. It happens that South America is already peopled mainly by such a mixed race, although the proportion of American Indian, that is to say of Mongolian, is higher in most parts; and, with the South American example of instability, backwardness, political and other weaknesses at their door, it is small wonder that the white Americans are alarmed for the future of their country, quite apart from any emotions which might be attributed to race-prejudice.

Nor is political instability the only issue, for the biological weakness of the hybrid stock is attested by such an authority as F. L. Hoffman, of the Prudential Insurance Company of America, who asserts that the people of mixed race in the United States are physically inferior to either the pure white or black. This inferiority, he says, is shown in their weaker vitality and less resistance to disease. This view is reinforced by the interesting observation in the Philippines, that among the men of the United States Forces invalided home the ratio of blondes to brunettes was as 100 to 126. Moreover, it was the brunettes among whom the proportion of mixed bloods, and especially of Negro-white mixtures, would be highest, who suffered especially from neurasthenia and tuberculosis.

Mongolian Hybrids.

When from the Caucasian-Negro hybrid we turn to the Caucasian-Mongolian, we find (according to Dr. J. A. Mjøen, of Norway, who has made a special study of the hybrids between the Lapps, who are Mongolians, and the Scandinavians, who are exceptionally pure Fair-Caucasians) that the offspring are inferior to either of their parents. "They are often mentally and physically unsound; they are more likely to be a burden on the State, both from moral and physical infirmity; they are far more subject to tuberculosis." He urges that "until we have more definite knowledge of the effect of race-crossings, we shall certainly do our best to avoid crossings between widely different races." "Crossings," he repeats, "between widely different races can lower the physiological and mental level."

Professor H. Lundborg, of Sweden, supports this view and urges that "we must also pay great attention to immigration so that inferior individuals belonging to foreign races cannot

enter the country and settle without any hindrance. A mixture between nations who, from a race-biological point of view, stand high and others containing lower race-elements is certainly to be condemned."

In connection with the Mongolian-Negro hybrid, there is little recent scientific observation. As the Mongolian is closer, biologically, to the Negro than is the Caucasian, my impression is that the Mongolian-Negro cross is less detrimental. Cases occur, for example, in Jamaica, but they are not regarded with enthusiasm, either socially or biologically.

Sociological Problem of Race Mixture.

That is the biological side, but we must remember that immigration of different races leads to the complication of a whole host of administrative problems which are all too difficult already in modern civilization. One need only instance the segregation of races, as in the " Jim Crow " cars on railways in the Southern States; the racial friction which often expresses itself in lynchings; the economic problems and trade disputes due to wage-cutting and to different standards of living; the legal problems, often of the most distressing kind, due to laws in the United States rendering illegal marriages between white and coloured persons, and the profound effect upon the life of the nation produced by the Negroes and hybrids.

It is not generally realised how great is this effect already. It is likely to become even greater. Not only because the number of people with some negro blood in their veins is increasing (and I would remind you that there are some twelve million Negroes and coloured persons in the States) but also because the Negro is increasing in material prosperity and in education. It will become progressively more difficult to limit his political power in the Southern States, and his political power in the North is much greater than it was before the war. Little wonder, then, that there are many Americans who feel that all is not well with their culture, art, music, sexual-morality, family life and religion, and who attribute much of the alleged deterioration to the effect of the extraordinary mixture of races and colours and unassimilated aliens present in the " Melting Pot," as Israel Zangwill termed the United States.

A Controlled Experiment.

But for those who feel that we cannot yet see the end of the greatest experiment on earth in race-mixing, much information may be gained from history, and particularly from that of the Israelites, after they began freely to intermarry with foreigners. Before an audience such as this, it is unnecessary to say that foreign marriages were forbidden to the Chosen People, but it may not have struck all of you that this prohibition was so absolute that marriages with the closest relatives were to be preferred to those with foreigners. Thus in the beginning, the Son of the Promise, Isaac, was begotten by Abraham of his half-sister, Sarah (Gen. xx, 12). In the next generations, as there were only a few families of the Chosen, cousin marriages were the rule, and after Esau had disappointed his parents by marrying two Hittite girls (Gen. xxvi, 34) he did his best to rectify this error by taking to wife the daughter of his half-uncle, Ishmael. It may be of interest to note that Ishmael was the son of the Egyptian bond-maid Hagar and that this racial mixture produced a different type from the Israelite. It was said of Ishmael, before his birth, that he was to be a wild man, his hand against every man and every man's hand against him, and that he should dwell in the presence of all his brethren. That proved to be true, not only of Ishmael but also, literally, true of the Arabs, who have always been regarded as his descendants.

Later, on the entry into the Promised Land, all marriage was sternly prohibited with foreigners (Deut. vii, 3–5), who were to be exterminated, and it is definitely stated that this was to prevent the bad influence of foreign spouses, who would inevitably turn the Israelites from God and His Laws. You will remember that this prohibition was disregarded, with disastrous results. The people "forgot the Lord their God and served Baalim and the Groves," and were promptly punished by an invasion from Mesopotamia and slavery (Judges iii, 7–8). Centuries later, King David fell into the same sin, when he committed adultery with Bathsheba, the wife of Uriah the Hittite. It was in accordance with the perfect inevitability of divine justice, that punishment came as the result of similar wrongdoing by the son of that marriage, for Solomon's mother was Bathsheba. The union between David and a Hittite was

one between people of kindred races, and, as often happens, this produced a child of remarkable vigour, for Solomon was not only intellectually pre-eminent but exceptional physically. It was true then, as it is to-day, that the mainsprings of action rest not in the intellect but in the emotions, and so the greatest intellect in Israel fell a victim to the charms of those alien women who were to be his own undoing, as well as that of his Royal house and of his subjects. It cannot be doubted that the influence of his Hittite mother had rendered him more susceptible to this error, for a man's ideal of womanhood is usually based on his ideal of his mother, and the least Bathsheba could have done would be to remove from her son's mind all prejudice against a foreign marriage.

The fact that she was, or had been, a heathen must also have implanted in his heart some tendency to turn aside after other gods—a tendency which proved irresistible in his old age, under the spell of his heathen bed-fellows (1 Kings xi, 4).

Other sons of David—his first-born, Amnon, by his wife Ahinoam the Jezreelitess, and Absalom, by his wife Maacah, the daughter of Talmai, King of Geshur—proved unsatisfactory, possibly for the same reason. In the next generation it was the follies of Rehoboam, the son of Solomon by Naamah, an Ammonitess (1 Kings xiv, 21), which rent the Kingdom of Israel from Judah and deprived the House of David of most of its subjects.

In the northern kingdom there was similar disobedience, and we read of the nuptials of Ahab with the Zidonian princess Jezebel, followed by Baal worship with its human sacrifices. Foreign marriages led to foreign alliances and entanglements, in which the forces of Israel were squandered in campaigns which were not in the national interest. Finally, the cup of their iniquity was full, and after repeated warnings retribution overtook them.

They were enfeebled by their casualties in war and by the depravities and vices introduced by their foreign wives. Their *morale* must have been weakened when, debauched by the emotional worship of a multiplicity of godlings, they thought with aching heads of their traditions of military prowess under the pure religion of Jehovah. Then the once invincible Israelites fell an easy prey to the invader, who swept them away into a long and terrible captivity. So complete was the desolation

of their land, once flowing with milk and honey, that the arrogant Assyrian could boast, "As one gathered eggs that are left, have I gathered all the earth: and there was none that moved the wing, or opened the mouth, or peeped" (Isa. x, 14).

To the southern kingdom this might have acted as a salutary warning of the disastrous results of exogamy, but it passed unheeded, and we learn from Jer. iii, 11 that treacherous Judah became worse than backsliding Israel. Everywhere there was corruption of justice and morals, and the people gave themselves over to the most abominable idolatries. When the prophet's last call to repentance had been rejected the hour struck and, more than a century after the enslavement of the northern kingdom of Israel, Judah was carried captive to Babylon, with her princes dead and her King Zedekiah blinded and in chains. The Captivity illustrates another undesirable effect of race-mixture. The religious instruction of the Israelites necessarily centred on the Hebrew Sacred Writings, which tended to stabilize their language, just as the Bible affects our own speech in England to-day. Nehemiah gives us a graphic picture when he writes, "In those days also saw I Jews that had married wives of Ashdod, of Ammon and of Moab; and their children spake half in the speech of Ashdod, and could not speak in the Jews' language, but according to the language of each people" (xiii, 23, 24). In the brief space of seventy years so many of the Jews had forgotten their own tongue that when Ezra tried to teach them the law, it had to be interpreted from the Hebrew (Neh. viii, 8). The prophet Nehemiah had first-hand experience of the evils, both direct and indirect, of race-mixing, and it was not without reason that, after the return from Babylon, he cried to the inhabitants of Jerusalem, "Shall we then hearken unto you to do all this great evil, to transgress against our God in marrying strange wives?" (xiii, 27).

Since the Israelites of the northern kingdom had long abandoned the worship of Jehovah, they would not have been using the Hebrew Writings in their Assyrian captivity, and so we conclude that they, too, rapidly lost their own language and with it the easy means of returning to their old worship. Thus it could be said with truth, "they shall wander from sea to sea, and from the north even to the east, they shall run to and fro to seek the word of the Lord, and shall not find it" (Amos, viii, 12). This state of affairs may be paralleled in our own

time on the Dutch island of Kisar, near Timor and some 500 miles from the Equator. There, nine Dutch soldiers were left about 150 years ago, and their descendants, although they remained fair-skinned and often blue-eyed, were found to have lost their language, and with it their civilization and their religion. The unerring wisdom of the prohibition of foreign marriages is clear throughout the Bible, and the one apparent exception supports this view. This was Ruth, the Moabitess, and I believe hers was the only foreign marriage which was not condemned. The obvious reason for this exception was that Ruth possessed such high moral qualities that, after 3,000 years, she is still held up as one worthy to have been an ancestor of Our Lord and as a shining example to all women. We have seen (Deut. vii, 4) that it was not to prevent biological deterioration, but environmental contamination, that foreign marriages were prohibited, and from what has gone before you have learnt that it is hybridization between Primary Races which produces biological deterioration, while the effects of near crosses are liable to cause bad results by the environment of the offspring. These facts demonstrate anew the wisdom of God. When He proposed to establish a Chosen People in a Land of Promise, He might have sent them south in Africa, or to the east in Asia. The temptation to race-mixture is very strong, and we do not doubt God knew that Israel would succumb to it and that if they were sent to a land inhabited by Negroes or by Mongols, the result would be hybridization and irreparable harm. Palestine has many advantages of climate and fertility and strategic importance but, from the biological standpoint, it had the inestimable advantage of being inhabited by kindred peoples. It may be remarked that although the ethnology of the peoples of Palestine 3,300 years ago is still obscure there is no reason for thinking that the tribes, with whom the Israelites married, belonged to different Primary Races. There is no mention of their marrying Ethiopians, and if there were I should be ready to argue that these were as likely to be Dark Caucasians as Negroes.

Serious biological deterioration is not to be expected from crosses between healthy kindred races, and although the Israelites soon mingled their blood with that of their neighbours the practical effects of this were environmental. Thus the race-mixture which took place in Palestine led to great harm, but

the stock was not damaged beyond hope of repair. The evils caused by environment could be eradicated by a change of environment and, if need be, by " chastisement with scorpions." Thus we learn that the inhabitants of the southern kingdom who were captive at Babylon were brought to realize that their misfortunes were due, above all, to their idolatry, and so those who returned to Jerusalem were permanently cured of this sin.

Similarly, we read in 2 Esdras xiii, 41–42 that the Ten Tribes who were captive in Assyria " took this counsel among themselves, that they would leave the multitude of the heathen, and go forth into a further country, where never mankind dwelt, that they might there keep their statutes, which they had not kept in their own land." Thus we see that in the case of both the southern and the northern kingdoms the damage caused by environmental influences was made good and the remnants, which were saved, were fitted for the great tasks which lay before them. It is surely remarkable that Moses and Joshua nearly 3,500 years ago should themselves have devised laws in accordance with the latest scientific discoveries; that they should have declared that the chief effect of marriage with the Canaanites would be environmental (Deut. vii, 4) and would be harmful; and that they should have striven to prevent mistakes which the men of our own race, in the United States, in British Colonies, and even in England, are still making to-day with results which are disastrous.

The explanation of Moses and of Joshua, themselves, was that they were inspired by One to whom the secrets of nature were an open book, and this seems to be the only possible explanation. The fate of the northern kingdom of Israel and that of the southern kingdom may be regarded as two clean scientific experiments, both on a nation-wide scale. The second was a control. Both produced the same result and clearly demonstrated cause and effect. If the race mixture between the Israelites and the Canaanites produced bad results, which is undeniable, and if these peoples possessed considerable racial affinity with the Israelites and differed from them less than do the most widely separated races of Europe for each other, which I believe to be the fact, then we should expect an even less favourable result when the Primary Races are crossed. What do we find ?

Possibilities of the Future.

Any race which is in possession of a land should take all these facts into consideration. Such a race is morally bound to give the closest attention to the effects of race-migration, not only as it affects the present generation of its citizens but as it affects the future generations, both as regards their heredity and their environment.

It is surely of great significance that all the peoples of our own Celtic-Anglo-Saxon stock who have had the most practical experience of these problems are doing their utmost to exclude the Mongolian and the Negro races from their countries. I need only refer to recent legislation in Canada, Australia and the United States to show this. But this is much more than an Imperial problem, it affects the future of the white race itself and through it the future of civilization.

The Report of the Census Director of South Africa stated that, unless increased by accessions from abroad, the European race in South Africa "must for ever abandon the prospect of maintaining a white civilization, except as a proportionately diminishing minority in face of an increasing and ultimately overwhelming majority. It may then be forced to abandon its domination or even abandon the country." These are the words of a serious official report, and they should make us think. The Negro in the past has not shown any great genius for stable political institutions. The native states established a century ago in South Africa ended in collapse. The Black Republics of Hayti and Santo Domingo in the West Indies are examples of Negro rule after a considerable degree of white influence, and their record is one of wholesale massacre. Even in Liberia, at the present day, slavery and torture are common. Thus there is good reason to fear that if Africa is to fall back under Negro rule, it will deserve its name—the Dark Continent.

When we turn to the Mongolian races of Asia, we must recognize that, speaking practically, they are the most serious menace to the Caucasian race. Even now we are feeling severely the commercial competition of one of them, and there is nothing incredible in the idea of another invasion of Europe from the East. It has happened several times before, and evidences of these invasions remain, not only in written history, but in the Hungarians and the Lapps, who are Mongolians, and in the Alpine Sub-race, which is Asiatic in origin.

We have all heard of the Yellow Peril, and a recent writer expresses his opinion of its reality in three words: "*Ex oriente—Nox!*" That is one view of the ethnological future. For us it is a gloomy one, but there is another—and you may take your choice—which is that the world will ultimately be peopled by an intimate compound of white and yellow and black. It may be! Some people profess to look forward gladly to that time when national rivalries shall be no more, because nations will have ceased to provide that variety which is the spice of life, all sunk into a monotonous morass having the colour of coffee and milk. But if these alternatives are to be avoided—and I hope that this is still possible—it can only be through our studying the problems of race-mixture and by acting before it is too late. The impression I have formed is that, until our real knowledge of heredity has made very great advances, any policy of encouraging racial mixtures is a gamble which is unjustified. Our progress will be more certain and more rapid if we apply the principles of positive and of negative eugenics to the races which already exist. Eugenists are absolutely confident that all these races can be improved biologically, and no one denies that they are also capable of improvement socially and environmentally.

The Need for "Segregation."

Difficult as it undoubtedly is, some form of mass-segregation of races seems to be desirable, but by this term I do not mean complete segregation. The ideal would seem to be that teachers, administrators, judges and doctors should have access to the more backward races and that interchange of ideas should be allowed full play. In this way, each people would make its contribution to the culture of the world and would have the opportunity of fuller development. If some of these races showed themselves more fitted than others to certain districts of the world and proved their survival value, they would tend to spread, and the present inhabitants of these districts would in time be reduced to vanishing point. This has been the course of biological progress in the past and it is still its truest course in the present state of our knowledge.

We have seen that the effects of hybridization between the Primary Races are bad, both biologically and socially, and that

they are likely to be especially bad if one race is primitive, while the other is in an advanced state of civilization.

Among primitive peoples of the same Primary Race, there appears to be less objection to intermarriage. Biologically there may be an accession of vigour and the production of more efficient types; on the other hand, there may be degeneration. In the present state of our knowledge we cannot predict the result, and so are not justified in encouraging such unions. We must bear in mind that these Primary Races are capable of much subdivision and we must carefully study the mass of material which is available, if only because this is essential to any intelligently planned scheme of Empire migration.

Socially, intermarriages between some of these primitive peoples may be unobjectionable, because they are sufficiently primitive to have escaped the devastating complexities of civilization, but each case must be considered on its merits.

Among civilized peoples of the same Primary Race, intermarriage is less desirable than is commonly thought. Biologically, there are the same possibilities of greater vigour and of degeneration, and the distinction between Fair Caucasians and Dark Caucasians is probably important. Socially, however, the complexities of the civilized mind militate against the harmony of such married lives, and this must have great weight with the eugenist.

Much of what I have said may be summarized in one verse of Kipling's poem, "The Stranger":

> "This was my father's belief
> And this is also mine:
> Let the corn be all one sheaf
> And the grapes be all one vine,
> Ere our children's teeth are set on edge
> By bitter bread and wine."

Discussion.

The Chairman, Dr. H. Lechmere Clift, said: I have always been interested in the problem of Race Mixture. I was born in India, and had part of my schooling there. A large slice of the rest of my life was spent in China; and I have travelled extensively elsewhere.

All these countries present the same difficulty of mixed races.

We have to thank Dr. Aikman for his extraordinarily interesting contribution to this question. He has brought to our attention facts that cannot be disputed; and some quite unknown to me before. It is a problem crying aloud for some solution.

Legislation is made perplexing because race mixture results not from a combination of principles but as a consequence of *passions:* and human passions defy all rules and regulations. I heard a Professor of Midwifery, at Edinburgh University, tell his students, "Gentlemen, in the course of your professional career, you will have anxious mothers bringing to you their delicate daughters. The mother wants to know whether the condition of the daughter's health is enough to justify her entering upon a married life.

"Gentlemen, you need not on these occasions worry yourself as to whether your verdict is justified or not—whether you are right to say, 'Yes' or 'No.' Whatever you say will make no difference—the parties concerned will do what they *want* to do; and they won't do what they *don't* want to do!"

The mixture of races is a very wide question—many-sided and perplexing. The mixture is full of perils. In a few cases it may have its advantages. Take the Northern Chinese—they have been segregated for centuries from the rest of the World, and are largely a pure race. The Southern Chinese are a mixture, especially in Canton, which has witnessed the impact of several nationalities. The Northern Chinese may be physically powerful; but in intellect he is no match for the Southerner, in spite of the relaxing climate the latter has to endure.

Dr. Lin Wuh Teh, the foremost medical man that China has produced, declares that a combination of Cantonese and Anglo-Saxon parents produces the finest stock in the World.

An extraordinary British genius, living to-day, has Eastern blood in his veins—and some attribute his genius partly to this fact.

These examples are, I think, exceptions that prove the rule, rather than otherwise. Dr. Aikman has given us very serious food for thought. Race Mixture is one of the gravest perils that the World will have to face.

The Rev. H. C. MORTON, B.A., Ph.D., said that in his judgment we had had a most valuable paper, for which he thanked Dr. Aikman.

There was a special satisfaction in listening when one of one's own convictions was fortified with new reasons and carried forward with good logic to new entrenchments. Since he last took part in a Philosophical Society discussion, he had been round the World and visited many parts of the British Empire. The importance of the subject brought forward to-day was emphasised almost wherever one went. He had spent a considerable time in Canada, and only the day before a lady long resident in Canada had said to him, " For Canada the hour is now too late ; the mixture of races is already largely accomplished." One hears continually in Canada of the difficulty which a Briton has in gaining admission, and the facilities which are offered to almost every other race, and the number of Slavs now settled in Canada is great, and intermarriage common. He had been specially in a province—Alberta—which is under the influence of the States, and in the States the problem is truly acute. Lincoln's great mistake was in refusing to repatriate the freed negroes. How dire the peril is shown by the fact that in the 'eighties there were over forty negro millionaires in New York City, and to-day it is estimated there are about one hundred. Dr. Aikman's environmental effects are bound to be very marked. In South Africa they say there is such a thing as the honour of a white man, and such a thing as the honour of a Bantu, but no one ever hears of the honour of a half-breed. He believed that it was an instinct among the British people that the purity of the British race must be maintained.

But he wanted to criticise one point, namely, the use of terms, particularly on page 44. Crosses between Primary Races are described as " hybrids," while crosses between mere varieties of the same race are called " mongrels."* Now, he believed it was ethnologically well established that all the tribes which came to Britain were closely related varieties of one race ; therefore Dr. Aikman would call us all " mongrels." But against the use of that term he protested and earnestly appealed to Dr. Aikman. The object of this paper is specially the preservation of the purity, and the dignity, of the British race. But the word " mongrel " is a word of distinctly bad connotation and would defeat the purpose of the

* Text amended, *see* author's reply.

lecture if it became used in this connection. He would ask Dr. Aikman to call crosses between the Primary Races " mongrels," and to use the respectable word " hybrids " for crosses between the varieties of the same race. In Horticulture, for example, " hybrid " is a very respectable and honourable term, and " hybrid " roses hold a high place. Pitman's dictionary gives " hybrid " as meaning " mongrel," and " mongrel " as meaning " hybrid " ; and thus it would appear that Dr. Aikman is at liberty to exchange his terms.

There are people who say they do not see why the Caucasian should not marry a Mongol or a Negro. They are not sure that the result will be bad. Dr. Aikman calls such intermarriage a " gamble "—a very good word—and whether we all think that gambling is essentially wrong or not, we all agree that to risk losing what you cannot afford to lose is a bad gamble ; and no Briton can afford to lose the purity and the dignity of the British strain.

Mr. R. DUNCAN said he had heard the relations of whites and natives discussed by a distinguished preacher after a visit to South Africa. The conclusion reached was that while it was a Christian duty to regard the black man as a brother we should stop short of making him a brother-in-law. Behind that summing up there was doubtless the conception that variety of race and purity of race contribute to enrich the human scene.

In watching foot soldiers marching, he (Mr. Duncan) had not seldom been struck by the appearance of a marked Saxon type of countenance among men of Midland and South English regiments. That this type, deriving from so early a stratum of the population, should reassert itself, notwithstanding much probable intermingling of strains in the intervening centuries, suggested to him that perhaps adverse results of mixture were not necessarily permanent but tended to fade out—or be cancelled out—in process of time.

He instanced the case of the Pitcairn Islanders as one in which mixture of dissimilar races had taken place, in laboratory conditions so to speak, with what seemed to be favourable results.

It seems open to doubt whether the case of Bathsheba and her husband has been rightly interpreted for the purposes of the lecture. The fact that the name of her father is given suggests that she was Israelite, not Hittite. Uriah, too, from what we are told of him,

was evidently a man of noble feeling, and probably a worshipper of of the God of Israel.

Lieut.-Colonel HOPE BIDDULPH wrote : Observations on the paper on " Race Mixture " read at the Victoria Institute on January 28th, 1935 :—

Page 50, *para.* 1, *lines* 15–16. " Half-brother." *Ishmael* was not half-brother to *Esau*, but was his uncle.

Page 50, *para.* 2, *line* 11. "*Bathsheba* "—was she a Hittite ? She was certainly the grand-daughter of Ahitophel (*see Blunt's Scriptural Coincidences*), and her husband Uriah was a Hittite, but she appears to have been an Israelite, so the remarks about her training of Solomon do not seem fully justified.

Page 51, *line* 16. Solomon's *old* age, as quoted in I Kings xi, 4, must have been due to the life he led, rather than to length of years, for he does not seem to have been more than 56 when he died, having forfeited the conditional promise of long life made by God in I Kings iii, 14.

The worst results of mixed marriages are those quoted in Genesis vi.

Mr. WILLIAM C. EDWARDS said : This is a vast subject. I think that the most helpful guide is the tenth chapter of Genesis, giving the descendants of the three sons of Noah. Differences of races seem to be in skulls and temperaments rather more than the colours of the skin. Are there any really pure races ? All races seem to possess almost endless potentialities of variations. I think that the purest races are probably the Welsh, the Jews (Israelites) and the Brahmins ; but all these also show varieties.

The Welsh seem to have arrived in Britain 1,000 years before the Jews left Egypt. Their languages have strange affinities, but the Welsh claim to be the descendants of Gomer, the eldest son of Japheth. It is remarked that the Welsh are sometimes mistaken for Jews. Amongst the Jews you have great differences. There is the fine Abrahamic type, the sleepy Isaac type and the keen, grasping, cunning type that we can associate with Jacob. Amongst them there is also found at times a type which is almost that of the negro. These may be descendants of the " mixed multitude " of Exodus

xii, 38. The Brahmins, through their strict caste laws, should be very pure, but the Brahmins whom I have seen in Benares are very different from those of Assam, or those below the Dravidian line.

Mixing of what may be called *fixed* types is very dangerous, *e.g.*, the mixtures of Irish and Scotch as seen in Glasgow, and the mixing of Welsh and Irish as seen in Cardiff. What a difference a new environment can make in a very short time! I have been beyond measure amazed at the beautiful type of Jewish children in their new colonies of Palestine. The Ghetto type seems to have quite disappeared. The Jewish race seems to be rejuvenated in their old God-given home. As regards Bathsheba, she was *not* a Hittite, but, as Prof. Blunt has shown, the daughter of Eliam, the son of Ahitophel (II Saml. xi, 3; xxiii, 34). My father was a very pure Celt, but my mother a fine specimen of a Saxon, although on her side there was some Huguenot blood, and with it, thank God, almost hereditary piety. I think that when marriages unite people of real piety there is little danger. Pure religion seems to produce pure stock. If Christians were more careful to marry "in the Lord" there would be less fear for their progeny or the degeneracy of our race.

Author's Reply.

Dr. H. Lechmere Clift. The Southern Chinese are a mixture of Mongolians of kindred races which often produces good results.

We should need to know the criteria used by Dr. Lin Wuh Teh to determine "the finest stock in the World," for varying values may be assigned to physique, intellect, resistance to diseases, etc.

Genius is a combination of qualities, at present impossible to forecast, but in racial mixtures we should expect wide variations from the normal, some in the direction of genius, some the reverse.

The Rev. H. C. Morton, B.A., Ph.D. The terms hybrids and mongrels, as I used them, have been applied to the human race by good authorities and were not considered interchangeable. The old idea was that hybrids were crosses between different species and were sterile, while mongrels were not, but this distinction has broken down in modern biology. Although some biologists regard the primary human races as different species, some anthropologists would probably not accept this conception. From a genetical

point of view, however, all human racial crosses may be regarded as hybrids. In nearly related races, crosses may be hybrid for only a few characters, while in more distantly related races they will be hybrid for many. The term "hybrid" has, therefore, been substituted for "mongrel" in the foregoing paper to avoid offence. In any case, the term "mongrel" is inapplicable to most Britons, as the races, Anglo-Saxon, etc., which entered Britain from the east coast were closely akin to those which came in from the south and west. They may be compared with white and brindled bull-terriers, which may be crossed without producing mongrels. Even with dogs, however, some more distant terrier-crosses are highly esteemed and have led to new breeds, while the "half-bred" crosses of other related types, such as bull-mastiffs, find an honoured place on the show-bench. These are comparable to near-crosses in man. More distant crosses, such as dog and wolf, are a gamble, which may produce an animal of fine physique, *e.g.*, an Alsatian dog, whose temper may either be good or so bad as to render it valueless. Such distant crosses also have their human counterparts.

Mr. R. Duncan. The results of race mixture tend to be permanent, because the individual is a mosaic of different inherited factors. These factors retain their characteristics, which may reappear after many generations, even although they may be "recessive" under certain conditions.

A very slight admixture in a race may be practically bred out in time, and if the Saxon type of countenance was very common, or was due to "dominant" factors, in the ancestry of the Midland and Southern English, then they would appear to be of markedly Saxon type.

Regarding Bathsheba, it is not certain that she was a pure-bred Israelite, and it is clear that, before her marriage, she was either not of the Hebrew religion or extremely lax in her observance of it, as she ignored the very strict law against foreign marriages.

If she was an Israelite, the not unreasonable assumption was made that, on her marriage, she would take the nationality of her Hittite husband and probably adopt his religion. This was presumably Hittite or pagan, as we are nowhere told that he was a convert to Israel.

Lieut.-Col. Hope Biddulph is, of course, correct: Ishmael was not the half-brother but the half-uncle of Esau. Regarding Bathsheba, *vide supra*.

Mr. W. M. C. Edwards. The fact that all races seem to present almost endless potentialities of variations does not prove that they are not pure, though I believe few, or none, are, if we go back sufficiently far.

That the Jews are extraordinarily mixed is evident from the Biblical account of post-Captivity Jewry and from their pre-Captivity mixed marriages. The Ashkenazim Jews are also of very mixed, largely Mongolian, ancestry. The Ten Tribes of the Northern Kingdom were frequently rebuked for mixed marriages.

Bad as are some of the Irish-Scotch and Irish-Welsh mixtures, these peoples are more closely akin in blood and environment than many to which reference has been made, and so we might expect " wider " crosses to be worse.

Similarity of good religious ideas in parents is of the greatest help in producing a favourable environment for the offspring, but it cannot alter hereditary factors, and it is asking too much to expect it to produce " pure stock " from *e.g.*, a Caucasian-Negro cross.

785TH ORDINARY GENERAL MEETING

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, FEBRUARY 11TH, 1935. AT 4.30 P.M.

THE REV. T. W. FAWTHROP, D.LITT., F.R.G.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed, and the HON. SECRETARY announced the following elections: Alfred E. Oddy, Esq., L.D.S., Mrs. J. H. Monins, Miss Muriel A. Hart, Howard Nation, Esq., Pastor Edward H. Tait, F.R.G.S., Rev. Harry T. Rush, as Associates; Albert E. Hooper, Esq., B.Sc., as Missionary Associate; and James Munro Symington, Esq., as Student Associate.

The CHAIRMAN then called on the Rev. D. E. Hart-Davies, M.A., D.D., to read his paper on "Biblical History in the Light of Archæological Discovery since the Year 1900." (Being the Gunning Prize Essay, 1934.)

BIBLICAL HISTORY IN THE LIGHT OF ARCHÆOLOGICAL DISCOVERY SINCE A.D. 1900.

By The Rev. D. E. HART-DAVIES, M.A., D.D.

(*Being the Gunning Prize Essay*, 1934.)

IN the early part of this year there passed to his rest and reward the world-renowned scholar and archæologist, Professor A. H. Sayce, to whom Bible students are so deeply indebted. A few years before his death Sayce published an interesting volume of *Reminiscences*. On p. 213 he tells the story of an early disappointment and its result. Dr. Pusey, the Regius Professor of Hebrew at Oxford, died in September, 1882. Sayce anticipated that the vacant chair would become his, since Pusey had assumed that he would be his successor.

The appointment lay with Mr. Gladstone, and Sayce was one of his personal friends. But Gladstone refused to appoint him, considering him "unsafe," as Sayce was then regarded as one of the leaders of German critical theology in the University. Dr. Driver was appointed instead. With what result? Driver remained in a professorial armchair to write critical books, while Sayce went out to the Near East to dig. Like Sir William M. Ramsay, the concrete facts of archæology transformed his thinking, and drove him backwards towards the traditional position. To quote his own words: "I myself had now come (in 1898) to be regarded as a representative of the so-called 'Orthodox' party and a defender of Holy Writ. It was in vain that I protested against being classed as a theologian, and explained that I dealt with the Old Testament simply as an archæologist. Just as the archæological discoveries in the Mediterranean had given a death-blow to the 'critical' theories about Homer and the early traditions of Greece, so similar discoveries were now giving the same death-blow to the theories about the Old Testament and its contents which had been imported from Germany. Subjective fantasies must make way for the solid facts of science which were at last being recovered. . . . With hardly an exception the archæological discoveries of the last thirty-five years in the Nearer East have been dead against the conclusions of the self-appointed critic and on the side of ancient tradition."

The discoveries here referred to by Sayce, made toward the close of the nineteenth century, proved indeed to be but a kind of first-fruits of a bountiful harvest to be reaped in the beginning of the twentieth century. Within the compass of a short essay it is not easy to deal adequately with the wealth of the material available. I propose, therefore, to confine my attention to what might be described as the mountain-peaks of the Biblical history, the historic integrity of which has been assailed by rationalistic criticism but is now vindicated by archæological research. They may be thus summarised: (i) The Cradle of Civilization and Religion; (ii) The Genesis Story of the Flood; (iii) Abraham and the Patriarchal Records; (iv) The Destruction of the Cities of the Plain; (v) The Conquest of Jericho; (vi) The Date of the Exodus; (vii) The Antiquity and Authenticity of the Pentateuch; (viii) The Book of Daniel; (ix) Gezer, Gaza, and Jerusalem; (x) The New Testament: Language and History.

I.—The Cradle of Civilization and Religion.

The first thirty years of the twentieth century have proved to be a period of revolutionary ideas, especially in that which concerns the origin of Civilization and Religion. The change is principally due to the remarkable series of archæological discoveries which marked the opening of the century, and which have been particularly abundant since the termination of the War in 1918, and the opening of Mesopotamia to the work of the excavator. The changes which stand out most conspicuously might be thus summarised :

(1) *The Art of Writing.*—Critics used to assume that the art of writing was not generally practised until about the eighth century B.C. Upon this foundation was based the assumption that the Genesis records of the Bible could be dismissed as mythical or legendary, and that the Pentateuchal narratives in general could not be regarded as historically trustworthy, through lack of a medium other than oral tradition by means of which they could be transmitted. The discovery of the Tel el-Amarna Tablets, in 1888, came as a rude awakening through their revelation of the existence of official correspondence between Egypt and Syria six centuries earlier ; but there was more to follow. The discovery of the Code of Hammurabi revealed the fact that not only was writing practised two thousand years B.C. but that it was so extensively known that a Babylonian official proclamation, containing the laws and statutes of the realm, could be publicly exhibited for the people generally to read. Further, the excavations on the site of Ur of the Chaldees by Dr. Leonard Woolley, during the past ten years, have demonstrated that the art of writing goes back nearly four thousand years B.C.

(2) *The Original Home of Civilization.*—These discoveries on the site of Ur of the Chaldees, together with those under the superintendence of Professor Langdon in the neighbourhood of Kish, near the site of ancient Babylon, have been revolutionary in that they have confirmed the growing belief that not Egypt, as historians once supposed, but Babylonia was the original home of civilization, where, in fact, the Bible precisely locates it. Previous calculations and suppositions have been rudely shaken. To give one simple illustration which should be of interest in this age of unprecedented locomotion. According to the *Encyclopædia Biblica,* " Before fifteen hundred B.C., chariots

and horses were unknown in Egypt." According to the *Cambridge Ancient History*, the chariot first appeared about two thousand B.C. But, as recently as January, 1928, the Americans discovered at Kish two chariot wheels, pre-Sumerian, *i.e.*, of actually 3200 B.C. or earlier. They are wooden discs two feet in diameter, with rims two inches deep, and studded with copper nails on the outer surface. The width between the wheels is 4 ft. 6 in. They were found in two tombs—complete four- and two-wheeled chariots, with the bodies of four wheels and one platform perfect.*

During the past few years Sir Flinders Petrie has been excavating on the site of Old Gaza. Houses of three storeys high, with stuccoed floors, and large square hearths for fires, have been unearthed, together with ancient palaces going back as far as 3000 B.C., containing bathrooms 12 ft. by 8 ft., with underground stone drains. Two subterranean passages, each 500 ft. long, have also been found. The death-pits in the Royal Cemetery of Ur have provided most exquisite examples of artistic skill, dated as early as 3500 B.C. The school-boy of my youth was taught that the arch in architecture was introduced by the Romans. But in Ur of the Chaldees the so-called Roman arch can be seen *in situ* in buildings erected fifteen centuries before the foundations of Rome were laid. Law and literature, manufactures and commerce, domestic and temple architecture in burnt brick, artistry in silver and gold, in cornelian and lapis lazuli, pottery and mosaic and glaze, wheeled transport and stringed instruments of music—all these and more tokens of high culture and advanced civilization have been revealed amid the ruins of the city of Abraham's birth and upbringing. According to Professor Sayce, so early as seventeen hundred and fifty years before Abraham, " there was an excellent postal service connecting Canaan with Babylonia which went back to the days of Naram-Sin, and some of the clay *bullæ* which served as stamps for the official correspondence at that period are now in the Museum of the Louvre."†

One undoubted result of all this has been a growing tendency to treat the early narratives of Genesis with much more respect than was common towards the end of last century. Even the

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* *The Evangelical Quarterly*, April, 1931.

† *The Archæology of the Cuneiform Inscriptions*, p. 143.

story of the Tower of Babel and the consequent dispersion of the race has been illustrated in recent excavations. Archæology has revealed the fact that every important city of ancient Mesopotamia possessed a staged tower or *Ziggurat*. That in Ur of the Chaldees appears to be the best preserved. One which was discovered in 1932 is thus described by Dr. Leonard Woolley: "The other site excavated is the terrace platform of the *Ziggurat*, where we have been digging down to the deeper levels in order to trace the history of the predecessors of the great tower built by Ur-Engur in 2300 B.C. Already we have one series of buildings dating to about 3000 B.C., and a very massive complex of walls and chambers which may well go back nearly a thousand years before that date. It is evident that the present *Ziggurat* is at least the third to occupy the same site."*

The tower was in part a temple, in part a beacon and rallying centre. But the declared purpose of the builders was directly opposed to the explicitly revealed will of God. Decentralization was the divine plan for mankind. God's original command, as recorded in Gen. i, 28, was: "Be fruitful, and multiply, and replenish the earth and subdue it." Congestion and moral contagion are inseparable. Through the wise Providence of God, the race of mankind was distributed geographically and confused linguistically. "So the Lord scattered them abroad from thence upon the face of all the earth: and they left off to build the city. Therefore was the name of it called Babel; because the Lord did there confound the language of all the earth: and from thence did the Lord scatter them abroad upon the face of all the earth" (Gen. xi, 8–9).

"Of the first dispersion of the human race over the surface of the earth," writes Dr. Melvin G. Kyle, "we know almost absolutely nothing aside from the statements of the Bible . . . The second dispersion, however, is being exactly and, as investigation progresses, more and more fully confirmed by the results of archæological research. That from a central point, somewhere in Mesopotamia, the Hamitic branch of the race migrated to the south-west, the Japhetic branch to the north-west, and the Semitic branch 'eastward' toward the 'land of Shinar' is indisputable. As the details of these race movements

* *Daily Telegraph*, February 12, 1932.

emerge from obscurity, the meagre account in Genesis x is not discredited; rather, little by little, it is being confirmed."*

(3) *Monotheism the Primitive Faith.*—It has been too readily assumed and conceded in recent years that there has been an evolutionary development of religion in past ages from Totemism to Polytheism and Polytheism to Monotheism. Much of the critical dislocation of the scriptural records has been based upon this assumption. It was a cardinal principle of Wellhausen's manipulation of the Old Testament. But recent archæological researches tend to drive us back to the traditional conception that God gave to mankind at the first a revelation of His Unity. In his *Semitic Theology* (p. 11), Dr. Langdon, Professor of Assyriology at Oxford, writes: "Although the South Arabians and Accadians are far advanced beyond the primitive Bedouin stage in the periods when the inscriptions begin, their history shows that it is characteristic of the Semites to use animal names in times of advanced culture, when there is no possible influence of primitive totemism. *I therefore reject the totemistic theory absolutely.* Early Canaanitish and Hebrew religions are far beyond primitive totemism (if it ever existed among them) in the period when any definite information can be obtained about them . . . all Semitic tribes appear to have started with a single tribal deity whom they regarded as the Divine Creator of his people." Moreover, as a result of his recent excavations at Kish, Dr. Langdon says: "In my opinion, the history of the oldest religion of man is a rapid decline from Monotheism to extreme Polytheism and widespread belief in evil spirits. It is in a very true sense the history of the fall of man."

Sufficient, I think, has now been presented to justify the belief that we are passing through a period of revolutionary change of ideas which may reasonably induce the hope of a return to a saner outlook upon the story of the beginnings of mankind, and a more reverent regard for the simple but sublime narratives of the early chapters of Genesis. The "primitive savage" and the early cave-man may quite reasonably be found to have existed contemporaneously with other members of the human race in a condition of culture and civilization. The "primitive savage" may prove to be a degenerate. A strong conclusion worthy of careful consideration, is the opinion of the eminent

* *The Deciding Voice of the Monuments*, p. 231.

archæologist, Professor Sayce, which has been endorsed by a leading Canadian scientist, Dr. W. Bell Dawson, F.R.S., in the words: "Neither in Egypt nor in Babylonia has any beginning of civilization been found. As far back as archæology can take us, man is already civilized, building cities and temples, carving hard stone into artistic form, and even employing a system of picture writing; and of Egypt it may be said, the older the country the more perfect it is found to be. The fact is a very remarkable one, in view of modern theories of development, and of the evolution of civilization out of barbarism. Whatever may be the reason, such theories are not borne out by the discoveries of archæology. Instead of the progress we should expect, we find retrogression and decay; where we look for the rude beginnings of art, we find an advanced society and artistic perfection. Is it possible that the Biblical view is right after all, and that civilized man has been civilized from the outset?" *

II.—The Genesis Story of the Flood.

We live in days when scientists are tending towards the abandonment of uniformitarianism. The observed facts in the realm of geology can no longer be reconciled with the doctrine that all things and all forces continue as they were from the beginning. The catastrophic as opposed to the uniformitarian theory of geological transformation has been stoutly maintained by scientists of such eminence as Sir Henry Howorth, Sir J. William Dawson and Professor George F. Wright, of Oberlin, who concludes his article on the subject in the *International Standard Bible Encyclopædia* with the statement: "If we disbelieve in the Bible Deluge it is not because we know too much Geology but too little." It is, however, in the realm of Archæology that the Genesis story of the Flood has been most remarkably vindicated, and that within the past ten years, and from two distinct sources.

The first of these is the quite recent discovery of a chronological prism, catalogued W.B. 444, part of a series of cuneiform tablets purchased in Baghdad by Mr. H. Weld-Blundell for the Ashmolean Museum. The Professor of Assyriology at Oxford, Dr. Stephen Langdon, who was the field director of the expedition which discovered the tablets, writes in his preface to the

* *The Bible Confirmed by Science*, p. 151.

Oxford Edition of Cuneiform Texts concerning W.B. 444: "It constitutes the most important historical document of its kind ever recovered among cuneiform records."

This tablet contains a record of early Babylonian and Sumerian history, written in the reign of King Sinmagir about 2000 B.C. It purports to contain a complete list of Babylonian kings from the beginning of time. Incidentally, as it were, it refers to the Deluge as making a break in the chronological table. It consists of eight columns of cuneiform writing containing 379 lines. It is a plain, unvarnished catalogue of kings and dynasties, capital cities and dynastic changes. The tablet begins thus:

Line (1) Rulership which from heaven descended
(2) At Eridu rulership began
(3) At Eridu Alulim was king

It continues later in the same strain:

Line (19) The rulership was established at Larak
(25) The rulership passed to Sippar

But presently the attention is riveted by the following:

Line (39) The Deluge came up
(40) After the Deluge had come
(41) The rulership which descended from heaven
(42) At Kish there was rulership

Now note the significance of lines (1) and (41). Line (1) records that at the beginning of human history rulership descended from heaven. Then, after the Deluge, the recommencement of the dynasties is described in similar terms: "The rulership which descended from heaven."

Thus in this very ancient record, going back 4,000 years, there is a threefold confirmation of the Genesis story. First, it speaks specifically of the Deluge as having created a break in the succession of kings and dynasties; second, it confirms what Genesis records, that at the beginning God gave to Adam earthly dominion, and that after the judgment of the Flood this was restored in Noah; and third, in the statement "the Deluge came up" we can perceive a confirmation of the Biblical record that "the fountains of the great deep were broken up"—the flood being caused not simply by the rain coming down but also by the waters of the ocean, through some cataclysm occurring in the mighty deep, coming up like a gigantic tidal wave.

This epoch-making discovery by Professor Langdon is paralleled in wonderment by the evidence for the historic Deluge revealed by Dr. Leonard Woolley, in the still more ancient record of the earth itself. Dr. Woolley, as Director of the joint expedition of the British Museum and the University of Pennsylvania, has been engaged during the past seven years on the site of the city whence Abraham originally migrated, Ur of the Chaldees. In the season of 1928–29 he was digging deep down into the debris of that ancient centre of population, until he reached what appeared at first to be the beginning of everything. He writes: "The shafts went deeper, and suddenly the character of the soil changed. Instead of the stratified pottery and rubbish, we were in perfectly clean clay, uniform throughout, the texture of which showed that it had been laid there by water. . . . The clean clay continued without change until it had attained a thickness of a little over eight feet. Then, as suddenly as it had begun, it stopped, and we were once more in layers of rubbish full of stone implements, flint cores from which the implements had been flaked off, and pottery. . . . The great bed of clay marked, if it did not cause, a break in the continuity of history: above it we had the pure Sumerian civilization slowly developing on its own lines; below it there was a mixed culture of which one element was Sumerian and the other of that al-'Ubaid type which seems to have nothing to do with the Sumerians but to belong to the race which inhabited the river-valley before the Sumerians came into it. . . . Inundations are of normal occurrence in Lower Mesopotamia, but no ordinary rising of the rivers would leave behind it anything approaching the bulk of this clay bank; eight feet of sediment imply a very great depth of water, and the flood which deposited it must have been of a magnitude unparalleled in local history. . . . Taking into consideration all the facts, there could be no doubt that the flood of which we had thus found the only possible evidence was the Flood of Sumerian history and legend, the Flood on which is based the story of Noah."*

Dr. Woolley revealed to the world the magnitude of the significance of his discovery in an article in *The Times* of March 16th, 1929, from which the following has been extracted: "As we went deeper the successive strata showed very little change; the types of pottery were uniform, and everything

* *Ur of the Chaldees*, pp. 26–29.

seemed to show that civilization had long been consistent, not to say static; no ware and no shape occurred which was not familiar to us from the graves, though there must have been a gap of centuries at least. At last, when we had got to about the level of the outer plain, the workmen announced virgin soil, a clean, water-laid clay without the slightest admixture of pottery or ash or other human debris; the only object that did come from it was a fragment of fossilized animal bone. That there might be no possible mistake we carried our pit deeper, through eight solid feet of clean clay, and then suddenly came on a flat stratum rich in flint chips and cores, pottery like that found above, and painted fragments of that al-'Ubaid ware which I had last summer rashly labelled as antediluvian! Deeper we went and found more pottery, some of it of the types common in the earliest graves, but with this further examples of painted vessels and sherds of a sort hitherto unknown at Ur, and, at the very bottom, a burnt brick also of a type wholly new to us; this last proves that at the time when the painted pottery and the flints were in use, Ur was not merely a village of mud huts, but already a town civilized and properly built. Then, at a few feet above sea-level, real virgin soil, the clean river silt of the island on which the first huts were built. . . . The disaster which thus buried the old settlement and caused a breach in the continuity of civilization can on the face of it be nothing other than the Flood of Sumerian history and legend. The Sumerians regarded the Flood as an historical event marking an epoch in their national annals, and though they romanced about its date, we have no reason to doubt the fact. . . . He would have been an optimist indeed who had hoped to produce material evidence for such an event as the Flood of Sumerian legend, which is also the Flood of the Book of Genesis; but in no other way can I interpret the facts which our excavations here give us."

That this alluvial deposit was widely extended was proved by a remarkably coincident discovery at Kish close to the site of Babylon, some two hundred miles from Ur of the Chaldees. The following report appeared in *The Times* of March 18th, 1929: "Dr. Stephen Langdon, Professor of Assyriology at Oxford and Director of the Oxford Field Museum Expedition to Kish, yesterday gave hitherto unpublished facts about the results of the expedition, which in Professor Langdon's opinion

afford conclusive evidence that the Genesis story of the Deluge is historical. . . . In a letter to *The Times* on January 4th of this year, Professor Langdon referred to the discovery at Kish of a 'stratum E' in which an alluvial layer has been found, a foot thick, running right through Kish as far as the excavations extend. 'In this layer,' said Professor Langdon yesterday, 'there are two precipitations of clay, potsherds, and stranded fish lying perfectly horizontally. They could not have been placed there by the hand of man, and their position in the layer cannot possibly be explained by any other hypothesis than that of a flood over that part of Mesopotamia. . . . When we made these discoveries two months ago we were loth to believe that we had obtained confirmation of the Deluge of Genesis, but there is no doubt about it now.'"

III.—Abraham and the Patriarchal Records.

The significance of Abraham in the Biblical revelation is indicated by a brilliant expositor of the nineteenth century, Dr. Alexander Maclaren, of Manchester, who described the call of Abraham as "the most important event in the Old Testament." For it must not be forgotten that the Bible is not simply a collection of historical records and divine commandments. It is first and last the record of the divine redemption of mankind. The whole of its structure, from Genesis to Revelation, is built on that foundation. The first eleven chapters of Genesis are really a kind of preface to the great theme which begins in chap. xii. Abraham is thus the first link in a chain of patriarchs, prophets, priests and kings, stretching across the centuries, culminating in Christ in a divine process of human regeneration. But the tendency of criticism has been to regard Abraham as an extremely shadowy figure. Wellhausen denied his existence, regarding him as merely "the free creation of unconscious art." The late Canon Cheyne used to declare dogmatically that no teacher of youth ought to let it be thought that we knew anything whatever of Abraham, Isaac or Jacob. Thus in the minds of many, both clergy and laity, there has grown up the notion that the patriarchal narratives need not be treated as sober history; that it is doubtful whether such a person as Abraham ever existed; that if he did he could only have been an uncultured, Bedouin Sheikh, and a nomad from his birth.

Four archæological discoveries of prime importance have combined to undermine this critical pre-supposition. They are: (i) The discovery of the Code of Hammurabi; (ii) the confirmation of the historicity of Genesis xiv; (iii) the revelations concerning the ancient Hittites; and (iv) the excavations on the site of Ur of the Chaldees.

(1) *The Code of Hammurabi.*—It was in the year 1902—just at the opening of the period covered by this essay—that M. de Morgan discovered amid the ruins of Susa this ancient Code of Laws of Hammurabi, the Semitic founder of the first Babylonian dynasty. His date may roughly be assigned as 2100 B.C. The code of laws which bears his name is very comprehensive, dealing minutely with practically every department of life, even to the punishment of the surgeon who has killed his patient while operating upon him! So long a time has elapsed since this discovery was made that it is hardly necessary to go into detail. Suffice it to say that it revealed the fact that the art of writing was extensively known 2000 years B.C.; and second, that a code of laws was then in operation of a character which betokened a high order of civilization. All this was destructive of some of the first principles of the Higher Criticism.

It is easy to lose sight of the fact that the time which separated Abraham from Moses was a period equal to that which separates the Norman Conquest from the accession of Queen Elizabeth. Abraham's acts, therefore, must not be judged by the standard of the Mosaic Law; for that was not given until half a millennium later. But certain of the patriarch's doings, as recorded in Genesis, are easily explainable in the light of the Babylonian customs revealed in the Code of Hammurabi; *e.g.*, his acceptance of Hagar at the hands of Sarah, and his culpability in her ultimate ejection from his home. For the Code (law 146) says: "If a man has espoused a votary, and she has given a maid to her husband and she has borne children, afterwards, that maid has made herself equal with her mistress, because she has borne children her mistress shall not sell her for money, she shall put a mark upon her and count her among the maidservants."

(2) *The Confirmation of the Historicity of Gen. xiv.*—The story of the battle of four kings against five, in which Abraham participated, was regarded by many as incredible. Professor Nöldeke, in 1869, published a treatise on "The Unhistorical Character of the Fourteenth Chapter of Genesis." The names of the

kings referred to were unknown outside the Bible. But thanks largely to the researches of Mr. George Smith and Dr. Theophilus Pinches, both of the British Museum, the historical character of the narrative has been substantially confirmed. Competent Assyriologists accept its historicity. Amraphel is Hammurabi. Few kings of the ancient world are now better known. In addition to the Code, about ninety of his letters and other documents have been discovered and translated. The proof of the identification of other names in the narrative is given very conclusively by Sayce in his *Monument Facts and Higher Critical Fancies* (2nd Edn.), published in 1904.

(3) *The Revelations of the Ancient Hittites.*—The present century has witnessed a great increase in our knowledge of the ancient empire of the Hittites and the extensive ramifications of this powerful race. It is hard to believe that in the middle of the nineteenth century distinguished Christian scholars denied the very existence of the Hittites. It was in 1839 that the existence of inscriptions at Boghaz-Keui, in Cappadocia, was first revealed, but half a century elapsed before they could be interpreted. In 1907, Dr. Winckler found there several thousands of cuneiform inscriptions in the Hittite language. Word-lists with the meaning in Assyrian also came to light. Ten years later Professor Hrozny, of the University of Prague, gave to the world his decipherment and translation of the Hittite Code of Laws.

We now know that the Hittite empire was both powerful and cultured; frequently at war with Egypt. According to Sayce, the wars between the two empires on the battle-ground of Palestine had so exhausted the country that the way for the Israelitish conquest of Canaan was prepared by the Hittites. The purchase of the cave of Machpelah by Abraham, and the other references to his contact with the Hittite race may thus be regarded as absolutely historical, anticipating as they do, by thousands of years, the discoveries of modern Archæology.

(4) *The Excavations on the site of Ur of the Chaldees.*—For their testimony to the historicity of the patriarchal narrative these have been both illuminating and convincing. For it was while Abraham was a resident in this city that he received his call. Dr. Woolley's investigations have revealed an environment which exactly corresponds. Ur of the Chaldees was a civilized and cultured city, with its schools, libraries, temples and commodious

dwellings. But its principal temple was devoted to the worship of the Moon-god. Doubtless the moral life of the community suffered from the corruption which is inseparable from idolatry. Abraham was divinely summoned to leave the city and become a wanderer. He left Ur and ultimately reached Palestine. The writer of the Epistle to the Hebrews says: "By faith he sojourned in the land of promise as in a strange country, dwelling in tents with Isaac and Jacob, the heirs with him of the same promise." * Note the emphasis on "dwelling in tents." A Bedouin sheikh does not require faith to dwell in a tent; but Abraham, being a city-dweller from his birth, did require faith in order to step out from his old associations and former manner of life. But, while a wanderer, he was looking forward to the life of a citizen; for the vision that sustained him was that of a "city which hath foundations, whose builder and maker is God." Such harmony between the Old Testament and the New, with its confirmation by modern Archæology, is a sure indication of the historical character of the narrative.

IV.—The Destruction of the Cities of the Plain.

Next to the judgment of the Flood in the days of Noah the most signal act of divine punishment of the ungodly recorded in the Old Testament is that of the destruction of the Cities of the Plain. Our Divine Lord placed the seal of His imprimatur upon its historical character in words of condemnation of the unbelieving cities which bordered the Sea of Galilee. "And thou, Capernaum, which art exalted unto heaven, shalt be brought down to hell: for if the mighty works, which have been done in thee, had been done in Sodom, it would have remained until this day" (Matt. xi, 23).

The only written record of this dire event is that which is contained in the Old Testament. The story is brief but graphic and awesome. Smoke, and fire, and sulphur, and salt are the elements which combined in the work of destruction. A scene of complete desolation is presented in the words: "Then the Lord rained upon Sodom and upon Gomorrah brimstone and fire from the Lord out of heaven; And he overthrew those cities, and all the plain, and all the inhabitants of the cities, and that which grew upon the ground" (Gen. xix, 24, 25). An arresting

* *Heb.* xi, 9.

feature in the narrative is thus related: "But Lot's wife looked back from behind him and she became a pillar of salt."

Now this is one of the Biblical records the truth of which has been severely challenged. But the story, down to some of its minutest details, has been remarkably corroborated by a scientific expedition which investigated the whole area about ten years ago. The party was a representative one. The President was Dr. Melvin Grove Kyle, a Presbyterian, of the Xenia Theological Seminary, Missouri, U.S.A. It included Dr. Albright, a Methodist, of the American School of Oriental Research at Jerusalem, and Mr. Makhouli, of the Department of Antiquities, a member of the Greek Catholic Church in Palestine. The leading archæologist was Père Mallon, a Jesuit priest of Jerusalem; the geologist was Professor Alfred Day, of Beirut College in Syria. Besides several scholarly assistants, the expedition had the advice of Mr. Dinsmore, of Jerusalem, reputed the most expert botanist in Palestine, and the judgment of Père Vincent, the foremost Palestinian scholar in the world.

The results of the expedition may be summarized as follows:

(1) *The Biblical Presentation of a Formerly Populated and Civilized Region is Confirmed.*—The evidence was revealed to Père Mallon in a group of graves at Bab-ed-Dra'a, 500 feet above the Dead Sea. Dr. Kyle writes: "The civilization represented in the Bible story, that of the early Bronze Age, 2500–1800 B.C., the civilization of Abraham and Lot and of Sodom and Gomorrah, was clearly established, by indubitable evidence, to have been on the Plain at that time. The High Place at Bab-ed-Dra'a with its seven pillars together with its adjoining cemetery manifestly for important personages was of this early Canaanite civilization, positively identified as belonging to that period by the pottery from the graves" (*The Deciding Voice of the Monuments*, p. 253).

(2) *The Location of the Cities is thus Indicated.*—"The rising of the Dead Sea since the days of Abraham by reason of the filling in the delta of the Jordan at the north end of the sea, has resulted, especially since the beginning of the Christian era, in the sea running over at the southern edge and flooding the Plain. There, in a few feet of water and mud, the ruined cities hide their shame. The High Place and the Cemetery of their noble dead being upon higher ground is still to be seen" (p. 255).

(3) *The Original Beauty and Fertility of the District*—"like

a garden of the Lord "—is corroborated by Dr. Kyle, who was impressed by its salubrious climate, its excellent water from the red sandstone of Moab, its romantic scenery, and its possibility of becoming one of the finest winter resorts in the world.

(4) *After the Catastrophe a Vast Period of Desolation Ensued.*—" The most careful search of the Plain from one end to the other, with soundings down to virgin sand and gravel, especially at Arabic Zoar, showed that from the end of the Early Bronze Age, about 1800 B.C., on to the end of the Biblical period, in fact till Byzantine times, there was no civilization of any kind on the Plain " (p. 254).

(5) *The Elements of Destruction were undoubtedly such as the Scripture represents.*—In a monograph entitled *Explorations at Sodom*, Dr. Kyle says that " the great catastrophe did take place exactly as narrated in the Bible . . . This region was found by the geologists to be a burned-out region of oil and asphalt, of which material, indeed, there is again an accumulation that will soon be exploited . . . Now wherever these conditions exist there is an accumulation of gases, and the geologists tell us that here, at some time which they cannot exactly fix, these gases were ignited by some means, also to them unknown, and there was a great explosion, with first an upheaval, and then a subsidence of the strata. The character of the ruptured strata has also been determined, with most interesting conclusions. There is along the lower part of this Plain a great stratum of rock-salt, which on the western side of the Plain shows itself in that great salt mountain, now known as Jebel Usdum. At its base is a stratum of rock-salt about one hundred and fifty feet thick. It is almost pure salt, but lies in layers of varying thickness. Mixed with the layers of salt, and falling down over them also, is a marl in which is much free sulphur, lumps of which we picked up along the sea. When the explosion of the gases took place, this stratum of salt mixed with sulphur was ruptured with the other strata, and the salt and sulphur carried up into the heavens red-hot, and so rained down upon Sodom and Gomorrah and over the whole region, exactly as the Scripture describes the rain of fire and brimstone from heaven. Mixed with the salt and sulphur was also the asphalt, heated to a high degree " (pp. 127–130). The boiling asphalt would create a dense smoke screen; such as that which is described in the Scriptural narrative in the words: " And Abraham looked

towards Sodom and Gomorrah and toward all the land of the Plain, and beheld, and, lo, the smoke of the country went up as the smoke of a furnace."

(6) *The possibility of such a fate as that which befell Lot's wife* is illustrated by the fact that to this day the mountain peaks of the neighbourhood are incrusted with salt. Thus, in the words of Dr. Kyle, "the geologists have found in nature exactly what the Biblical record describes in Providence."

V.—The Conquest of Jericho.

The Scriptural narrative of the capture of Jericho seldom fails to provoke the derision of the sceptic. The details of the conquest are certainly extraordinary; but assuming the possibility of Divine intervention in the affairs of mankind, they are far more illuminating than the superficial reader could imagine. Jericho was a walled city apparently impregnable; "shut up" as the narrative describes; but a city which was the door of entrance into the Land of Promise, and therefore one which had to be occupied. A mysterious, angelic visitor appeared to Joshua with a drawn sword in his hand! That fact alone suggests that no ordinary event is at hand. Precise instructions are given. The military forces are to march around the city once every day, followed by trumpeters and priests bearing the Ark of the Covenant; with the rest of the people following in the rear. On the seventh day the whole company is to march around seven times; and the promise is given that at the sound of the trumpets, when the people are to shout with a great shout, the wall of the city will fall down "flat." A breach being made, the military are to enter, and the city is to be destroyed.

This Scriptural story has received most remarkable confirmation in an expedition of quite recent date, due to the enterprise of Sir Charles Marston, supported by the late Lord Melchett. The work of exploration was begun in 1930, and has continued in the three succeeding years. Professor John Garstang, of the University of Liverpool, was in charge of the expedition. In a volume entitled *The Foundations of Bible History—Joshua Judges*, he has presented a careful and considered report of the work of excavation.

To illustrate the archæological confirmation in detail of the Bible story, the following points are noteworthy:

(1) *The Size of the City.*—A command to walk around ancient Babylon or Nineveh, even once in a day, might well have provoked sceptical derision. But Jericho was an exceedingly small city, being, according to Professor Garstang, "rather less than 230 yards in length and about 130 yards in width, so that its whole circumference was not more than 650 yards. Its area was thus less than six acres, and the population it contained could hardly have numbered more than 1,500 people"—(p. 131). With a circumference of considerably less than a mile it was thus not difficult for the army of Israel to encompass the city as instructed.

(2) *The Walls of the City.*—According to the A.V., the wall of Jericho fell down "flat." The Hebrew word is תַּחְתֶּיהָ, which the R.V.M. renders "in its place." A collapse is described of sufficient dimensions to enable the besieging army to enter and capture the city. The recent excavations reveal the fact that Jericho was surrounded by two parallel walls of thirty feet in height—the outer one six feet, the inner one twelve feet in thickness. They were built of sun-dried bricks containing no binding straw. Sir Charles Marston has suggested that "jerry built" is possibly derived from "Jericho built!" Careful examination of the debris has demonstrated that the walls fell outwards. Professor Garstang writes: "The outer wall suffered most, its remains falling down the slope. The inner wall is preserved only where it abuts upon the citadel, or tower, to a height of eighteen feet; elsewhere it is found largely to have fallen, together with the remains of buildings upon it, into the space between the walls which was filled with ruins and debris. Houses alongside the wall are found burned to the ground, their roofs fallen upon the domestic pottery within. As to the main fact, then, there remains no doubt; the walls fell outwards so completely that the attackers would be able to clamber up and over the ruins into the city" (pp. 145–146).

(3) *The Cause of the Collapse.*—Professor Garstang suggests that the collapse of the walls may have been due to earthquake. He writes: "The collapse of the walls of Jericho is not attributed by the Bible narrative to a physical agency. But we should not overlook in this connexion the possible effect of earthquakes, which in themselves would doubtless have been regarded at the time as direct manifestations of Jehovah's powers. . . . Palestine is subject to earthquakes, some of which have wrought great damage. The havoc caused by the earthquakes of 1927 amounted

to a national disaster. At Nablus, two whole streets of houses completely disappeared, and in all several hundred houses fell, leaving thousands of people homeless. At Amman also the shocks caused much material damage; while at Jericho itself an hotel collapsed with fatal consequences, and the ends of the Allenby bridge over the Jordan were displaced. Jericho lies particularly within the earthquake zone, and on that occasion violent shocks were recorded on four days out of seven" (pp. 143–144). "Further investigations at Jericho in the spring of 1931 disclose the possible effects of earthquake shock affecting the northern and southern walls. The eastern wall is entirely destroyed. These observations indicate tremors east and west across the Rift, as was apparently the case in the earthquakes of 1927–28" (p. 404).

Whether all this may be regarded as evidence of divine intervention each must determine for himself. I personally am convinced that it may. When crossing a bridge, a modern army is always commanded to "break step"; the reason being that the swinging movement of an immense body of men, marching in step, is calculated to weaken the bridge and bring about its downfall. It is surely a reasonable suggestion that the tramp of an immense multitude seven times around the city, with the immense vibration of a great shout, synchronizing with a gigantic earth tremor divinely foreseen, may have combined together to bring about the collapse of the brick walls of Jericho.

(4) *The Date of the Capture.*—Some eighty Egyptian scarabs unearthed, containing the cartouche of the reigning Pharaoh of Egypt, together with an immense quantity of pottery discovered, indicate a date for the capture of Jericho of about 1400 B.C. I shall refer to this later. Suffice it to say here that these discoveries tend to harmonize the narrative with the Scriptural records which both precede and follow.

(5) *The Evidence of Fire.*—In the Biblical story we read (Josh. vi, 17, 21, 24): "And the city shall be devoted, even it. and all that are therein, to the Lord." "And they utterly destroyed all that was in the city." "And they burnt the city with fire, and all that was therein." Sir Charles Marston has said that Professor Garstang was so impressed with the extent of the conflagration and the thickness of the burnt strata enveloping the ruins that he came to the conclusion that Joshua

and his men, after the capture, systematically collected wood and other combustible material from all round the district to make one huge bonfire of the devoted city." (*The New Knowledge about the Old Testament*, p. 114.) To quote the Professor's own words: "Every room in the palace area tells the same tale of walls half fallen, reddened by fire amid layers of white ashes and masses of charcoal, rising through and above the ruins. The store rooms were filled with great pottery vessels ranged in rows, and, though now crushed to fragments and their contents burnt, some of them may be seen to have been filled with grain and other foodstuffs, while some were sealed up and still show the dregs of their once fluid contents."

(6) *The Absence of Metal.*—One striking feature of the excavations is the fact that though abundance of pottery has been collected, so far no vessels of bronze or other metal have been unearthed. This is the more extraordinary in view of the fact that while quantities of burnt wheat, lentils, onions, and other foodstuffs have been discovered, no metal vessels have yet been seen. The omission, however, is fully accounted for when we turn to the Scriptural narrative which contains the plain statement: "And they burnt the city with fire, and all that was therein: only the silver, and the gold, and the vessels of brass and of iron, they put into the treasury of the house of the Lord." This detail, taken in conjunction with all else that has been revealed, confirms the precise accuracy of the Scriptural record, and justifies the verdict given by Professor Garstang in the words: "Set side by side with the Biblical narrative, the material evidence is seen to bear out in every essential detail the record of the capture and destruction of Jericho by the Israelites under Joshua."

VI.—The Date of the Exodus.

The generally accepted date of the Exodus in critical circles in recent years has been about 1220 B.C. This assumption has been fruitful in considerable dislocation of the Scriptural writings, viewed from the traditional standpoint. One serious result of the assumption is the belief held by some that the great mass of the Israelites never even entered Egypt. Moreover, it has led to considerable confusion and contradiction of the sacred narratives, casting discredit upon the authenticity of the books of the Hexateuch. But one of the by-products of

the excavations on the site of ancient Jericho has been the discovery of material evidence in support of the traditional date of the Exodus, and one which is in harmony with the chronological data of the First Book of the Kings. There we read in chap. vi, 1: "And it came to pass, in the four hundred and eightieth year after the children of Israel were come out of the land of Egypt, in the fourth year of Solomon's reign over Israel, in the month Zif, which is the second month, that he began to build the house of the Lord."

Now we know with some assurance the date of the accession of Solomon. According to *The Cambridge Ancient History*, it was in 970 B.C.; according to Sir Flinders Petrie 960 B.C. If we divide the interval between these dates we arrive at about 965 B.C. for the time of the foundation of the Temple. The date according to Josephus was 966 B.C. If we accept the latter date as the basis of our calculation, and add 480 years thereto, we arrive at 1446 B.C. as the date of the Exodus; and, allowing a round figure of 40 years for the wilderness wanderings, we get 1406 B.C. as the date of the capture of Jericho.

The recent excavations on the site of Jericho confirm, in a remarkable degree, this Biblical chronology. Professor Garstang has been at considerable pains, while investigating the various articles unearthed, to attain to chronological exactitude. "The date of this destruction," he says, "was not ascertained, but certain limits were established. Among the thousands of potsherds characteristic of the period, found among and below the ruins, not one piece of Mykenæan ware has been observed. This fact suggests that the fourteenth century had not begun at the time the walls fell. A more precise indication was found outside the city, at the foot of its northern slope, in an undisturbed stratum that overlay the filled-up fosse of the Middle Bronze Age. The destruction of the Canaanite city is well marked by black layers of burnt matter running down from the ruined parapet of the outer wall. In this area, uniquely, a few houses sprang up, outside and upon the disused fortifications, after the destruction of the upper city, in the second half of the Late Bronze Age, to be destroyed in their turn, leaving a second layer of ashes as witness of the fact. Between the two layers of burnt matter, and underlying in particular the latter, there was found in the course of excavation a vase of Mykenæan style, the date of which may be assigned with some certainty to about

1300 B.C. It pertains, as the evidence shows, to a partial re-occupation of the northern extremity of the site, outside the former limits of the upper city and above the debris that marks its fall. It follows that the upper city had already been reduced to ruins before that date. The evidence all points, then, towards the year 1400 B.C. for the fall of Jericho" (pp. 146–147).

In the meantime much confirmatory evidence has come to light. More recent excavations have yielded vast hordes of pottery of the middle of the late Bronze Age (1400 B.C.). Especially in the necropolis of the ancient city, where the inhabitants of Jericho through many generations had been interred, valuable chronological witnesses came to light. Among these were some eighty scarabs, inscribed with the royal cartouche of the reigning Pharaohs of the 18th Dynasty. "In one was found scarabs bearing the joint names of Queen Hatshepsut and Thotmes III (1501–1487 B.C.) and in another two royal seals of Amenhetep III (1413–1377 B.C.). As these all come to an end with the two royal seals of Amenhetep III, there is evidence, quite independent of the pottery, that the city also ceased to exist during that period. For the two centuries that followed there were no interments, the distinctive pottery and decoration of the time of Akhenaten and Tutankhamen was not represented at all. Thus everything pointed to the reign of Amenhetep III (1413–1377 B.C.) as marking the period when Jericho fell." (Marston: *The New Knowledge*, etc., pp. 96–97.)

VII.—The Antiquity and Authenticity of the Pentateuch.

Did the first five books of the Bible originate at the time at which, according to their own testimony, they did originate, or are they the product of an age many centuries later? The *prima facie* testimony of the books themselves gives the impression that they are practically contemporaneous documents of the events related. Such is the traditional belief of the Christian Church. The Higher Criticism of the last half century, however, especially that presentation of it associated with the names of Graf and Wellhausen, is strongly opposed to this traditional belief.

The critical theory has been built up mainly on the following hypothetical supports: (i) the late date of the art of writing; (ii) the gradual evolution of religion from totemism to poly-

theism, and from polytheism to monotheism; (iii) the belief that such a code of laws as that presumably given through Moses could not, by reason of its religious and ethical superiority, have been produced at such an early period; (iv) that the events described during Israel's sojourn in Egypt in the days of Joseph, and the Exodus in the time of Moses, are not historically trustworthy, being the work of later authors who had very little knowledge of Egypt and matters Egyptian; (v) that the ritual observances prescribed in the Book of Leviticus are far too advanced to have been the product of the Mosaic Age, and must be ascribed to a period subsequent to the Babylonian captivity—say a thousand years later than the date of their origin according to the records of the Pentateuch.

Now in refutation of these imaginary hypotheses—for that is what they strictly amount to—we have already considered the evidence which disposes of (i) the alleged late date of the art of writing; and (ii) the gradual evolution of religion from totemism to monotheism. With respect to the remaining three, the evidence towards their refutation that has most recently come to light may be classified under four geographical heads, viz.: (i) The evidence from the site of ancient Jericho; (ii) the evidence from the Temple of Serabit in the Sinaitic desert; (iii) the evidence of the Ras Shamra tablets discovered in Syria; (iv) the evidence from the monumental remains of Ancient Egypt as recently presented by Professor Yahuda.

(1) *The Evidence from the Site of Jericho.*—It has been customary in critical discussions to group together the first six books of the Bible under the name of the Hexateuch. With respect to the historical accuracy of these writings, we have striking testimony from Professor Garstang as a result of his recent researches. Not only Jericho, but also the sites of Ai and Hazor and other places in Palestine, were carefully investigated. And it is with respect to the precise Biblical descriptions of these ancient cities, and the fate that befell them, that Professor Garstang is moved to utter a strong protest against the critical assumption that the records were not contemporaneous, but the product of a time several centuries later than the date of the events related. He says: "In view of the remarkable accuracy and fullness of topographical detail in the earlier portion of the Book of Joshua, and the parallelism of certain passages in the Book of Judges with contemporary Egyptian archives, it is

difficult to believe that these records were not written down in any form until the ninth or eighth century B.C., to which period the early documents, J. and E., are attributed, that is from 300 to 500 years after the events described. . . . It would seem indeed probable that the religious leaders of Israel, soon after their entry into Canaan, adopted the system of writing already well developed in the land, and commenced at any rate a series of sacred archives. . . . Remarkable as may appear the proved historical reliability of the documents upon which is based the world's oldest connected narrative in the history of human and national endeavour, the conclusion we have reached is not altogether astonishing in view of the fact that both the Egyptians and the Hittites, whose influence permeated Canaan at that time, had already established a system of State archives" (pp. 341–342).

(2) *The Evidence from the Temple of Serabit.*—Although not recent, this store of archæological evidence lies within the prescribed period of this essay. For it was in the year 1905 that the veteran archæologist, Sir Flinders Petrie, conducted an expedition in the Sinaitic desert which resulted in the exploration of an ancient shrine called the Temple of Serabit. The temple is situated in the neighbourhood of the famous turquoise mines in which the sovereign rulers of Egypt had from remote centuries been interested; and it is practically certain that the workers in the mines were worshippers in the temple. A remarkable feature that came to light during the exploration was that the mode of worship in Serabit was a form of ritual entirely distinct from that practised in Egypt, but one which largely corresponded to Semitic religious observances. The following are some of the conspicuous points of contrast and agreement:

(i) Serabit is a temple built on a hill. High Places were unknown in Egypt; but we need only recall the scene of Elijah's test sacrifice on Carmel, or the familiar story of Abraham's offering of his son Isaac on the mountainous heights of Moriah, to recognize the correspondence with what obtained in this Sinaitic place of worship.

(ii) Small stone incense altars were found in Serabit. The Egyptians burned incense in a metal shovel; whereas the similarity of Hebrew worship is revealed in the account given in Exod. xxx, 1: "And thou shalt make an altar to burn incense upon."

(iii) Four large layers or tanks, evidently erected for the purpose

of ablutions, were found—another feature corresponding to the ceremonial washings prescribed in the Tabernacle worship of the Hebrews.

(iv) Immense heaps of ashes which remain testify to the fact that the worship was associated with the offering of burnt sacrifices.

One of the most amazing discoveries was that the men who worked the mines and worshipped in the temple were actually possessed of a system of alphabetical writing. The form of the characters bears a resemblance to the Egyptian hieroglyphics on the one hand, and the later Phœnician and Hebrew scripts on the other. The date of the writing is calculated to be about 1500 B.C. The question naturally arises: who were these worshippers? Sir Flinders Petrie has suggested that they were Hebrews, and that the "three days' journey into the wilderness" in the demand of Moses to Pharaoh, was the common phrase used in Egypt for going down to Sinai. Whether the Hebrews actually worshipped in the shrine of Serabit cannot be certainly demonstrated. But the fact remains that fifteen centuries B.C. a system of worship very similar to that prescribed in the Pentateuch was regularly practised in the Sinaitic temple. Moreover, the presence of alphabetical writing is proof that such a system of religion could have been carefully written down and described in detail as it is in the Books of Moses. This twin fact shakes the very foundation of the Higher Critical contention.

(3) *The Evidence of the Ras Shamra Tablets.*—The testimony from Serabit has been illuminated and confirmed by one of the most recent and one of the most interesting archæological finds in the period under review. Ras Shamra is situate on the coast of Syria, opposite the island of Cyprus. There three years ago, a peasant while ploughing unearthed a tablet containing a cuneiform script. On this discovery being reported further search was made, with the result that a considerable collection of similar tablets was unearthed. The inscriptions are found in an alphabetical language in cuneiform characters, which could not be deciphered at the time of their discovery. But the contents have since been revealed through the co-operation of three distinguished scholars: Hans Bauer, of Halle; Edouard Dhorme, of Jerusalem; and Charles Virolleaud, of Paris. They proved to contain a primitive Semitic dialect resembling Hebrew. The date is about 1400 B.C.

A striking feature of these tablets is the marked resemblance of their contents to the religious ideas and ceremonies in the Mosaic teaching and ritual of the Pentateuch. Some of these may be thus summarized :—

(i) The Name of the Deity is El, with the plural form Elohim. This is the generic name for God throughout the Old Testament. But El, or Elohim, reveals Himself in the Pentateuch as Jehovah or Jah (which may be spelled Yah)—the same name in an abbreviated form. This name Yah is also found in the Ras Shamra inscriptions.

(ii) The Sacrifices. The tablets contain references to the Trespass Offering, the Peace Offering, the Whole Burnt Offering, the First-Fruits, and other familiar ordinances of the Mosaic ritual.

(iii) The Sacred Places. The innermost part of the shrine is called " the holy place of the holy places."

(iv) The Priest in the Ras Shamra ritual is called Kohen, which is the identical name for a Hebrew priest.

(v) The sacred number " seven " occurs quite frequently in the inscriptions.

(vi) The religious ideas correspond.

Now although unearthed in Syria, it has been revealed that these inscriptions reflect a worship and civilization which ultimately proceeded from the far south of Palestine and the district of Sinai. In a very interesting article which he communicated to the London *Daily Telegraph*, which appeared in the issue of November 22nd, 1933, Sir Charles Marston says : " To a young English scholar, Mr. Theodor Gaster, is due the credit of reading the full riddle of the new texts. He has been able to show, on cultural and linguistic grounds, that, though found in the north of Syria, the texts really reflect a civilization which had come thither from the extreme south of Palestine and the district round Sinai. Their marked agreement with the Pentateuch on numerous points of ritual and cult is a remarkable—one might almost say a sensational—vindication of the Hebrew tradition that the Law of Moses was first promulgated in that area."

(4) *The Testimony of Egyptology as recently presented by Professor Yahuda.*—The evidence of the traditional time and place of origin of the Mosaic writings which has proceeded from Serabit and Ras Shamra has been reinforced quite recently by the philological researches of Dr. A. S. Yahuda, formerly

Professor of Mediæval Hebrew Literature in the University of Madrid. In the early part of 1933 he published the first volume of what may easily prove to be an epoch-making work, *The Language of the Pentateuch in its Relation to Egyptian.*

The critical view used to be that very little was to be obtained from Egypt and Egyptian for the elucidation of the Old Testament. Professor Yahuda, however, has been deeply impressed with the Egyptian environment which is reflected in the Joseph and Exodus writings. In his preface he says: "After having studied all the languages with which Hebrew had any relation, I came to the conclusion that Egyptian had exerted considerable influence on the formation and development of Hebrew as a literary language." He has accordingly made it his principal aim to establish the Hebrew-Egyptian relationship of the Pentateuch.

The method adopted by the Professor demands a wealth of scholarship, particularly of Hebrew and Egyptian, which is extremely rare, but the principle is simple. It might be thus illustrated. If one thousand years hence a German book should be discovered containing the words cricket, golf, football, printed in German characters as though they were German words, the finder, provided he were well versed in British customs of to-day, would be able to draw certain definite conclusions as to the influence exercised upon the author thereby. Dr. Yahuda finds in these Pentateuchal narratives such an abundance of Egyptian ideas and expressions as to warrant the belief that Egypt was the cradle of Hebrew thought, and that the wealth of detail exhibited could only have been derived from first-hand knowledge and exact observation at close quarters. Three examples may suffice for our present purpose:

(i) The passage in Gen. xli, 40: "According to thy word shall all my people be ruled," used to present great difficulty to commentators, as the literal rendering of the Hebrew is "shall all my people *kiss*" (יִשַּׁק). The R.V.M. renders "order themselves" or "do homage." Now the context has to do with the distribution of food during the coming years of famine. On comparison with the Egyptian the difficulty disappears. In polite speech the Egyptians always spoke of "kissing" their food. The meaning of Pharaoh's command, therefore, is that in the coming years the feeding of the people shall be regulated by the orders of Joseph the Prime Minister.

(ii) In Gen. xliii, 16, Joseph's steward is called אֲשֶׁר עַל הַבַּיִת "he over the house," which was a specific official designation common in Egyptian administration—the title for the administrative officer of a king or dignitary.

(iii) At the beginning of his conversation with Joseph, Pharaoh says (Gen. xli, 15): "I have heard say of thee that thou canst understand a dream to interpret it." The Hebrew word translated "understand" is שָׁמַע, which means "to hear." But this is in entire correspondence with the signification and use of the Egyptian word for "hear."

The above are but a few out of a multitude of examples which illustrate the Egyptian environment of the Pentateuchal narratives, and which has led Professor Yahuda to a conclusion quite at variance with that of the critics. In a lecture given in January, 1933, before the Victoria Institute in London, he said: "It has been my aim to show that the treatment applied to the Bible, regarded as a complex of suspicious documents which can only be trusted when outside evidence is forthcoming, and even then only to such an extent as is in harmony with the tendencies of Higher Criticism, must be abandoned, since every discovery of ancient monuments, and every new find of old records has gone to confirm the Biblical statements." To this may be added the testimony of another equally distinguished Egyptologist, the late Professor Naville, of Geneva, who said in the preface of his book, *Archæology of the Old Testament*: "The new line I have taken has brought me back to the old traditional view about the authorship of several books of Scripture. . . . It is not through any 'dogmatic environment,' but from a sincere conviction based on facts, that I joined the 'contemptible minority' which still believes in the Mosaic authorship of the Pentateuch."

To conclude, the collapse of the Higher Critical theory of the origin of the Pentateuch is imminent. Harold M. Wiener, Wilhelm Möller, Martin Kegel, and Dr. Hertz, Chief Rabbi in London, are among the modern writers who have strongly opposed it. Dr. Albright, Director of the American School of Oriental Research in Jerusalem, has said that "practically all of the Old Testament scholars of standing in Europe and America held these or similar views until very recently. Now, however, the situation is changing with the greatest rapidity, since the

theory of Wellhausen will not bear the test of archæological examination."*

VIII.—The Book of Daniel.

During the past decade there has been witnessed a very decided reaction in the conservative direction in the realm of scholarship in reference to the historicity of the Book of Daniel. This change has been due to the compulsion of archæology. Previously, in critical circles, the book was regarded as substantially a piece of religious fiction of little historic worth. A very revealing admission, however, appears in the *International Critical Commentary on Daniel*, which was published in 1927. Dr. J. A. Montgomery says in his Introduction (p. 58): "While the majority of philological commentaries and standard articles upon the book now accept the late date for its origin, nevertheless this tendency may not arrogate to itself the whole of scholarship, as there still remain excellent modern scholars who vigorously defend the traditional position."

The weakness of the Higher Critical position is due to the concrete facts of archæology, which can no longer be disregarded, which reveal:

(i) The collapse of the critical argument associated with the names of Greek musical instruments which occur in the text of Daniel. In his scholarly and comprehensive book entitled *In and Around the Book of Daniel*, the Rev. Charles Boutflower illustrates the wealth of Greek influence on the times in which the book was written. Nebuchadnezzar drew Greek mercenaries from Ionia to fill his armies and to cut his medallions and gems. It should not be surprising, therefore, to find the names of Greek musical instruments in the story in Daniel of what occurred in his reign.

(ii) The revelations concerning Belshazzar, whose very existence the critics once denied. In 1929 appeared another weighty volume, from the pen of Dr. Dougherty, entitled *Nabonidus and Belshazzar*. "In this work he places side by side all the material available for arriving at the original date. First comes the Nabonidus Chronicle, next the Cyrus Cylinder, thirdly, the *Persian Verse Account of Nabonidus* in cuneiform, and all three written at the time or soon after the siege of Babylon by Cyrus in 538 B.C. Then comes Herodotus writing about 400 B.C., followed

* *The Archæology of Palestine and the Bible*, 1932.

by Xenophon about the year 360 B.C., followed by the Græco-Babylonian Berossus, a priest of the temple of Bel, who wrote about 250 B.C. Now if Daniel were written at a later date still, how is it that his narrative is correct in details which the other authors living so much nearer the times ignore ? For example, not one of them names Belshazzar. Nor is the historical setting so accurate as that given by the author of Daniel. Whereas, on the other hand, the Book of Daniel by its genuine local accuracy corrects or explains the others. Thus Belshazzar seems to have been the King of Babylonia *de facto*, while his father, Nabonidus, was King of Babylon *de jure*—his father having entrusted to him the 'kingship' (sarrutam) at an early stage in his public career. . . . Moreover, through his father's marriage into the house of Nebuchadnezzar, Belshazzar seems to have been able to claim Nebuchadnezzar as his 'grandfather'—a word for which there is no nearer title in Hebrew or Aramaic than 'father'."*

(iii) The Undesigned Coincidence revealed in the promise made to Daniel as recorded in chap. v, 16: "If thou canst read the writing, and make known to me the interpretation thereof, thou shalt be clothed with scarlet, and have a chain of gold about thy neck and shalt be the third ruler in the kingdom." Until Sir Henry Rawlinson dug up, in 1849, the first cuneiform tablet containing the name Belshazzar, no one could explain why the *third* position in the kingdom should be included in the reward. Now, with all the light of archæology available, we understand. Although Belshazzar was the acting king, resident in the capitol, his father was still king *de jure*. Consequently, when bestowing the highest reward in his power he could only make Daniel the third, as he himself was but the second ruler in the kingdom. This is evidence of the highest order of the historic truth of the narrative.

IX.—Gezer, Gaza, and Jerusalem.

Only brief references can be made to the work of exploration which has proceeded on these sites during the period embraced by this essay.

(1) *Gezer*, which lies about seventeen miles south-east of

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* *Vide* Rev. A. H. T. Clarke in *The Evangelical Quarterly*, April, 1931.

Jaffa, was, like Jericho, a city of strategic importance; but its inhabitants resisted the Israelitish attempts to drive them out (Judges, i, 29). From 1902 until 1909 excavations were conducted by Mr. R. A. S. Macalister. In his book, *The Philistines* (1913), he illustrates the Canaanite practice of the sacrifice of new-born children, to which there is frequent reference in the Scriptural records. "The whole area of the High Place," he says, "was found to be a cemetery of new-born infants. That these infants were all the victims of sacrifice is suggested by their close association with the High Place, and confirmed by the fact that two at least displayed marks of fire. These infants were deposited in large jars."

(2) *Gaza.*—The work of excavation on the site of old Gaza is at present proceeding under the direction of the veteran archæologist, Sir Flinders Petrie. Abraham must have been familiar with the city, which was one of considerable size and importance in his day, being some twenty times as large as ancient Jericho. Old Gaza appears to have been the sea-port whence the Philistines shipped the wheat harvested around Gerar, which was about a dozen miles away. The walls, houses, and palaces of this ancient sea-port now being unearthed, together with the highly finished pottery and elaborate gold ornaments which have come to light, confirm the Bible narratives in that they reveal a high state of civilization in that area, going as far back as 2300 B.C.

(3) *Jerusalem.*—The Wall of Ophel, which surrounds the Temple hill, has recently been excavated. The Rev. J. Garrow Duncan, in 1926, found many fragments of inscribed pottery there. He was particularly impressed by the impregnable position of Ophel as the site of the ancient fortress of the Jebusites, upon which Zion, the city of David, was built. "It was bounded on the east and south," he writes, "by the valley of the Kidron, 300 feet deep, and on the west by the Tyropœan valley, of equal depth. It is assailable only on the north . . . so that on every side the walls were protected by deep natural moats in which an engine of war could not be brought to work with effect." In Josh. xv, 63, it is recorded: "As for the Jebusites the inhabitants of Jerusalem, the children of Judah could not drive them out: but the Jebusites dwell with the children of Judah at Jerusalem unto this day." Again, in II Sam. v, 6–7, we read: "And the king and his men went to

Jerusalem unto the Jebusites, the inhabitants of the land which spake unto David, saying, Except thou take away the blind and the lame, thou shalt not come in hither: thinking David cannot come in hither. Nevertheless David took the strong hold of Zion: the same is the city of David." Recent excavation has thus confirmed these Scriptural statements concerning the strength of this ancient citadel.

X.—The New Testament: Language and History.

Seventy years ago, Dr. Lightfoot, Bishop of Durham, the famous Cambridge classical scholar, in reference to the much-disputed theory of the nature of New Testament Greek, said: "If we could only recover letters that ordinary people wrote to each other without any thought of being literary, we should have the greatest possible help for the understanding of the language of the New Testament generally." The present century has witnessed a discovery which exactly satisfies the longings of the learned Bishop, and settles finally the question of the kind of language in which the New Testament was written.

In the year 1900, at Tebtunis, in the Fayûm district of Egypt, a great mass of papyri was discovered. Much of it was found in the cemetery, in which mummies of the sacred crocodiles were rolled in papyrus. Besides the papyri, quantities of broken pottery (called by the Greek name *ostraca*) have been unearthed. Upon these papyri and *ostraca* are inscribed all kinds of public, legal, household, and friendly notes and communications, revealing very vividly the daily life of the people in village, town, and city in the imperial Greek-speaking world. Out of refuse and rubbish heaps have been collected an immense quantity of private letters, receipts for money paid, leases and rent arrangements, tax assessments and proclamations. Most belong to the days of the Roman Empire. Their preservation has been due in part to the dry Egyptian soil, and in part to the indestructible nature of the papyrus and potsherds which contain the inscriptions.

Formerly it was thought that the New Testament was written in a special Greek of its own. It was obviously far removed from the Greek of the classical Attic literature. Neither did it resemble the Atticism—the stilted literary Greek of the period—which was an imitation of the classical Attic. Hence the idea

got abroad that the New Testament was written in a Greek of its own kind—a special vehicle for the conveyance of the Gospel revelation. Now by means of the *ostraca* and papyri of Egyptian rubbish heaps it has been revealed that the New Testament is written in the *Koiné*—the colloquial speech of the people of the Mediterranean world. Problems of interpretation have been solved and much illumination has been cast upon doubtful passages.

Two examples must suffice: (i) The word translated "daily" in the Lord's Prayer, ἐπιούσιον (*epiousion*), is a Greek word which provided a perpetual problem for scholars and commentators. According to Deissmann: "No instance of it occurs in the whole of Greek literature. And, besides, the greatest of the old Bible students, Origen, had expressly asserted that the word did not exist in the Greek language." But in a housekeeper's book of papyrus dug up in the Fayûm the words τὰ ἐπιούσια occur, and the meaning is clearly revealed. The expression corresponds with the Latin *diaria* found in a list of household requisites at Pompeii. The word in the Lord's Prayer was a familiar Greek word in common speech used for the daily allowance of food for soldiers and labourers. In the plural it was used by a lady to head her shopping or household list of the things wanted for the day. (ii) In Matt. vi, 2 occur the words: "They have their reward." Now it transpires that the Greek word ἀπέχω (*apecho*), translated "reward," was the technical expression used in giving a receipt. Deissmann, in his *Light from the Ancient East* (p. 111) says: "This technical meaning of ἀπέχω, which must have been known to every Greek-speaking person, down to the meanest labourer, applies well to the stern text about the hypocrites: 'they have received their reward in full,' *i.e.*, it is as though they had already given a receipt, and they have absolutely no further claim to reward. This added touch of quiet irony makes the text more life-like and pointed."

The value of these discoveries lies in the revelation of the fact that New Testament Greek was the language of the middle and lower classes of the people. It was thus the medium of easy and rapid transmission of the message of redemption. "The masses craved for the simple, and the divine revelation of the Gospel demanded a plain garb. . . . This simple book, with its carpenter's and tent-maker's language, was a book for all, and

it could resound, unadulterated to humanity in all centuries, the message of the Gospel which had moved men in a small corner of the Mediterranean world. . . ." "Therefore we can put the wonderful history of the Book of Humanity in one sentence: the New Testament has become the Book of the Peoples because it began by being the Book of the Peoples."*

Turning to the historical data of the New Testament, one long-standing problem has now been finally settled. St. Luke ii, 1–3 is a passage which, not many years ago, according to Sir William Ramsay, theological scholars generally regarded as "a tissue of blunders of the most marked and worst kind." Even Dr. A. B. Bruce, one of the most distinguished of Scottish theologians, in his Commentary said: "One could almost wish that verse 2 had been omitted or that there were reason to believe, as has been suggested by several writers, that it is a gloss that has found its way into the text, and that Luke is not responsible for it—so much trouble has it given to commentators."† The problem at the end of the last century was complex. There was no certain knowledge (apart from St. Luke) of any such imperial census having taken place, nor of the practice of such a method of procedure as that described. Moreover, it was known for a fact that Quirinius was Governor of Syria from A.D. 6 to A.D. 9. The problem has been solved, however, by means largely of the discovery and renovation of an ancient monument.

Shortly after the death of Augustus, in A.D. 14, two bronze pillars were erected in Rome in front of his mausoleum, containing a record of the chief incidents of his life. These two pillars have long since disappeared; but, fortunately, copies of them were set up at various places outside Italy. One such remains almost intact, at Ancyra (now Angora, the capital of Turkey), and has been known as the Monumentum Ancyranum since it was discovered in 1555. At many points, however, it is defaced, so that its exact meaning is not always clear. Another duplicate was set up in a temple to Augustus at Antioch in Pisidia; and fragments of it were discovered by Lady Ramsay

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* Deissmann: *The New Testament in the Light of Modern Research*, pp. 106, 136.

† *The Bearing of Recent Discovery on the Trustworthiness of the New Testament.*

in 1914. Most of them were exceedingly small, and the work of arranging them accurately was interrupted by the intervention of the Turkish authorities. But in 1928 the work was completed by the arrangement of the fragments in slabs of concrete 3 feet high. Supplementing in the most valuable manner the Monumentum Ancyranum, they establish:

(i) The fact of a periodic imperial census. A translation of a part of the Monument reads as follows: "I three times made up the roll of the Senate and in my sixth consulship (28 B.C.) I took a census of the people with M. Agrippa as my colleague.... A second time, with consular imperium, I took the census by myself in the consulships of Gaius Censorinus and Gaius Asinus (8 B.C.) in which the number of Roman citizens on the roll was 4,233,000. I took a third census with consular imperium, my son Tiberius Cæsar acting as my colleague, in the consulship of Sextus Pompeius and Sextus Appuleius (A.D. 14) in which the number of Roman citizens entered on the roll was 4,937,000."*

(ii) That Quirinius was certainly in command in Syria at the time of the census in 8 B.C. Apparently, Sentius Saturninus was the civil Governor, while Quirinius was the commander of the forces in Syria and Cilicia. Sir William Ramsay has proved that it was the Roman custom for a general engaged in frontier war as the direct representative of the Emperor, to rank superior to the ordinary Governor, who carried on his civil duties as usual.

(iii) As to the procedure of the census described, a papyrus now in the British Museum contains an edict of G. Vibius Maximus, governor of Egypt in 104 B.C., in the following words: "The enrolment by household being close at hand, it is necessary to notify all who for any cause soever are outside their homes to return to their domestic hearths, that they may also accomplish the customary dispensation of enrolment and continue steadfastly in the husbandry that belongeth to them."

The conclusion which I submit may be drawn from the above is: (i) St. Luke wrote his Gospel about sixty years after the events which he here describes. He wrote, fully aware of the historical fact that Quirinius was Governor of Syria from A.D. 6 to 9. He knew also that during his governorship a taxing census had been taken which had created a revolt among the

* E. S. Shuckburgh, *Augustus: The Life and Times of the Founder of the Roman Empire*, p. 394.

Jews. To this he refers in Acts v, 37, when reporting the speech of Gamaliel: "After this man rose up Judas of Galilee in the days of the taxing, and drew away much people after him"; (ii) St. Luke, therefore, is careful to point out that the census at the birth of Jesus was the one anterior to this. In Ramsay's words: "This passage could only mean that Luke referred to some system of taking the census from time to time, that this system was inaugurated by a decree of the Emperor Augustus, and that Jesus was born in the year of the first census-taking."*

That 8 B.C. is the actual date of the Nativity has been endorsed by many scholars. Canon Knowling, in a paper read before the Victoria Institute, maintained that this date is now indisputable. According to Tertullian, Jesus was born when Saturninus governed Syria, which was from 9 B.C. to 6 B.C.

The prescribed limits of the essay permit of only a few additional references to recent discovery. (i) The site of Capernaum now appears at last to be fixed in favour of Tell-Hûm, with its ruins of the synagogue. What personally impressed me most when I visited the neighbourhood as a striking fulfilment of prophecy was the complete obliteration of the three cities, Capernaum, Bethsaida and Chorazin, which were condemned by our Lord, and the barrenness of the district which in His day was the centre of a teeming population.

(ii) Turning to the Acts, Captain Raymond Weill, in 1920, discovered in Jerusalem a Greek inscription which reads: "Theodotus, son of Vettenos, priest and ruler of a synagogue, son of a ruler of a synagogue, grandson of a ruler of a synagogue, built this synagogue for the reading of the Law and the teaching of the Precepts; and the hospice, and the chambers, and the installations of water, for the use of those from abroad in need thereof." It is conjectured, with some degree of assurance, that this synagogue was "the synagogue of the Libertines" referred to in Acts vi, 9, whose members were so bitterly opposed to the teaching of Stephen. The "Libertines" were almost certainly Jews from abroad who had previously been carried into captivity.

(iii) Additional information about Sergius Paulus (Acts xiii, 7) was discovered by Sir William Ramsay in 1912, who found at Antioch a Latin inscription bearing the name of "the deputy"

* *Op. cit.*, p. 239.

as "one of the four Commissioners in charge of the Roman streets," with the titles also of "Tribune" and "Quæstor."

(iv) An inscription was found, in 1909, by Mr. W. M. Calder at Baluklaou, south of Lystra, relating the dedication to Jupiter of a statue of Mercury. This illustrates the story of the visit of Paul and Barnabas recorded in Acts xiv, and the devotion of the people of the city to those two divinities.

Concerning Luke's historical trustworthiness, Ramsay writes (p. 89): "I set out to look for truth on the borderland where Greece and Asia meet, and found it here. You may press the words of Luke in a degree far beyond any other historian's, and they stand the keenest scrutiny and the hardest treatment, provided always that the critic knows the subject and does not go beyond the limits of science and of justice." And, with respect to the New Testament generally, Deissmann's weighty testimony may fitly bring this review to a close: "The foundations of our historical knowledge of Early Christianity, taken as a whole, seem to me unassailable. Although hidden to those eyes which cannot see into the depths, they lie huge and massive and imperishable in the depth."*

Discussion.

Lieut.-Colonel F. A. Molony said: Two points regarding the capture of Jericho, Ps. cxiv, 3–7, hint that the fall of the walls *was* due to earthquake, because it reads, "The sea saw it and fled"—doubtless an allusion to the drying of the Red Sea. "Jordan was driven back," due to a cause which has had the same effect at least twice since. Then, when we should expect an allusion to the capture of Jericho, we read "The mountains skipped like rams, and the little hills like lambs." Now, the Israelities were doubtless standing when they shouted, and, to anyone trying to keep an upright position during an earthquake, it would certainly seem that the mountains skipped like rams. In the seventh verse the psalm says "Tremble thou earth."

But I can hardly agree with our lecturer about the purpose of the perambulation. It would have to be made at a long bow-shot

* *The New Testament in the Light of Modern Research*, p. 166.

from the walls, and I doubt if the rhythmical trampling of many feet would affect them. I think it was for a psychological purpose. If the earthquake had happened the first day, the Israelites themselves might have been so frightened as to flee. But the walking round every day for six days fixed their minds on the city. Then, on the seventh day, when they had completed seven rounds, and were bidden to shout, they would naturally expect a climax, so, when the earthquake came, they still kept their eyes on the walls, and, seeing them fall, they rightly concluded that God was working for them and rushed forward and took the city.

The Rev. H. C. MORTON, B.A., Ph.D.: My justification for taking a moment's share in the proceedings to-day might be that for twenty years I have been writing, generally anonymously and perhaps sometimes too daringly, upon archæological topics, and endeavouring to focus public attention upon this great subject.

Dr. Hart-Davies has compiled an exceptionally excellent summary of the results achieved during the last thirty-five years, and seems to have both included and omitted with judgment. It must not be taken as detracting from my admiration of his Paper if I make two critical suggestions.

The one concerns the dating of the Exodus. That Dr. Hart-Davies is right in concluding that Jericho fell somewhere about the time of Amenhetep III the scarabs make certain. His scarabs are found, and none later than his; but it is not at all beyond question that it fell during his reign. The Tel-el-Amarna letters are, some of them, addressed to Akhenaten, and that would point to Akhenaten's reign as the time of the fall. I ventured ten or more years ago to suggest that Akhenaten's refusal to aid his vassals against Joshua was probably because the King had learned from the Israelites his "new religion of love," and, realising that his only allies in the new beliefs were the Israelites, he refused to take any part with his unscrupulous and idolatrous vassals against them. I am glad to note that opinion is steadily moving toward such a view.

But let it be granted that the time of the fall of Jericho was Amenhetep III or IV (Akhenaten), that by no means settles the date in years. He would be a very bold man who put forward

the plea that we now know Egyptian dates with comparative certainty. To say Amenhetep III is quite a different thing from saying 1413–1377 B.C. I presume that the lecturer is using ordinary Ptolemaic dating, and, if that is so, Anstey gives the ordinary Ptolemaic dating of the Bible for the Exodus as 1612 B.C.—and Anstey is a very careful calculator, holding very firmly to the Bible. One item to be borne in mind is that when I Kings vi, 1, says 480 years from the Exodus to the Temple, it is omitting all the periods of " the Servitudes " and also the reign of Abimelech, 114 years in all. It is most risky for us, who maintain the accuracy of the Bible, to accept hastily any present dating of the Egyptian kings.

The second criticism is geographical. On page 21, Dr. Hart-Davies says : " The Wall of Ophel, which surrounds the Temple Hill, has recently been excavated. The Rev. J. Garrow Duncan, in 1926, found many fragments of inscribed pottery there."

Various things perplex the reader here. First, why is Professor R. A. Stewart Macalister, who was the chief excavator of the Hill of Ophel, to whom also Bible students owe a great but scantily recognised debt, omitted altogether ? He and Mr. Garrow Duncan were associated in the work, and are jointly responsible for the fine volume of the Palestine Exploration Fund, describing the wonderful results. Mr. Duncan's smaller personal work on the subject was a year or two later ; but the work was done in the season 1923–24.

Moreover, I would ask Dr. Hart-Davies : Is he right in even including the Temple area in the Hill Ophel ? I do not think he is. The ridge was all one before Solomon, but Solomon built up the mighty wall of the Temple area, clearly dividing the northern from the southern part. The northern has always been called since that time Mount Moriah, and the name Ophel has been, I think, entirely confined to the southern part, on which the Jebusite fortress was built. At all events, the excavations were not on the Temple wall but on the ancient fortress wall, and that wall does not surround the Temple area but only the southern ridge, as Macalister made very clear in his excavations. I have wandered much over this site, and it must not for a moment be confused with the Temple site.

If I may add one other word, the biggest result of archæological research appears to me to be this : That as the archæologist works,

he fills in the background behind the Bible history, and as we get the background we find how admirably the Bible histories fit into it. When the picture fits the frame, and the frame admirably sets off the picture, the harmony of the two is very impressive—or, in other words, the probability of the historic character of the picture is overwhelming.

Author's Reply.

I desire first of all to express my sincere gratitude for the attention which you have so kindly given me while reading my Essay. It contains, according to requirements, close upon 15,000 words. A moderate rate of reading is a hundred and twenty words per minute. If we were to comply strictly with the regulations of the Gunning Prize, a period of over two hours would be occupied in the reading of the entire Essay. I have, therefore, been compelled to read only selected portions; yet I have had to transgress, leaving very little time for discussion. I will try to deal briefly with the kind criticisms which have followed.

In reply to Colonel Molony, I am disposed, with Professor Garstang, to believe that some earth tremor operated to bring about the collapse of the walls. That this should have happened when it did reveals Divine prescience and overruling. My own suggestion is purely suggestion. I do not stress it. But I am growingly convinced that one day we shall discover that what we now call miraculous will prove to be accelerations of forces in the realm of the natural. Moreover, we do well always to remember that God condescends to employ human and natural agencies, with His mighty power behind, for the accomplishment of His purposes both in the realm of nature and of grace.

Dr. Morton's chronological reference is worthy of very careful consideration. I am far from being an authority in such a matter. I am inclined to adopt Professor Garstang's date for the Exodus and the Fall of Jericho; but Dr. Morton's arguments are weighty ones, I must admit.

Respecting the Hill of Ophel and the precise site of the Temple area, I ought certainly to have made some reference to Professor Macalister's splendid work. But there are other notable authorities in the realm of Archæology who are not mentioned. The length

of the Essay was strictly limited by regulation; and much was omitted that one would fain have included. I am glad to note, however, that both Colonel Molony and Dr. Morton are at one with me in the recognition of the amazing wealth of archæological evidence which has come to light in recent years to confirm the historic integrity of Holy Scripture at many points which were deemed by critics to be most vulnerable.

786TH ORDINARY GENERAL MEETING

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, FEBRUARY 25TH, 1935. AT 4.30 P.M.

AVARY H. FORBES, Esq., M.A., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed, and the HON. SECRETARY announced the following elections :—As Associates : Edward J. G. Titterington, M.B.E., M.A., Rev. E. E. Ralph, Capt. H. Lechmere Clift, M.B., Ch.B., J. F. Smith, Esq., Ernest H. Channon, Esq., W. Leonard Bedwell, Esq., B.Sc., Ph.D., and W. H. Drury Yule, Esq.; and Captain G. S. Dobbie, M.C., as Missionary Associate.

The CHAIRMAN then called on Mr. W. N. Delevingne to read Dr. E. McCrady's paper on "Berkeley's Idealistic Philosophy and its Influence in Modern Thought," the author being unable to attend.

BERKELEY'S IDEALISTIC PHILOSOPHY AND ITS INFLUENCE IN MODERN THOUGHT.

By EDWARD MCCRADY, D.D., Professor of Philosophy, University of Mississippi, U.S.A.

THE essence of Berkeleyan Idealism may be summarised in the statement—*Consciousness is Reality.* To catch the true meaning of Berkeley, we must not translate his famous dictum "*esse est percipi*" too literally. When he affirms that "to be is *to be perceived,*" he means only that "to be is *to be experienced*" (in some way) in consciousness. He does not mean that Being is confined to the data of what is technically termed "Perception," as distinguished, for example, from the data of "Conception," "Sensation," or "Feeling." He means that Being is synonymous with the content of *any* and *every* state of consciousness. Whatever is "real" to consciousness, is what we mean by a "reality" to consciousness. As consciousness and its content, therefore, are one, we say, in general, that "Consciousness is Reality."

It is indeed true that because there are different modes of conscious experience (*e.g.*, Feeling, Sensation, Perception, Conception, etc.), there are, of necessity, different "*orders*" of Reality, and as it is necessary for us to distinguish these diverse orders of Reality it becomes further necessary for us to use such terms as Being in contrast to Existence; Noumena in contrast to Phenomena; Potential entity *v.* Actual entity; Substance *v.* Accident; Spirit *v.* Matter, etc. All these experiences being "real" to consciousness possess some kind of "reality"; but because they are but so many differentiations of such consciousness (so many modes of its fundamental Being) we denote Consciousness itself as the *Supreme Reality*, capitalising the latter word to distinguish it from all lower or subordinate forms of Reality.

It is very important that this interpretation of the word "Reality" be clearly understood, as it is the answer of Berkeleyan Idealism to all forms of Realism, old or new, which are vainly proffered to the world as substitutes therefor. Paradoxical as it may appear to the uninitiated, there is no true Realism apart from Idealism. A reality which is not "real" to *some* consciousness is not a "reality" at all. The expression is nothing more or less than a contradiction in terms, and the men who to-day are seeking to justify such an assumption are pursuing a "will-o'-the-wisp." Yet, unfortunately, we have volumes of solemn scientific and philosophical literature wasted on this attempt to think the unthinkable, and *realise* the *un-real.* But more of this anon.

Consciousness is a unity-in-difference—*i.e.*, a "polarity," or, better still, being dynamic, a "*polarisis.*" This has been recognised by many writers. Herbert Spencer long ago defined it as a unity of "*differentiation and integration.*" So also Hegel takes the same view, and since (as just stated) Consciousness is Reality, he further explains Reality on this *Principle of Contradiction.* Now, while it is quite true that Berkeley has left no explicit statement on this point, and it would be too much to affirm that he clearly understood all that was involved in the problem, yet, nevertheless, there can be no doubt that he took his ground on what happens to be the real truth of the situation. He asserts, in effect, that Consciousness is a bi-polar experience—that we are simultaneously aware of two antithetical (polar) experiences—a positive and a negative datum—in every act of

thought. The data of the positive pole of experience are what he calls *Ideas*, while the data of the negative pole he designates *Notions*. The data of the positive pole are formal, objective, and, for the most part, clearly defined, as contrasted with the data of the negative pole which are formless, subjective and undefined. Moreover, the former he affirms to be "static," while the latter have the peculiarity of being "dynamic" in character. In general, we may say that he intends to affirm that Consciousness (which is Reality) presents us with two modes or differentiations—viz., *Phenomena* and *Noumena*. The Phenomenal World is the world of "Ideas"; the Noumenal World is the world of "Notions." We have a genuine experience of both these realms, but as differentiations of Consciousness—and, consequently, as "orders" of Reality—they are wholly antithetical. We may briefly contrast these two orders of experience as follows:

NOTIONS (*Feelings*).	*IDEAS* (*Cognitions*).
Sensations	Percepts or "Objects" Images or Memories.
Emotions (Urges)	Instincts
Will Ego Soul Life	Representations (Concepts)
Power (*i.e.*, *Potential* Energy)	*Actual* Energy
Spirit	Matter
Cause	Effect

The one sphere (*Notions*) constitutes our Intuitions, Feelings, Apprehensions or immediate experiences of Reality; the other (*Ideas*) constitutes our Objectifications, Representations, or Symbolisations of the Reality so "felt" or "intuited." The one is the sphere of "Gnosis" or pure spiritual experience; the other is the sphere of "Cognition" or "formal," "representational" experience.

Ideas are themselves, in turn, divided into two distinct classes, viz.: (*a*) Those which appear and disappear with every act of

the Will; and (*b*) those which appear and disappear independently of volition. The former being self evidently under the control of the Will, are experienced immediately as the *effects* or *creations* of the Will. Since the Will is intuitively experienced in the very act of producing these phenomena, it is directly experienced as the *cause* of which they (the phenomena) are the *effects*. Here, then, we have the explanation of our notions of Causality. It is this simple, direct, self-evident experience of our own a-phenomenal Wills in the very act of producing this class of phenomena (*i.e.*, the particular group of Ideas designated above)—an experience incessantly repeated at almost every moment of our lives—that constitutes the whole source of our conceptions of Cause and Effect. The Phenomenal is produced by the A-phenomenal; for Conscious Will or Ego is directly experienced in the very act of *creating* its own little phenomenal world.

What, then, must be said with regard to that other and very much larger world of Ideas—the phenomena of Sense-perception—which are altogether beyond our Wills to control; which appear and disappear in complete independence of volition; nay, more, which actually seem to be thrust upon our consciousness, oftentimes, in defiance of our volitions? The answer is obvious. They must be the effects of *similar causes*—that is, of Wills *other* than our own. In short, they must be the effects of *other* Wills, Selves, or Egos, acting upon us *ab extra*. Since within the sphere of our daily experience, we see certain Ideas or Phenomena actually arising from Conscious Will as their Cause or Creator, we naturally and logically conclude that all other Ideas or Phenomena are to be attributed to a like cause, or a number of such causes, *without* or *external* to ourselves. To quote our great philosopher: "I find I can excite ideas in my mind at pleasure, and vary and shift the scene as often as I think fit. It is no more than willing, and straightway this or that idea arises in my fancy; and by the same power it is obliterated and makes way for another. This making and unmaking of ideas doth very properly denominate the mind active. This much is certain and grounded on experience: but when we talk of unthinking agents, or of exciting ideas exclusive of volition, we only amuse ourselves with words. But whatever power I have over my own thoughts, I find the ideas actually perceived by Sense have not a like dependence on my Will.

When in broad daylight I open my eyes, it is not in my power to choose whether I shall see or no, or to determine what particular objects shall present themselves to my view; and so likewise to the hearing and other senses, *the ideas imprinted on them are not creatures of my Will. There is therefore some other Will or Spirit that produces them.*"—(*Prin. of Human Knowledge*, Part I., Sect. 28, 29.)

Now it will readily be seen from this (and other like passages might easily be adduced) that Berkeley makes no claim of having any direct experience of spirits other than his own. Every man, he contends, is self-conscious—*i.e.*, directly intuits his own Ego—but no man directly intuits the Soul of another.

Nevertheless, he logically and unavoidably infers the existence of such other Selves from the numberless phenomena which appear and disappear independently of his own volition. These events can be accounted for in no other way.

But let us be sure that we understand the full significance of this statement. We say that these phenomena can be accounted for in no other way. But why need they be accounted for at all? Why do we ever deem it necessary to seek a *cause* for these or any other appearances? Why do we not take such things at their face value, simply as events, and eliminate the notion of a cause altogether? Why not, as Auguste Comte suggested, strike the word from the vocabulary of science? The answer is that the actual experience of our own Wills in the very act of "causing" or "creating" that particular group of ideas which we call our own, will not allow us to ignore the question of causality, for it inevitably suggests that the appearance and disappearance of all other ideas (phenomena) must have a similar origin; and (we may here add) that inasmuch as the only cause we know anything about is Will, it follows that this is also the only thing *meant* by the word; so that if we are compelled to assume a cause for any other phenomena, we are likewise compelled to regard such cause as identical in nature with what we also refer to as "Will." Since we know no other cause than Will, all that we can *mean* by the word is Will. Either, then, we must deny with Comte, and in defiance of actual experience, that there is any Substantial Agent or Cause of the phenomena of nature; or else, if we assume a cause at all, must conceive it to be of the nature of Self-conscious Will. We may sum up the whole matter by saying that *Will and Cause*

are but two names for the same experience; whence it follows that to substitute anything else as the creative principle of the phenomena of nature is simultaneously to change the very meaning of the word ("Cause") and to ignore the self-evident facts of experience.

Accordingly, Berkeley attributes the origin of all phenomena to the acts of an All-Supreme Spirit Who as an "Over-ruling Providence" works ever in and through the lesser agencies of created spirits for the accomplishment of His own peculiar and immutable designs. For "though there be some things," says he, "which convince us *human* agents are concerned in producing them, yet it is evident to every one that those things which are called the Works of Nature—that is the far greater part of the ideas or sensations perceived by us—are not produced by, or dependent upon, the Wills of men. *There is*, therefore, some other Spirit that causes them; since it is repugnant that they should subsist by themselves. . . . But, if we attentively consider the constant regularity, order, concatenation of natural things, the surprising magnificence, beauty, and perfection of the larger, and the exquisite contrivance of the smaller parts of the creation, together with the exact harmony and correspondence of the whole; but above all the never-enough-admired laws of pain and pleasure, and the instincts of natural inclinations, appetites, and passions of animals—I say if we consider all these things, and at the same time attend to the meaning and import of the attributes One, Eternal, Infinitely Wise, Good and Perfect, we shall clearly perceive that they belong to the aforesaid Spirit, "Who works all in all" and "by Whom all things consist."

Hence, it is evident that God is known as certainly and immediately as any other Mind or Spirit whatsoever distinct from ourselves. We may even assert that the existence of God is far more evidently perceived than the existence of men; because the effects of Nature are infinitely more numerous and considerable than those ascribed to human agents. There is not any one mark that denotes a man, or effect produced by him, which does not more strongly evince the being of *that Spirit who is the Author of Nature.*"—(*Id.*, Sect. 146, 147.)

Now with this brief outline of Berkeley's general position before us, we are in a position to consider some of the many misinterpretations which have been placed upon his views. First of all, the charge that Berkeley was a Solipsist may be dismissed

at once, for no one really acquainted with his writings, or understanding the purpose which he had in view, would bring such an accusation against him. His own repeated statements concerning the reality or other Selves existing independently of his own Ego, as well as of One Supreme Spirit, the Maker and Creator of all things, "in Whom we live, move, and have our being"—to say nothing of a number of other statements regarding the existence of a genuine phenomenal world lying beyond the range of his *personal* perception—all these things completely shatter such a supposition. Fortunately, there are few, if any, real students of his philosophy that entertain such an opinion, and—we may further add—it is very questionable if there has ever been a real Solipsist in the history of philosophy, although some writers, through carelessness of expression, have occasionally laid themselves open to the charge. As has been well said, Solipsism "represents only an hypothetical position"—a theoretical possibility. Berkeley, then, was no Solipsist but was as emphatic in his belief in the reality of a world existing independently of his *personal* consciousness as the most radical of present-day Realists. What he denied was not the existence of a "real" world beyond the limits of his personal experience but the reality of any world which, though being independent of his *individual* consciousness, was, simultaneously, assumed to be independent of *all* consciousness—*a world whose being did not consist in its being perceived by any consciousness whatsoever.* That is to say, if by Realism you mean belief in the reality of a world of *Spiritual Agencies* (together with "things" or "objects" whose very being consists in their being perceived by such Spiritual Agents) existing independently of one's *individual* consciousness; Berkeley was a genuine Realist. But if, on the other hand, you mean by Realism that doctrine which affirms that there are "things" and "objects" whose being does not consist in their being perceived or experienced by *any* consciousness whatever, and which, therefore, exist independently not merely of one's *individual* consciousness, but independently of the consciousness of *any* Spirit, created or Divine, then Berkeley was not a Realist; and, for the very good reason that such "things" or "objects" contradict all that we mean, or can mean, when we use these words. For it is self-evident that the words we use are only "signs" or "symbols" for certain "ideas" or other "experiences" present to

our consciousness, and have no meaning apart from these *mental* experiences; so that a word (so called) which, by hypothesis, is said to refer to something different *in kind* from *any and every mental experience*, has no meaning at all—it is not a *word*, but *a meaningless sound*. Self-evident as is this fact, it seems to have completely escaped the observation of Berkeley's critics. That a naïve Realism should have existed in his day, and even since his time, should still exist among those who have never heard, or never understood, this central principle of the Idealism which he taught, should occasion no surprise; but that sober philosophical minds should be misled, at this late day, into all the ramifications and hair-splitting subtleties of Neo-Realism, Critical Realism, and other similar attempts to minimize or distort this fundamental and self-evident fact, is indeed amazing.

For, after all is said and done—after all the epistemological cobwebs have been brushed away—we find ourselves back again at the very point from which the whole discussion originated; face to face with precisely the same issue with which Berkeley was confronted; with no refutation of his original argument to advance, and with practically nothing of importance accomplished.

That the New Realism is nothing more than a re-statement, in somewhat more refined and technical language, of the naïve Realism with which Berkeley was concerned, and, consequently, is infected with the same essential error, is obvious from the admissions of its own exponents. As one of the authors of the New Realism has himself expressed it, this interpretation goes back "to that primordial common sense which believes in a world *that exists independently of the knowing of it*," though one which "*can* be directly presented in consciousness. . . . In short, the New Realism is, broadly speaking, *a return to* that naïve or natural realism" (italics ours). Now had the writer been content to affirm that he believed in a world that exists independently of the consciousness of *any one individual mind*, he would be only reiterating the statement of Berkeley, and there would be no occasion for comment one way or another. But, as is well known, this is not his meaning, for the whole point of the New Realism is to be found in its direct opposition to this Berkeleyan principle. In short, the very essence of the argument consists in the assumption that "things" though they *may* appear to consciousness (*i.e.*, to *any* consciousness) from

time to time, are not dependent upon such a relation, but can, and do, exist oftentimes in complete independence of *any* mind, human or divine. In a word, the advocates of the New Realism flatly contradict the fundamental tenet of Berkeley that the *being* of a thing consists wholly in its *being perceived* or *experienced* —*i.e.*, being a datum of *some* consciousness. They assert that "things" which are not data of *any* consciousness whatever do actually exist. Now we would like to ask right here What is the meaning of the word "thing" as applied to that which has never been experienced by any consciousness whatever? What can any word *mean* to me which, by hypothesis, refers to a something never experienced by my mind or any mind? Words are only symbols which we employ to denote our *mental experiences*, and it is self-evident that they can have no meaning apart from these *mental* experiences. When a word refers to a specific datum of consciousness, we say that we "understand" it—know its *meaning*. But when it is said to refer to a something different from any kind of mental experience whatever—different from any and all data of consciousness (*i.e.*, different from any kind of mental reality), the statement is meaningless. This word "thing," therefore, either refers to some mental experience, and so has meaning; or else it refers to no mental experience, and consequently has no meaning whatever. In short, a "thing" which, by hypothesis, is different in kind from any mental experience we have ever had is necessarily different from any thing that you or I *mean* by the word. Hence, there is no man living—not excepting the most sophisticated Realist—who knows anything whatever about the *non-mental* "things," "objects," "existence," etc., which he so learnedly discusses. Such a man is simply using words without meaning.

Of course, what is said about the New Realism applies with even greater force to Critical Realism, since, unlike the former, this latter theory denies the possibility of such "entities" ever coming within the sphere of experience under any circumstances. There are, of course, epistemological problems which still further distinguish the two theories, but with these we are not at present concerned. It is only the fundamental fallacy common to both that we need here consider. The obvious difficulty of discussing any kind of "object" or "entity" which has never, and can never, be experienced in consciousness—which is simultaneously alleged to be *known* and *unknown*—is so plain a contradiction

that it does not deserve serious consideration.* Nor is there any relief for the hard-pressed advocate of the theory in the much advertised *doctrine of essences.* For if this is intended to signify anything different from the pure "notion" of Reality advocated by Berkeley on the one hand, or the mere "implication" view of Kant on the other, it simply resolves into an ingenious but futile attempt to straddle a contradiction. Happily we are not alone in these opinions, as recent criticism is full of such charges. "Critical Realism," say Gamertsfelder and Evans, "is an ingenious theory. It represents, however, more the desire to present an epistemology which will give a logical explanation of error than a concern to interpret knowledge as it appears to us on observation or introspection. If the datum is purely a logical subsistent, then it is really a fiction of the imagination, interesting but not verifiably true. If the essence is a storehouse of concrete experience, then it is the datum *Mind, presented in personal Idealism.* One wonders how we may be sure that the essence truly represents the objective reality, *or even how we can be certain that the external object is actually there.* If the assurance is to come by arbitrary postulation, why not be a New Realist and let the datum be the objective real, *or an Idealist and call it mental content?* The notion of essence seems to raise more problems than it solves"—(*Fundamentals of Philosophy*, p. 250). Says another writer, "Its difficulties are immense. . . . There are sharp differences between his (Drake's) form of the doctrine and that of Santayana, which the critics have not failed to notice; Santayana and Strong now seem to be practically alone in their position, while Sellars is as active in his opposition to it as any other critic. . . . The position as a whole has gradually been recognized as lacking in true originality. . . . Recent studies of current philosophical movements have shown a marked tendency to ignore it entirely. . . . In addition, the group has completely lost solidarity; they are divided not

* We are fully aware that it is the "*existence,*" and not the "*nature*" of the "object" that is assumed to be known. But that is the very point. Existence itself implies *mental* contingency, for the word itself is only a name which we have given to *a certain experience of our minds—i.e.*, a certain *mental* fact or datum. It asa no meaning whatever apart from this *mental* fact or experience—hence an existence which is alleged to be *non*-mental is a contradiction in terms—it is an existence different from all that is meant by the word.

only upon the doctrine of essence, or the nature of data, but also upon the monistic or dualistic nature of knowledge. It is probably an accurate statement that at present Santayana, Drake, Lovejoy, and Sellars represent four distinct types of theory. And some observers believe that under the withering fire of criticism even the doctrine of essence is about to be renounced by its advocates.

The situation is similar in Neo-Realism. Marvin, Pitkin, and Holt have abandoned the field. Spaulding has written little lately, and is known recently chiefly for his adherence to the doctrine of Emergent Evolution rather than for any further development of Neo-Realism. Perry's recent writing has been in the fields of history and the theory of value, though he has retained the most positively neo-realistic attitude. Montague has veered away from the others—or they have veered from him, as may be preferred—on the point of the type of the realities to be accepted. He thinks that "if Neo-Realism is to mean an ontological equalitarianism in which existential status is to be accorded to every content of perceptual experience, whether veridical or illusory, then such a theory is not Realism at all. . . . I would rather be an Idealist, at least a Kantian Idealist, than swallow any such a mess. . . . Once more . . . I am left without a party."—(Victor E. Harlow, *Bibliographic and Genetic Study of American Realism*, pp. 100–103.)

Without entering into further details, the above should be sufficient to show how hopeless is the attempt to discover a valid foundation for any form of Realism which denies this axiom of Berkeleyan Idealism. Manifestly the "ontological object," so called, is either an actual datum of conscious experience or it is not. If it is an actual datum of experience, then, like the epistemological object, it is *a datum of consciousness—a mental fact.* If it be not a datum of our own consciousness, it may, nevertheless, exist as a datum of some other consciousness; but if we assume that it is an "existence" present to no consciousness whatever, then it follows as the night the day it is an "existence" different in kind from all that we mean by the word "existence"; for all that *any* word can refer to (and be intelligible) is some kind of mental fact or experience. We cannot repeat it too often, a word is simply a symbol for some "idea" or other mental experience, and a word which by hypothesis refers to no "idea" or mental experience whatever is a word which has no meaning. The *meaning* of a word is

simply the *mental datum* to which it refers—the particular *mental experience* it was intended to symbolize or represent. We can never *mean* by any word, therefore, more than what is present to consciousness—hence more than some *mental fact*. A *non-mental* entity, thing, or object, is simply a contradiction in terms.

In conclusion, then, we affirm that there is no "ontological object" in the sense of some "unfelt," "unexperienced," "unknown and unknowable Reality"—a somewhat existing independently of *all* consciousness (and so different from all that we mean or can mean by "existence," "Reality" or what not which in some utterly inexplicable manner "comes into our consciousness" from time to time. On the contrary, what we are endeavouring to signify by that word is a genuine mental experience—a "*feeling*" of a "dynamic presence" which we variously characterize as the experience of "Power," "Energy," "Will," etc.; and which though a "*feeling*" only, we persistently try to "*interpret*" or "*cognize*" in the form of "Ideas," "Concepts" and other (objective) "Representations" of the imagination. In doing so, however, we are always aware that the "Representation" is a *symbol* only of the "*Reality*," and not the Reality itself, just as the x and y of the mathematician are but *symbols* only of the quantities which they represent. If the "urge" of this "presence" were not antecendently "felt," there would never be any attempt on our part to "cognize" or "understand" it. It is this very fact of something already present to consciousness—*felt*, but not *understood*—that prompts the act of cognition. It is a somewhat *already* present to the mind that we are trying to comprehend, not an absolute nothing. No one ever tries to "understand" what has never entered his consciousness. It is an immediate datum of consciousness, therefore, a real *entity*, *felt* but not *understood*, that we are seeking to explain, interpret, cognize. In short, the "Feeling" is a direct "*gnosis*" or intuition of the Reality; while the Idea, Concept, etc., is only a "*cognition*," representation or symbol thereof. Such an interpretation sweeps aside all the epistemological cobwebs of Realism and gives us a sane and logical (as well as idealistic) explanation of the mystery.

It would be interesting to trace the influence of Berkeleyan Idealism in yet other fields of present-day speculation, but space prohibits such an undertaking. No sketch would be complete,

however, which failed to make a brief allusion to the conquests of Idealism in the domain of recent physico-mathematical research. Fortunately, the complete revolution which has been wrought in this department of thought has been so cogently set forth in the works of Viscount Haldane, Eddington, Jeans, and many other writers, and has withal been so widely advertised in popular literature, that its discussion need not detain us here. It is a matter of some surprise, however, to find how slow has been the awakening in the sphere of the biological sciences. In this department, mechanistic interpretations have, until quite recently, been singularly dominant. Nevertheless, the swing of the pendulum in the direction of a Neo-Vitalism closely akin to that which has been so long and ably defended by Driesch and G. Wolff is now clearly discernible in the utterances of such noted authorities as William Patten, J. Arthur Thomson, J. S. Haldane, and others. Everywhere we look the evidence is the same. The day of the old Materialism is gone for ever.

With this hasty epitome of the situation before us, it only remains to address a few remarks to those of my fellow-Christians who, though honouring Berkeley as a man, and gladly acknowledging his sincerity of purpose as a loyal *Defensor Fidei*, are nevertheless just a little wary of his "fine-spun metaphysical argument." Be assured, there is nothing to fear in anything that he has written, for when properly interpreted, we discover in his philosophy nothing more than what is implicit in the orthodox Faith. Let it be understood once for all—Berkeley had not the most remote intention of denying the reality of an external world. On the contrary, he repeatedly asserts the existence of such a world. He never for one moment denied that there was a real *Substance* underlying the phenomena of nature. He only denied that there was, or there could be, any substance to such a phenomenal world *other than Conscious Will or Spirit*; and for any Christian Man to deny that proposition is to deny the plainest statements of Holy Writ. It is the Materialist with whom Berkeley is dealing, and he tells him that an underlying Substance there certainly is, but it is a *Spiritual* and not a *Corporeal* Reality. It is a SPIRIT, not just one more block of MATTER. In short, he argues that the underlying Substance which "creates," upholds or *gives existence to* the whole Universe of Matter—that "Reality" in whom "all things live, move, and have their being"—is nothing more or

less than a *Divine Spirit—God*. Matter is simply a product of this Divine Mind or Spirit, and has no existence whatever apart therefrom. As Christian men we should be the last persons in the world to find fault with such a proposition, for this is precisely what the Scriptures everywhere proclaim. "In the beginning God created (*i.e.*, gave existence to) the heaven and the earth" (Gen. i, 1). But who or what is God? Just another *material body* like the earth? No. God the creator of Matter—the Substance which gives it existence, is not Himself a *material* but an *Im-material* Reality. "*God is a Spirit*" (St. John iv, 24)—a *Conscious Mind* or *Intelligence*, and it is this same Divine Mind or Spirit Who through His *Reason* ("*Logos*") "*made the worlds*" (*i.e.*, all "Matter" and material things) and is even now (as "Substance") "*upholding* all things by the Word of His Power" (Heb. i, 1–4). In short, inasmuch as the Scriptures plainly assert that the entire material world, and all that therein is, is the creation of the Divine Mind, and has no existence apart from this Creative Mind, they as plainly assert that *all Matter is the product of Mind*, and can have no existence whatever apart therefrom; and this, after all, is Berkeleyan Idealism.

Discussion.

Mr. Avary H. Forbes: The paper suffers from two disadvantages: (1) too much psychological learning and (2) absence of any explanation of Berkeley's argument.

From over forty years' experience of teaching (of both sexes and all ages), I have found that the greatest scholars are seldom the best teachers. Brilliant and learned teachers cannot stoop their intellects to the level of students and pupils, but expect them to grasp big problems and their solutions in the few words which sufficed for themselves to take them in.

Dr. McCrady, noticing our somewhat flamboyant sub-title—"Philosophical Society of Great Britain"—has taken the Victoria Institute for a body of expert metaphysicians familiar with all the up-to-date varieties of ontological and psychological postulates and speculations. Accordingly the doctor makes no attempt to reproduce Berkeley's great argument, but contents himself with defining the *conclusions* of the same. For instance, we have on the first page: "The essence of Berkeleyan idealism may be summed up

in the statement: consciousness is reality: *Esse est percipi*—"*to be is to be experienced*"; "being is synonymous with the content of any and every state of consciousness"; "Consciousness is reality"; "We denote consciousness itself as the *Supreme Reality*"; "A reality which is not real to *some* consciousness is not a 'reality' at all." These definitions imply a full familiarity with the whole of Berkeley's reasoning. But it is my experience that the vast majority of highly educated people have *no* such familiarity, and that it is very difficult even to get them to understand it; for some eminent philosopher has admitted that Berkeley "proved to demonstration what no man in his senses can believe." The most whole-hearted Idealist can never wholly rid himself of the belief that there is a something underlying all the physical objects of nature, although he has no evidence of it whatever.

I cannot agree with the lecturer that "the day of the old materialism is gone for ever." A few scientists (who are also philosophers), backed up by certain psychical societies, are emphatic in welcoming the miraculous in nature, and the existence of a spirit world around us; but the vast majority of scientists, never having troubled themselves to master Idealism, are busied only with material things, and regard "matter," and the laws that govern it, as the only thing that is immortal. Dr. McCrady himself says (page 113, line 10, *et seq.*) "that sober, philosophical minds should be misled, at this late day, into all the ramifications and hair-splitting subtleties of Neo-Realism, Critical Realism, etc. . . . is, indeed, amazing."

I fully share that surprise; for when I first mastered Berkeley's argument I felt confident that, the foundation being gone, the materialistic cult must sooner or later collapse; that, in fact, all that was required was a widespread knowledge of the argument for Idealism. But, on the contrary, the spread of Evolution, and the eager study of all the physical subjects to which that gave rise, has, in my opinion, given a tremendous impetus to materialism.

Berkeley, as Dr. McCrady reminds us, makes no claims to having any *direct* experience of spirits other than his own; "Every man directly intuits his own ego; but no man directly intuits the soul of another."

This, to me, is Berkeley's weak point; and I cannot help thinking that he is quite wrong. This is what Hume seized on, to argue

that no individual man is conscious of the existence of any being but himself: that all other persons, all other animals, may be nothing more than automata; that my knowledge of the minds and souls of other people, and of God Himself, is a mere matter of inference, and not of knowledge.

This reduction of Idealism to the hopeless scepticism of Hume has alienated the Evangelical world from Berkeley, and caused him to be boycotted or ignored by those who ought to have known better. For Berkeley, a pioneer missionary, a God-fearing man, was one of the noblest characters our country ever produced. To him, Pope (a Roman Catholic) attributed "every virtue under heaven." I contend that our spiritual nature *is* in direct contact with other spiritual beings, both good and bad, both human and divine. This is what I find in Scripture, and what can be proved by the experiences of life. To reason out these premises, however, would demand far more time than is now at my disposal.

We are indebted to Dr. McCrady for bringing this important subject before us.

The Rev. H. C. MORTON, B.A., Ph.D.: This paper is very fully in harmony with our title of Philosophical Society; but whilst I have read, and have also listened with much interest to, Professor McCrady's Paper and note the strong conviction which characterizes it, I cannot pretend to agree with it for even one single moment. Realism has always been regarded as the Biblical type of Philosophy; and the longer I consider Idealism, the more convinced I am that Biblical affinities are not to be sought there.

Professor McCrady's contention is that the world of existence consists in its being perceived by some consciousness, either mine or another's. Here are his words:

> "Berkeley denied . . . the existence of . . . a world whose being did not consist in its being perceived by any consciousness whatever": and again in full keeping with this:—
>
> "*Existence* is only a name which we have given to *a certain experience of our minds—i.e.*, a certain *mental* fact or datum" (p. 115, note).

I want this position to be quite clear; because as soon as it is clear it will be rejected unhesitatingly by all except one person in a million. The Idealist is continually guilty of passing without a vestige of proof from the proposition that "A thing exists in thought," which of course is true, to the proposition that "the thing exists *only* in thought," which is an absolutely different matter. That is a proposition drawn, not from our primary authority, consciousness, but from a long process of sophistication, and takes us all out of the world we know into a sort of Christian Science nightmare.

Five minutes is a very brief portion of that great objective reality called Time, but I think it may be possible to test this Subjective Idealism by three tests: 1, the existence of God; 2, the universal consciousness of mankind; 3, the statements of the Bible, to which the Professor appeals.

1. Idealism fails to give any place to the real external existence of God. It says that there is no existence outside thought, and thus makes God's existence depend upon the thought of God. I remember the statement in the classroom, "Having thus shown the genesis of the material world, next time I will proceed to generate God." But between God and the thought of God there is all the difference in the world.

2. Idealism is contrary to the universal experience of mankind. Always, and inescapably, that universal consciousness is a consciousness of the subject who thinks and of the object that is thought. Moreover, I myself, who think, am an existence quite apart from my thought about myself. Berkeley, if he were logical, would have taken the position Hume took, viz., that the only things which exist in the universe are mental states. He should have concluded that "Thought is the only Being," as Hegel affirned. But Berkeley, having said that existence is only a name for a certain experience of our minds, went on quite illogically to admit the existence of both himself and of other minds or selves—as distinct from those mental experiences.

It is not admissible for the Idealist first to claim states of consciousness as the only real existence and then go on to deny the validity of those states of consciousness which are practically universal, which declare that I am a being on the one side, and that there is an external world of real spiritual beings and real material

things upon the other side, continually affecting me in a great variety of ways. The Idealist cannot first appeal to consciousness as the one reality and then refuse to accept the most universal affirmation of that consciousness.

3. The Bible will not allow the Idealist to "get away with" the idea that existence is simply a state of somebody's mind. The Professor quotes Gen. i, 1; but read on

> And the Earth was without form and void, and darkness was upon the face of the deep: and the Spirit of God moved upon the face of the waters.

Can anyone really claim for one moment that these existences, viz., the Earth, Darkness, the Spirit of God, and the Waters, all are just states of consciousness? Most surely here, as everywhere in the Bible, we have just what the Idealist denies, viz., God upon the one hand and the material external world upon the other. The Spirit of God did not move upon the face of one of God's thoughts. The Bible uses language which confirms the universal consciousness of mankind.

Idealism is a long process of sophistication, which robs us ultimately of everything that exists except what is philosophically called the Absolute. *Why* does it do this? *Cui bono*? For my part I hold to that "primordial common sense which believes in a world that exists independently of the knowing of it."

Mr. W. E. Leslie wrote: I am glad that the Council has included a paper from the Idealistic standpoint, not only because it is desirable that various points of view should be represented but also because I believe it to be correct. The paper is somewhat technical. Perhaps the fact that it lays great stress on considerations which to many will appear to be purely verbal, is due to the author's assumption that the speculations of mathematical physicists are more widely known than is actually the case. While these speculations have had a strongly Idealistic tendency, the empirical atmosphere of the last century has produced a widespread feeling that purely verbal considerations belong to the bygone age of the Schoolmen. The word "Substance" toward the end of the paper is presumably used in a highly technical sense. A different expression might save misunderstandings.

Author's Reply.

I confess to no little feeling of surprise in being called upon to reply to the two foregoing criticisms of my paper. I say the *two* foregoing criticisms, for I understand from the remarks of Mr. Leslie that he is in substantial agreement with my position. I do not mean to imply that the criticisms in question are at all new or strange to me. Indeed, forty years of teaching and lecturing on the subject of Idealism has made such objections a familiar experience, but I must confess I was not looking for criticisms of this kind from such a quarter.

The difficulty of replying to such objections is strikingly like that which a man encounters in attempting to explain the point of a joke to a friend devoid of humour, or to make plain the meaning of music to one who has no music in his soul. I do not say this in any unkind spirit, as I am quite sure these gentlemen mean well and are thoroughly convinced of the truth of their respective positions. Yet it remains a fact the essence of the argument lies in a series of propositions which should be *self-evident*. When, therefore, these basic propositions are quietly ignored by my critics and other premises, for which I am not responsible, substituted therefor, the conclusions deduced may be fascinatingly interesting, but they have nothing to do with my argument. What these gentlemen are overthrowing with such convincing logic is not my conception of Idealism, nor that entertained by Berkeley, but one of their own construction. It is needless to say that criticisms of that kind do not affect me in the least.

Furthermore, in carrying out this method of procedure, they have even gone so far (in a number of instances) as to credit me with opinions which I do not only disavow but which (as a careful review of my paper will testify) I had taken considerable pains to disavow in the very article under discussion. For example, Mr. Forbes urges, as against the views of Berkeley and myself, that even "the most whole-hearted Idealist can never wholly rid himself of the belief that there is something underlying all the physical objects of nature, although he has no evidence of it whatever"—as if either Berkeley or I ever denied the existence of such a "something." Why, if there is any one thing that I have laboriously

sought to establish in this very paper, it is the genuine reality of that "something." To quote only one of my many statements—"He (Berkeley) never for one moment denied that there was a real *Substance* underlying the phenomena of nature. He only denied that there was, or there could be, any substance to such a phenomenal world *other than conscious Will or Spirit*; and for any Christian man to deny that proposition is to deny the plainest statements of Holy Writ. It is the Materialist with whom Berkeley is dealing, and he tells him that an underlying Substance there certainly is, but it is a *Spiritual* and not a *Corporeal* Reality. It is a *Spirit*, not just one more block of *Matter*." (q.v.) See also all that follows and much that precedes this quotation. Surely I am not called upon to justify my argument to a critic who has not taken the trouble to acquaint himself with some of my most explicit statements.

In like manner, Dr. Morton asseverates that "Idealism fails to give any place to the real external existence of God." What Idealism is he talking about? Certainly not the Idealism I am here advocating nor that advocated by Berkeley. The statement already quoted (*supra*)—to say nothing of many other passages in my paper—abundantly refute such an assertion. Suffice it to say I do most emphatically assert the *objective, external, transcendental* relation of God to the world; but, in so doing, I also as emphatically assert His *immanence* in Nature—especially in the hearts and lives and bodies of men. ("Know ye not that your body is the temple of the Holy Ghost which is *in* you?"—I Cor. VI, 19. Also numberless other references to the Divine Spirit dwelling *within* us.) Nor is there any contradiction here. For God is neither *excluded* ("shut out of") the world that He has created nor, on the other hand, is he *imprisoned* helplessly within it. He is both immanent and transcendental, both within and without ("external to") his world. In short, God is all in all. "In Him we live, move, and have out being." Not only do I hold that as a religious conviction but my Idealism abundantly confirms that belief. And here I may add that if there is any question involved in Berkeley's launguage on this point at all, it relates to the "immanent" rather than the "external" Deity.

Again, assuming that Berkeley taught, as a central principle, that all our experience was limited to our "ideas," and their logical

combinations (*i.e.*, "thoughts"), Dr. Morton has again reasoned ingeniously (though by no means originally) to the conclusion that since the experience of "thought" alone can never carry with it the experience of a "Thinker" or "Subject" (?), the Idealism of Berkeley fails to establish the existence of God. Put in another form, since "existence," with Berkeley, is a property of "ideas" alone, it can never be predicted of a Subject or Thinker as distinct from his thought. All this *a la* Hume. Now the only trouble about this otherwise most interesting and ingenious theory is that *it is not true.* Berkeley does *not* limit existence to "ideas" but to mental experience in general, in which category he expressly includes the direct "notion" of Spirit. He distinctly asserts (*see Prin. of Knowledge*, Sect. 27, and elsewhere) that in addition to our ideas or thoughts, we have also "notions" of Will, Soul, Spirit, etc., and it is from this *direct experience* of the Spirit within that he reasons to the existence of other "Spirits" than his own, as well as to the existence of a Supreme Spirit—*i.e.*, God. Although I have devoted considerable space to the elucidation of that view of Berkeley, my critic does not seem to be aware of the fact. He prefers to answer my argument by ignoring my premises altogether, and substituting some of his own.

Yet this whole difficulty would have vanished, had he thought somewhat further on this point. The experience of the human Self or Spirit—unlike the experience of an "idea"—is synonymous with the experience of a *Self-conscious Being*—that is a Being (Existence) conscious of itself—hence (for that reason) "*self-existent.*" *Chronologically*, there is no priority of the *consciousness* of such a Spirit to his *being* or *existence.* His consciousness and his existence, though logically distinct, are chronologically inseparable and co-existent, even as the three Persons of the Trinity, though logically distinct, are co-eternal. In a word, *Being cannot exist without Consciousness nor Consciousness without Being*, although it is only in the case of our direct experience of Spirit that this truth is fully revealed. Self-conscious Spirit is the only self-existent being there is—all other "orders of reality" (note what I have said on that subject) being dependent for their existence upon other "Selves" or Conscious Spirits. In short, the difference between the "being" of a Spirit, and the "being" of an "Idea" ("Thought")

is that the one is "*Being per se*" the other "*Being per aliud*"—an expression which we owe to Spinoza (Axioms I and II), but which, in its idealistic implications, has been chiefly developed by Hegel. Appreciation of this principle altogether removes the enigma which so perplexes Dr. Morton, and so makes his supposed objection inapplicable in this connection.

Much more might be said in reply to this and other similar objections. The truth is, however, that back of all this, lies the failure of my critics to appreciate the significance of that fundamental principle which is the *sine qua non* of all true Idealism—viz., that all that Science, Philosophy, Religion, or any other form of human inquiry is concerned with are the actual facts of human experience; and since all experience is *conscious* experience, all these facts are *data of consciousness—mental facts*. The very words we use, in all our discussions, refer to these *mental* facts or they refer to nothing at all—that is, are without meaning. To talk about "things," "entities," "realities," different in kind from *mental experiences*, then, is only to talk about "things," "entities," and "realities," different in kind from any that we mean by the words themselves. The word "Matter" is no exception to the rule. What we refer to in using it is a *mental experience*. Even Huxley admitted that "'Matter' and 'Force' are, so far as we can know, mere names for certain forms of consciousness." (*Lay Sermons: Descartes' Discourse*, p. 340.) Until our critics can invalidate that self-evident proposition, all further argument is useless; and, I may add, until they fully appreciate its meaning, together with the logical implications which it involves, they will never see what Berkeley is talking about.

Finally, let me say that I am not here interested in the defence of just any system of Idealism that may be suggested for discussion but only in that advocated by Berkeley. I heartily agree with my critics that there are many conceptions of Idealism that are logically indefensible. Those very conceptions which they are here attacking I include among the number. But inasmuch as they represent neither the view of Berkeley nor my own, I am not concerned in answering them. They have no bearing upon my argument.

I see nothing, therefore, in the above criticisms which call for further serious consideration. They are built partly upon mis-

interpretations of Berkeley's position—partly upon misunderstanding, and, to some extent, disregard of my own statements—and partly again upon a lack of familiarity with the great work that has been done by specialists in this department of philosophical research.

This last statement also suggests another matter to which I must briefly allude before closing—viz., the singular failure of many people to appreciate the tremendous revolution that has taken place in the world of Physics within the past few decades, resulting as it has in the complete repudiation of the old Materialism. I spoke briefly of this matter in my paper. From his comments on this statement of mine, in which he speaks of "a few scientists . . . backed up by certain psychical societies . . . welcoming the miraculous in nature," etc., it appears that Mr. Forbes has completely misunderstood to whom I was referring. Let me say at once, therefore, that I was not there alluding to the members of the S.P.R., or any other similar organisation, but to that long array of modern chemists, physicists, mathematicians, astronomers, etc., who, since the epoch-making discoveries relating to Radio-activity, the electrical constitution of matter, the doctrine of Relativity, etc., have completely changed their attitude toward the whole materialistic philosophy of the past. I am very far from insinuating that men like J. J. Thomson, Oliver Lodge, Einstein, de Sitter, Whitehead, Millikan, Jeans, Eddington, and hosts of other recognised authorities have all suddenly turned Berkeleyan Idealists overnight. Such a statement would be absurd. But I do venture to assert that they are all practically unanimous in the opinion that "the old Materialism is dead"; and this being the case, some kind of idealistic conception of the universe is the only logical alternative—an opinion which is now widely entertained. But, again, if this be true, it means also that every form of so-called "Realism" which, repudiating the axioms of Idealism, attempts to build anew on the foundations of the old Materialism is likewise doomed to perish.

787TH ORDINARY GENERAL MEETING

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, MARCH 11TH, 1935, AT 4.30 P.M.

MISS CHRISTABEL PANKHURST, LL.B., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed, and the HON. SECRETARY announced the election of the Rev. H. M. Webb-Peploe, O.B.E., as an Associate.

The CHAIRMAN then called on Sir Andrew Taylor, J.P., F.S.A., who had kindly offered to read Dr. W. Bell Dawson's paper on "Solar and Lunar Cycles Implied in the Prophetic Numbers of the Book of Daniel."

PROPHETICAL NUMBERS IN DANIEL, IN RELATION TO CELESTIAL CYCLES.

By WILLIAM BELL DAWSON, M.A., D.Sc., F.R.S.C., Gold Medallist, Institution of Civil Engineers, London, Laureate of the Academy of Sciences, Paris.

IN considering this matter, we may need to realise that what God has revealed to us in His word is related to His works in ways which may not be obvious without some study. This is especially true regarding references in Scripture to the heavenly bodies, the sun and moon. For these not only give us day and night, the seasons of the year, and the tides of the ocean, but they were appointed from the first to measure off time in definite periods of the day, month, and year, as well as in longer cycles in terms of these. Such time-values are necessarily related to man, who dwells in time and space; and this is included in the comprehensive statement, that God "made

from one forefather every nation of men to dwell on all the face of the earth; having defined for them their appointed periods and the bounds of their habitation." (Literal Greek in Acts xvii, 26.) The extent and duration of kingdoms and dynasties is thus providentially limited; and this is revealed to the Prophets, so far as they concern the people of God, by the periods predicted in their prophecies; which deal especially with the limitation of evil in its various aspects in different ages.

The counting of time.—From the earliest days, man has felt his need of what we now call a calendar system, by which to follow the seasons of the year and to correlate the day, month, and year with each other. To this endeavour he devoted the high intelligence with which he was originally endowed; for the problem was not an easy one, since the year does not contain a complete number of natural lunar months nor an exact number of days; but both involve fractional values. He soon found that these three time-measures could only be correlated by determining longer cycles, or groups of years into which an exact number of months would fit, or a series of months in which there was a whole number of days without a fraction. It was thus only by making use of these longer cycles, that a workable calendar system could be devised. Our present purpose is to show that such cycles, deduced from the prophetic numbers in the Book of Daniel, have a far higher accuracy than any which man has otherwise been able to obtain by his own wisdom.

This subject has in reality a wide interest. For calendar systems which enable the months and the seasons to be known in advance, were devised to enable food supply to be obtained from crops, and to provide beforehand for suitable clothing. There is also an interest for all who are at all acquainted with astronomy, in exact cycles for the position of the sun and moon. But the main appeal is to the Bible student who desires to follow the march of the purposes of God in successive ages, and the accomplishment of His promises when "the time is fulfilled." For we find throughout Scripture that a limit is set in the providence of God, to the continuance of evil times; such as the Servitude in Egypt, the Wandering in the Wilderness, the Captivity in Babylon. The prophetic announcements by which these were limited were made in terms of days or years that are in reality the times of revolution appointed by the Creator for

the heavenly bodies. May we not perceive divine foresight in similar prophecies, predicting periods for the fulfilment of God's wider purposes towards His people, if they likewise embody still longer cycles, astronomically related to the movements of these heavenly bodies ?

To understand our subject comprehensively, we may refer as briefly as possible to the aspects above indicated; though we cannot here go beyond the various cycles themselves to any interpretation of them in prophecy or in history.

Primitive endeavour.—One of the earliest needs of man, as he spread over the earth, was to fix a point in the year in relation to the seasons; to know when to sow and plant, when to expect the rainy season, when a river such as the Nile would be in flood. Moonlight also was of value in prolonging the light of day for the agriculturist or the traveller. The first step, then, was to have a fixed point in the year to start from; and to measure in days the length of the year and the lunar month. This achievement was no theoretical research but a very practical matter; which may well account for the early attention given to astronomy.

In all countries, the point at which the sun rises and sets shifts along the horizon with the seasons. From this change in the point of sunrise, the length of the year can be found anywhere where there is a wide view of the horizon to the eastward, as there usually is in Babylonia and Egypt. From any position selected, some natural mark is noted on the horizon at which the sun rises; and the days are counted until (at the same season in the following year) it rises again at the same point as before. It would soon be found best to select special points on the horizon, marked by a line of sight; either near the Equinox when the shift at sunrise is most rapid, thus giving the result readily with greatest accuracy, or at the Solstice when the point of sunrise reaches its northern limit and the day is longest.

These methods were carried out with great elaboration in Egypt, where the temples are set truly to the Equinox or to the Solstice, and thus form masonry telescopes for the purpose. In outlying lands, stone circles such as Stonehenge were erected, showing the same need everywhere. These structures may also have been associated with sun worship, when at the longest day the sun reaches its triumph over the darkness of the night.

It would thus appear simple to count the days in the year, and to fix the same day in the circle of the year. But in the first three years there would be a slight shifting of the sunrise from the line of sight, and only on the fourth year would it occur again precisely at the point indicated. The four years would count up to 1,461 days; showing that each year should properly be 365¼ days. It is to be noted that this could be ascertained by only four years of observation. There is also good evidence that the ancients knew the length of the year much more closely than this.

The length of the lunar month was a matter of much greater difficulty. The actual new moon cannot be seen, and it is quite difficult to estimate just when it is full. But at the quarters, the time when there is exactly a half-moon can be noted almost to the nearest hour; and the length of the month can thus best be found between the similar quarters. But the trouble is that the motion of the moon is not uniform. It moves faster when it is nearest the earth at Perigee and slower when farthest away at Apogee. Also, the phase of the moon at which Perigee occurs is continually changing, during the course of the year as well as in a longer period. Because of these complications, the length of one lunar month may differ from another by more than seven hours.

Notwithstanding these inequalities, long and patient observation enabled the average length of the lunar month to be determined with remarkable accuracy. We may well pay tribute to the very ancient inhabitants of Babylonia for their careful astronomical observations and records, and their knowledge of eclipses; on which much might be said. They were followed closely by the Persians and Arabians, but much of the credit given to the Greeks is now known to be borrowed from earlier peoples; and the Romans showed little of the exalted astronomical ideals and careful exactitude of their predecessors.

For our present purpose, we can limit our astronomy to the three periods: (1) The solar year, technically known as the "Tropical year," being the period in which the sun circles the heavens from one vernal equinox to the next, as this corresponds with the seasons; (2) the lunar month, from new moon to new moon, which astronomically is the "Synodic month"; and (3) the day, properly termed the "mean solar day," by which the length of the other periods is measured.

Types of Calendars.—To be systematic, we must now take up the various types of calendar, and the degree of accuracy which they exhibit, for comparison with the results derivable from the Book of Daniel. For all calendar systems are based upon cycles related to the primary time measures, which place them on the same footing as the astronomical cycles implied in the numbers in Daniel.

It is extremely interesting to look into the various methods by which different nations have dealt with the reckoning of time. They all had before them the same natural measures; the day, the month of the moon, and the year of the seasons; and yet they have adopted every possible type of calendar. The highest ideal is found earliest; namely, to keep the year fixed in its place in the seasons and yet to retain the natural month, which makes the moon always new on the first day and full on the middle day. We are so unaccustomed to this idea that we may not appreciate the advantages it has for the farmer, the traveller, the fisherman, the mariner, and all who live close to nature. For the gathering of sea food, on which many peoples largely depend, the lowest tides and the widest beaches are at new and full moon. We may therefore admire the persevering endeavour of old to bring the revolutions of the sun and moon to a precise system, so that the lunar month might be incorporated in the yearly calendar.

The ancient Hebrews achieved this object by a method which at least could never go wrong. Their system can be reduced to this simple rule: "The first day of the First month shall be at the New moon which is nearest the Equinox in spring; that is, within 15 days before or after it." The full moon of the Passover will thus always be at the middle of the First month.* In carrying out this rule, a thirteenth month had to be added to the year when necessary. The necessity arose because the twelve lunar months fell short of a full year by 11 days; and there came to be a gap between the end of one year and the

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* Hales, in his *Analysis of Chronology*, states that almost universally, amongst the old nations, the year began at the vernal equinox. The Egyptians were an exception, because the Nile attains its highest near to the autumnal equinox. At the Exodus from Egypt, the Lord enjoined that the year should begin in its rightful place with the spring month. (Exodus xii, 2.)

beginning of the next, which had always to begin near the equinox. It is clear that this extra month would usually come every third year; but on this there was no fixed regulation, for the adjustment was automatic. So, by simply keeping to the rule, the months remained closely at the same season of the year, for all time.

We may contrast this with the highly astronomical method of the Chinese to reach the same end, with a calendar also retaining the lunar month. Their rule is that if two New moons occur while the sun is passing through any one Sign of the Zodiac, an extra month is to be added to the calendar. This system not only requires advanced astronomical knowledge and accurate calculation, but it has a serious practical disadvantage. For the motion of the sun among the stars is slower in summer than in winter; and the sun then takes longer to traverse one of the divisions of the zodiac. It follows that the extra month usually falls in summer in the middle of the year, instead of always at the end, as with the Hebrew method.

There were other nations who made choice between the sun and the moon, and based their calendar exclusively on the one or the other. There are thus two other possible types of calendar, the lunar and the solar. The lunar calendar comes into prominence in the seventh century, and has been used by the Saracens, Turks, and other Mohammedans until quite recent times. In it the year consists of twelve lunar months; and it thus comes short of the full solar year. Hence the beginning of the year falls gradually back through the seasons, which is inconvenient. Yet the accuracy of the calendar itself is extraordinary, especially considering that any error in the length of the lunar month is multiplied by twelve in making up the length of the lunar year. The " lunar year " is also of outstanding importance in connection with the cycles we have to consider.

The endeavour to retain the lunar month in the calendar was continued by the Greeks, but was finally given up by the Romans. This has led to a purely solar calendar, to which we are accustomed. Astronomically it is very elementary; for it merely fixes the position of the first day of the year, which the most primitive peoples can do, as we have seen; and the year is divided into twelve sections called months, neither regular nor systematic, and without relation to the moon which earlier nations made such effort to maintain. Yet the need for the moon

asserts itself, when one feature of the Hebrew method is grafted in, awkwardly enough, to bring Easter into a system otherwise solar. We need not wonder at suggestions for the reform of so crude and inconsistent a type of calendar.

Comparison of cycles.—With these types of calendar before us, we can proceed to examine the amount of error in the cycle-values on which they are based, for comparison with the cycles derived from the prophetical numbers in Scripture. By the method of comparison adopted, we can show their relative accuracy in a simple way and on a uniform basis. The accuracy of the Daniel cycles is so high in relation to the most accurate modern determinations of the year and lunar month that we need to take into account the least variation in the length of these, during the course of the centuries, known as "secular acceleration." The need to consider this emphasises the extreme accuracy of the cycles themselves; as such a refinement has never been contemplated nor provided for in any calendar system.

The cycles to which we refer are based on the two leading prophetic numbers 2300 and 1260. The latter of these is styled in the Book of Daniel, "time, times, and a half," an expression explained in Revelation as meaning 1260 "days," corresponding with the prophetic "time" of 360.* It has been shown by a series of investigators during the last two centuries that if these numbers are taken as years, they constitute cycles of astronomical importance; and from them again, cycles of the highest known accuracy can be derived. Professor T. R. Birks of Cambridge, in his *First Elements of Sacred Prophecy* (1843), has discussed this matter fully, and cites earlier authors as far back as 1700, who perceived its significance. The present writer, in carrying this work forward, has discovered that a cycle can be deduced from these numbers which correlates the solar year with the complete lunar year, by a simple arithmetical relation. These prophetical numbers thus embody a cycle of the highest type which is possible in this whole domain, and surpasses all others in accuracy.

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* *See* Daniel viii, 14 and xii, 7, 11 and 12. The "time, times, and a half" is followed by 1290 and 1335, indicating that it is shorter than these; and thus according with 1260 as explained in Revelation xii, 6 and 14.

Before proceeding to the cycles that underlie the various calendar systems, we must give the best modern data for the length of the solar year and the lunar month.

Data for the sun and moon, at the Epoch A.D. 1900.—The value for the length of the year now adopted by astronomers is the determination by Simon Newcomb, who revised all the data for the solar system. It is (in days) 365·24219879 in 1900; for the length is decreasing by a little over half a second per century. This is the year of the seasons, or the "Tropical year" from equinox to equinox. In the decimal of a day, one second is represented by the fifth decimal place; the above decimal thus showing that the length of the year is now known to less than the hundredth of a second.

The lunar month which concerns us, is the visible month of the moon's phases, named the "Synodic month." The value accepted for this by astronomers is the revision by Dr. E. W. Brown of Yale University, namely (in days), 29·53058818 at the Epoch 1900. The "lunar year" of twelve lunations is therefore 354·3670582 days, which, being derived from the month, cannot be carried to further decimals. There is a slight decrease in the length of the month, estimated in centuries, due to the "secular acceleration" of the moon.

As the Daniel cycles reach the limits in the accuracy of our data, it is essential to ask whether the day itself is truly constant in length, or, physically speaking, whether there is any progressive change in the rate of rotation of the earth. For the day is the unit of measurement, and if any continuous alteration in its length was appreciable, there would be an apparent change in all the time elements throughout the solar system, as stated in days; and of this there seems to be no evidence. We may assume, therefore, that the length of the day is constant; or at the least that it has been so during the last twenty-five centuries since the time of Daniel. For we are not discussing theoretical changes in geological time extending over millions of years. Because of the importance of this matter, however, we append a technical note upon it; from which it will be seen that the various forces, known to influence the earth's rotation, act in opposite directions; and any residuum must be very minute. (*See* Note A.)

We may now consider the various cycles and their accuracy, on a uniform system of comparison; taking them up in a

rational order, beginning with the relation of the day to the year and month.

I. *The solar year and the day.*—The Julian year of 365¼ days is represented by the cycle 4 years = 1,461 days; for according to it there is a leap year uniformly every fourth year. This gave rise to an accumulated error in course of time; and the Gregorian year, devised in the sixteenth century, improves upon it by suppressing three leap years in four centuries. It is therefore represented by the cycle, 100 years = 36,524¼ days, or in the four centuries, 400 years = 146,097 days. The accuracy of these systems at the epoch A.D. 1900 (to which we are reducing them all) is as follows:—

		Error per century.	Error of one day in:—
Solar year ...	... 365·2421988		
Julian year ...	... 365·2500000	0·78012 day.	128 years.
Gregorian year ...	... 365·2425000	0·03012 day.	3,320 years.

As this calendar system requires 400 years for its complete adjustment, the accuracy here indicated will not be reached until the fourth century after A.D. 1582 when it first came into use in Europe; and its adjustment has not therefore been completed as yet.

II. *The lunar year and the day.*—We here meet with the first of the cycles based on the prophetic numbers. The "1,260 days," stated in Daniel as "3½ times" and explained in Revelation, is evidently half of the complete period of "seven times;" as seven represents perfection in Scripture. Accordingly, the double of 1,260, or 2,520 is the measure of this whole period.

If then the "days" mentioned in these prophecies are taken to be symbolical of years, we discover that the period of 2,520 lunar years contains an exact number of days, and is thus indeed an astronomical cycle of a high order. It can also be further reduced to a period of 504 lunar years. On the symbolism of a day for a year, on which such cycles depend, the following remark is made by Moses Stuart, Professor of Sacred Literature from 1810 to 1848 at Andover Seminary, afterwards affiliated with Harvard University: "It is a singular fact that the great

mass of interpreters in the English and American world have, for many years, been wont to understand the days designated in Daniel and the Apocalypse as the representatives or symbols of years. I have found it difficult to trace the origin of this general, I might say, almost universal custom." This usage must have been helped forward a century earlier by Sir Isaac Newton. For in explaining the symbolical actors in the drama of prophecy, he takes "the days of their acting, for years." (*See* his *Prophecies of Daniel and the Apocalypse*, 1733; reprinted 1922, page 152.)

In this instance we have, with the value adopted :—

Lunar years $2520 \times 354 \cdot 3670582 = 893004 \cdot 9867$ days;
or $504 \times$ do. $= 178600 \cdot 9973$ days.

This comes within 4 minutes of a complete number of days in the five centuries; and if we reverse the process, by assuming the cycle, 504 lunar years = 178,601 days, to be exact, we find the following values for the lunar year and month, which we term the "cycle-values" :—

$\frac{178{,}601 \text{ days}}{504} = 354 \cdot 3670635$ for the lunar year;
and $29 \cdot 53058862$ for the lunar month.

The month thus resulting, differs only four-hundredths of a second from the most recent modern value already stated. Further, as the lunar month has been slightly longer in the past, the cycle is even nearer perfection in previous centuries than it is now.

Mohammedan calendar.—This calendar is purely lunar and thus comes properly under this heading. Its use became widespread through the Saracen conquests of the seventh century; but it may have been more ancient. It is in such remarkable agreement with the lunar cycle above explained that it would almost seem that its originators must have known that cycle. This is by no means impossible when the calendar is Eastern in origin; because, from the Persian point of view, Daniel was one of their own statesmen, and they must have been acquainted with his writings. These might well have given them the clue, when Eastern peoples were always keen to discover astronomical cycles. We make this suggestion to account for the high accuracy

of this calendar, and because its basis can be deduced from this cycle by the process following, if the cycle were known.

The cycle is 2,520 lunar years = 893,005 days. The number 2,520 is highly divisible, which is characteristic of prophetic numbers; but the number of days has no factor but five. But by deducting one day, or admitting an error of a day in the 2,520 lunar years, the number becomes divisible by 12 and 7, and the period can be reduced to a cycle of thirty years, thus :—

$$30 \text{ lunar years} = \frac{893{,}004}{12 \times 7} = 10{,}631 \text{ days};$$

and consequently one lunar year $= 354\ \frac{11}{30}$ days. Each year of 354 days can therefore be divided into months of 29 and 30 days alternating evenly; and during the cycle of 30 lunar years, 11 intercalary days are required. It is remarkable that this is precisely the adjustment we find in the Mohammedan calendar. The error in this calendar, at the Epoch 1900, is as follows :—

	Error per century.	Error of one day in :—
Lunar year, Epoch 1900 = 354·3670582		
From cal'r cycle, $354\ \frac{11}{30}$ = 354·3666666	0·04035 day.	2,478 years.

This accuracy within one day in 2,478 years is one day in 2,554 lunar years; and it was the near coincidence of this period with the number 2520 which first drew the attention of the writer to the cycle above described. Compared with the Gregorian calendar, this accuracy is quite outstanding, in view of the greater difficulty of determining the lunar year correctly; and further, when the adjustment of intercalary days is completed within 30 lunar years, instead of requiring four centuries.

III. *The solar year and the lunar month.*—A common measure for these periods was early sought as a basis for a natural calendar, in which the year and lunar month could both be preserved. There are two well-known cycles which serve this purpose. In the Metonic cycle, 19 solar years = 235 lunar months or lunations; the series of months giving a total of 6,940 days for its period. The Calippic cycle made a correction on this by deducting one day in four Metonic cycles, or 76 years. It thus

has 76 years = 940 lunations; with a total of 27,759 days in that period. This cycle also corresponds more closely with the anomalistic month of the moon's distance; so that the more rapid motion of the moon is again in the same position in relation to its phases. This brings the hour of the new moon at the beginning and end of the cycle into better accord with observation. The following are the actual lengths in days which these cycles have :—

Metonic.—

Solar years $19 \times 365 \cdot 2421988 = 6{,}939 \cdot 6018$ days.
Lunations $235 \times 29 \cdot 5305882 = 6{,}939 \cdot 6882$ days.

Calippic.—

Solar years $76 \times 365 \cdot 2421988 = 27{,}758 \cdot 4071$ days.
Lunations $940 \times 29 \cdot 5305882 = 27{,}758 \cdot 7529$ days.

The advantage of the correction made by the Calippic cycle becomes evident when both cycles are reduced to any period of the same length. The two best comparisons to be obtained from these cycles are the relation of the solar year to the lunar month as given by either of them and the relation of the lunar month to the day as given by the Calippic cycle. (The Metonic cycle with 19 years equal to 235 lunations gives 29·5302203 for the synodic month; and the other, with 940 lunations equal to 27,759 days, gives the value 29·5308511.) The accuracy of these "cycle values" is here shown :—

	Error per century.	Error of one day in :—
Lunar month (1900) ... 29·5305882		
Metonic cycle.		
Cycle value (as above) ... 29·5302203	0·4550 day.	220 years.
Calippic cycle.		
Cycle value (as above) ... 29·5308511	0·3251 day.	308 years.

We have seen the outstanding superiority of the relation between the lunar year and the day, as brought out by one of the prophetic numbers; and in the correlation of the lunar month with the year, which earnest minds strove to achieve through the above cycles, we now reach a transcendently more accurate solution deducible from the numbers revealed in

Scripture. We may thus realize that as the heavens are higher than the earth, so are the thoughts of the Creator higher than our thoughts, in all that man has been able to devise for his reckoning of time in his calendar systems.

A systematic investigation of the whole subject of cycles is given by Professor Birks in his work already referred to. He points out that the prophetic "month" of 30 years, as well as the "time" of 360 years composed of twelve such months, has a scientific character. He goes on to explain the discovery of a Swiss astronomer, M. De Cheseaux, in the eighteenth century, who found that the numbers 1,260 and 2,300, taken as solar years, proved to be strikingly correct soli-lunar cycles; and as their small outstanding errors were almost the same, he inferred that the difference of these periods, or 1,040 years, should be a perfect cycle. This is given in *Mémoires posthumes de M. De Cheseaux*, published by his sons in 1754. Yet, as Dr. H. Grattan Guinness remarks in his explanation of the matter: "It is a fact full of the deepest interest to the Christian mind, and which has never received, either at the hands of the Church or the world, the attention that it merits." (*See* discussion by Guinness in *The Approaching End of the Age*, 13th Edition, 1897, pages 399 to 406.)

These points, as well as the high accuracy, will be clearly seen from the following figures, when the cycle is stated in days:—

Solar years $1040 \times 365 \cdot 24219879 = 379{,}851 \cdot 8867$ days.
Lunations $12863 \times 29 \cdot 53058818 = 379{,}851 \cdot 9558$,,

The error in the complete number of lunar months contained in the 1,040 years is thus only 0·0691 of a day, or less than 2 hours in over 1,000 years. The value of the lunar month given by the cycle (found by dividing the days in 1,040 years by 12,863 months), and also the error of the cycle, is here shown. The error is less than half a day in the whole human period.

	Error per century.	Error of one day in:—
Lunar month—		
Epoch 1900 = 29·53058818		
Cycle value = 29·53058281	0·00664 day.	15,056 years.

Upon this, De Cheseaux himself remarks: "This period of 1,040 years, indicated indirectly by the Holy Spirit, is a cycle

at once solar, lunar, and diurnal of the most perfect accuracy. . . . A cycle of this kind had long been sought in vain; no astronomer or chronologist had been able to light upon one; and yet for two thousand three hundred years there it had been, written in characters legible enough, in the Book of Daniel: legible, that is, to him who was willing to take the trouble of comparing the great prophetic periods with the movements of the heavenly bodies—comparing the book of nature with the book of revelation." He gives to this cycle the name of the *Daniel Cycle*; and after further discussion he thus concludes: "Is it possible, considering all these points, to fail to recognise in the Author of the Book of Daniel, the Creator of the heavens and all their hosts, of the earth and the things that are therein?" This remark evidently applies with equal force to the other two Daniel cycles here under consideration.

IV. *The solar year and the lunar year.*—We here reach the highest possible type of cycle, which rises above the months, and makes a complete number of lunar years exactly equal to a definite number of ordinary years. It is thus a period in which a series of lunar years (of 12 lunations) will begin and end exactly with the solar year. Such a cycle could only be obtained from the prophetic numbers.

It occurred to the writer that instead of the method adopted by De Cheseaux, this higher result could be obtained by taking the numbers 2,300 and 1,260 in the prophecies to represent lunar years; and it was then discovered that in the corresponding number of solar years there were fractional remainders which, if added, together would be almost exactly unity. By taking the half-sum, therefore (instead of the difference as De Cheseaux did) an equivalent in *whole numbers* would be found between lunar years and solar years.

To take these numbers as lunar years accords with the Jewish reference in the passages in which they occur in Daniel; furnishing a further example of the clue afforded by the prophecy itself. Also, the half-sum is simply the mean value in each case, thus:—

2300 lunar years = 2,231·517159 solar years.
1260 „ „ = 1,222·483313 „ „

Half the sum = 1780 lunar years = 1,727·000236 solar years.

This cycle (1,780 lunar years = 1,727 solar years) is the highest type possible, as it brings the lunar year of 12 Synodic months or lunations into accord with the Tropical year of the seasons; and it is clear that it could only have been discovered through the hint given in the inspired Scriptures. It also affords a simple ratio between these two years which is very convenient for calculation purposes. Its accuracy stands quite above any other of the cycles discussed, as here shown :—

	Error per century.	Error of one day in :—
Lunar year. Epoch 1900 = 354·3670582		
Lunar year as given by the cycle itself = 354·3670097	0·00501 day.	19,960 years.

This cycle falls short of perfect exactitude by only 2 hours in its whole period, as shown by the above decimal of a year (·000236).* It should also be noted that the lunar year, although of little account to us, is of primary importance to Eastern peoples, especially in the Hebrew and Mohammedan modes of reckoning; and such accuracy as this, with only one day of discrepancy in more than ten times the length of the Christian era, far transcends anything attained by human endeavour to meet calendar requirements.

Considered from the prophetic standpoint also, the fulfilment of a predicted period to a day represents perfect accomplishment. Such accuracy is not unclaimed in Scripture, as it is stated that the promise made to Abraham was fulfilled to a day at the Exodus from Egypt. (Exod. xii, 41.) The end of the predicted Wandering in the Wilderness was marked by the ceasing of the manna, at an exactly completed year from the original Passover. (Joshua v, 10–12.) Expositors have also expected fulfilment to a day, for the period of the Seventy Weeks to Messiah, revealed to Daniel; especially when reckoned in lunar years, when the full moon gives the same day of the first month at the beginning and end of the period. We cite these as examples, without entering upon exposition, to show the

* Contrast this with the 6 hours of shortage in the individual solar year; corrected roughly every fourth year by an extra day in our calendar.

limit of accuracy in such cycles or periods that represents perfection in this sense. A note on the number 1,727 in relation to the perfect number 1,728 is also appended. (Note C.)

Since these calculations were first made by the writer, for a technical Paper published 30 years ago, a distinct improvement in the three Daniel cycles has come about, because of higher accuracy in the lunar data through revision meantime. The cycles have thus come so near to true exactitude that in following the matter any further we enter upon refined calculations arising from slight change that can be detected in the solar and lunar periods themselves, in the course of the centuries, known as secular acceleration. On the effect of this, we append a technical note. (Note B.)

A summary of the results is given in the following table, in which the three Daniel cycles are marked with asterisks.

Classes of Cycles compared. (At Epoch A.D. 1900.)	Error per century. (As a fraction of a day.)	Period in which the error amounts to one day.
I. *Solar year and the Day.*		
Julian year. Cycle, four years	0·78012 day.	128 years.
Gregorian year. Cycle, four centuries ...	0·03012 „	3,320 „
II. *Lunar year and the Day.*		
Calippic cycle (Lunations and days) ...	0·3251 day.	308 years.
Mohammedan calendar. Cycle, 30 lunar years	0·04035 „	2,478 „
*Cycle, 504 lunar years equal to 178,601 days	0·00052 „	Almost exact.
III. *Solar year and Lunar month.*		
Metonic cycle. (Lunations and years)	0·4550 day.	220 years.
*Cycle of De Cheseaux. Period, 1,040 years	0·00664 „	15,056 „
IV. *Solar year and Lunar year.*		
*Cycle, 1,780 lunar years equal to 1,727 solar years	0·00501 day.	19,960 years.
Ditto. At Epoch 600 B.C.	—	More than 26,000 years.

* The three cycles marked with asterisks are deduced from the Prophetic numbers in the Book of Daniel.

Concluding remarks.—We thus find that the only three cycles which exceed the high accuracy of one day in 10,000 years are those deduced from the prophetic numbers. They more than cover the entire human period with less than one day of error.

This results from a comparison with our best modern data, at the present epoch; but when secular acceleration is taken into account the cycles are found to challenge the limits of accuracy in the data themselves.

These cycles are not hidden in the prophetic numbers in any recondite or abstruse way; but their periods are simply a multiple, or a difference, or an arithmetical mean between them.

Can it then be deemed unreasonable to believe that these periods were revealed by the Creator, who originally appointed the sun and the moon for times and seasons? That He should use such periods to mete out human destinies is but to correlate man with the works of creation which surround him; and to show once more that as the heavens are higher than the earth so are His thoughts higher than our thoughts.

We may conclude with a quotation from Professor Birks, giving a wide outlook into future time. After discussing the periods predicted by the Prophets in their relation to the movements of the sun and moon, he says: "Surely, in the view which is thus unfolded, we are raised out of the contracted range of human reckonings (as in calendar systems) to a lofty elevation of thought, and catch some glimpses of that mysterious wisdom by which the Almighty blends all the works of nature and of providence into subservience to His deep counsels. A divine ladder of time is set before us; and as we rise successively from step to step, days are replaced by years, and years by millennia; and these perhaps hereafter, in their turn, by some higher unit, from which the soul of man may measure out cycles still more vast, and obtain a wider view of the immeasurable grandeur of eternity . . . . . Human science has strained its utmost efforts in calculating the actual motions of the Moon and the Earth; but the determining causes which fixed at first the proportion of their monthly and yearly revolutions, have altogether eluded its research. Yet these elements of the natural universe are linked in, by these sacred times and celestial cycles, with the deepest wonders of Providence, and the whole range of Divine Prophecy." (*First Elements*, chap. xiii, pp. 370–372).

NOTE A. *The length of the day.*—The causes operating continuously to alter the length of the day, are these: (1) The friction of the tides acting as a brake to decrease the earth's rotation. A mathematical investigation of this effect in the various oceans and seas has been made by Dr. Harold Jeffreys of Cambridge, who concludes that owing to this tidal friction "the day has probably lengthened a second in the last 120,000 years. (2) The wearing down of mountain ranges and denudation generally tends to increase the earth's speed; for any material descending from a higher to a lower level accelerates its rotation. But if the theory of isostasy is correct, mountain ranges would rise somewhat as they wear down, due to decreased pressure on their base; and this would partly compensate for the effect of denudation. (3) Any shrinkage of the earth in cooling. Dr. Jeffreys discusses this question exhaustively, from data for the expansion of rocks by heat, their elasticity, compressibility, crushing strength, etc., as found experimentally. He shows that continuous cooling would not give continuous adjustment but would result in long quiet intervals separated by short and great upheavals. Objections to this view are answered; especially as it is known that there have been long intervals of quiescence in the history of the earth. He finds from the data that the accumulation of stress, on reaching its limit, would cause separated epochs of mountain building; computed to be about 50 million years apart. These upheavals would thus correspond to the dividing points between the four great ages in Geological time, described in any text-book. (*See The Earth*, by Jeffreys, 1929; especially pages 267, 277, 285, 287, 293-294.)

As to variation in rotation temporarily or for a period, which astronomers suspect, the main cause seems to be the accumulation of ice at the Poles, in some seasons or for a series of years. This decreases the weight of equatorial waters and tends to accelerate rotation. Yet even in the extreme conditions of the Glacial age, this effect would only be residual; because in the displacement of waters any increased rotation necessarily raises the ocean level in the equatorial zone.

In any moderate number of centuries these effects seem scarcely measurable, and thus difficult to differentiate from variations in other periods, as astronomers find. This needs to be pointed out, since unfounded or extravagant statements on

the subject are sometimes made. What in reality is so very remarkable is the wondrous stability of the earth.

NOTE B. *On secular acceleration.*—Cycles of such high accuracy as these are affected by the slightest variation in the motions of the sun and moon. The length of the Tropical year is decreasing by half a second per century (or exactly 0·530 second); and the rate of this change is nearly constant. The period of the Synodic month is also decreasing. Hence, in going back in time, both the solar and the lunar year are slightly longer than at present.

The decrease in the length of the month, or the moon's secular acceleration, is always given as the angular value by which it will be in advance of its calculated position after the lapse of a century. The matter is complex, however; for in addition to astronomical causes, a considerable part is due to the reflex effect of tidal friction upon the moon, which diminishes its total energy. The general average value during past centuries, however, can be checked by comparison with ancient eclipses, recorded with careful detail in Babylonia between 700 and 500 B.C., as well as with Chinese and Egyptian observations. The angular value of 12″·4 per century is now generally accepted. This may be taken to mean that the moon is falling forward by an amount measured by 1–150th of its diameter in a century, in addition to its average rate of speed. (*See* Herschel, *Outlines of Astronomy*, paragraph 741; Sir Robert Ball, *Elements of Astronomy*; and investigation of ancient eclipses, by Dr. J. K. Fotheringham, *Monthly Notices*, R. Astro. Soc. 80, 1920; 578–581.)

The present accuracy of the cycle, 1780 lunar years = 1727 solar years, is one day in 19,960 years, or only two hours in the length of the cycle (exactly 2·04 hours). Its accuracy in Daniel's time, in 600 B.C., can be found on the assumption that the acceleration of the moon, as well as the sun, has been constant during the 25 centuries since then. In the calculations which need not be detailed, the lunar angle representing acceleration was transformed into a time value, the lengths of the solar and lunar years in 600 B.C. were determined, and the cycle-value of the lunar year was found from the solar year at both epochs. As both these "years" are slightly longer in former centuries, the change in the accuracy of the cycle is not very marked, though distinctly better in relation to the earlier epoch.

The calculated error of 2 hours during the period of this cycle is thus even less in the past; which shows its superiority over the others. Also, in the 1,780 lunar years of this cycle, there are 21,360 lunar months; and these 2 hours represent an error in each month of only one-third of a second according to our present data.

There is a probability that all the periods and cycles indicated in Scripture would together attain absolute accuracy at an epoch in early human history, by the convergence of their variations. They might then prove to form definite fractions of the longest known astronomical period, or else together to build it up; namely, the rotation of the Pole in approximately 25,800 years, which causes the Precession of the Equinoxes. This period is itself subject to variation in the course of the centuries, as well as the solar and lunar periods, requiring much refinement in the calculations; but an investigation to determine the required epoch would be most interesting.

NOTE C. *On the number* 1,727, in relation to other periods and numbers in Scripture. The Jubilee is the year following the completion of a period of seven weeks of years, or the 50th year, following the 49th. Similarly, the year following the close of this cycle of 1,727 years is the 1,728th, which is the cube of 12. This number is made very prominent in Revelation in the description of the New Jerusalem, the cubical city; its length, breadth and height being equal, and each side 12,000 furlongs, making a cube of 1,728 thousand million. Thus the addition of a year to the cycle, or its jubilee year, brings it into correspondence with the mystical number of cubical perfection in the New Jerusalem.

REFERENCES; to authors who have written on the astronomical cycles implied in the numbers and periods which are mentioned in the Prophetical books of Scripture.

Rev. William Hales, D.D., an outstanding chronologist.

"A Synopsis of the Signs of the Times, past, present and future; attempted to be traced from the Chronological Prophecies in the original Scriptures." 8vo. 1817.

"A new Analysis of Chronology, History and Prophecy; . . . explained upon Scriptural and Scientific principles." Four vols. 8vo, 1830. (First published in three vols. 4to, 1812). This work includes a thorough and comprehensive discussion of

Hindu, Chaldean and Egyptian chronology and cycles, with full explanations; as well as the Prophetic periods.

Rev. Geo. S. Faber. "The Sacred Calendar of Prophecy." Three vols. 1828. In one of his works, he points out that in Prophetic symbolisation, there is a systematic employment of miniature; including in predicted periods, a specific rate of numerical reduction.

Also, *William Cuninghame*; a voluminous writer on Scripture chronology and cycles; about 1838.

Rev. Professor T. R. Birks, Fellow of Trinity College, Cambridge. "First elements of Sacred Prophecy," 1843; containing a discussion of all known cycles, with a chapter on: The Cyclical character of the Prophetic times.

Dr. H. Grattan Guinness. "The Approaching end of the Age." Thirteen editions, 1878–1897. Section III, Chap. III, and Appendix A: Soli-lunar cycles, and their relation to the Chronology of History, pages 509–580. A discussion of cycles of various lengths, from the Jubilee of 50 years to the Great Year of the precession of the Equinoxes, in approximately 25,800 years.

Dr. W. Bell Dawson. "Solar and Lunar Cycles implied in the Prophetic Numbers in the Book of Daniel;" Trans. Royal Society of Canada, 1905. Vol. XI, Section III; pages 33 to 52.

The earlier of the above writers laid the foundations of this subject, following upon the Rev. Robert Fleming's remarkable work on the Prophetic periods in 1701 (reprinted in 1848, 1870 and 1929), and the discovery of De Cheseaux in 1754. Guinness acknowledges his indebtedness to his predecessors, especially to Professor Birks.

Montreal, Canada;

Discussion.

Lieut.-Colonel Arthur Kenney-Herbert said: This paper to which we have listened is a valuable addition to our Library. I wonder how many of our members realise the importance of a good collection of our annual Proceedings. The student can find in these Proceedings the most up-to-date opinions of men who have specialized in some line which bears more or less directly on the study of the Bible. He will find in our Proceedings information

not to be found in plain and homely language in any encyclopædia or text-book.

Personally, I welcome this paper because it starts on a sound foundation. I presume that it is intended to help those who would seek to turn the time references of the Bible into the terms of our calendar. It rightly ignores any reference to the stars. Gen. i, 14, clearly lays down that the sun and moon are to provide us with the necessary units with which to measure. The sun is for days and years, the moon marks God's appointed dates (*see* Ps. civ, 19). In this connection I might add that I can find no reference in the Bible to a year of 12 lunations.

The student who follows this paper will find that the Jewish year is clearly defined, beginning with the spring moon nearest to the equinox. With good lunar tables, he should be able to turn any month date of the Old Testament into a date of the Julian calendar, providing the year is known. Alternatively, the week-day incidence of any month date may be a check on the accuracy of the year.

The paper shows that God fulfils His types and his prophecies to the day. This we believe, I suppose, but do not act on, as a rule. The date of the Crucifixion turns on the 14th day of the new moon. God, who fulfils to the minute, would not allow his fulfilment to be 24 hours in error, owing to man's eyesight or a cloudy sunset.

This raises a point: Astronomical new moon is a misnomer, it might be called *no moon*; God has appointed the first day of new moon to be determined by its visibility. The very words imply it. I know of no passage in the Old Testament where the sense of "Chodesh" would be impaired by translating invariably by "new moon."

The accuracy of the Mohammedan reckoning is interesting, but in my experience, the 1st of Bairam was not a question of calendar, it was a question of visibility.

It is a valuable fact that the length of the mean day has not changed appreciably presumably during the last 120,000 years.

Cycles.

God's plan has evidently been designed in cycles, and the writer quotes one or two periods measured in metonic cycles. To these

I could add others, if my own personal effort at a true Bible chronology be exact. For example: From the Covenant with Abraham to the Ascension of Our Lord was 1,938 mean years, that is 102 metonic cycles. The error by then had amounted to 10 days, so from the Covenant with Abraham to Pentecost was exactly 102 cycles of 19 soli-lunar years. From Pentecost to the June of 1914 was also 99 metonic cycles.

The student who wants to study chronology for himself will do well to master Grattan Guinness's astronomic data contained in the *Approaching End of the Age*. He will find that the second volume of *Lunar Tables in "Creation Centred in Christ"* will meet all his need.

NUMBERS.

Now these tables were built up by discovering a mean year and a mean lunation from the 2,300, and 2,300 — 1,260 = 1,040 numbers contained in Daniel.

These is no need to turn days into years; all that we have to do is apply any given number to years, days or months as the case may be. If the significance of any number defines any particular period, I expect that God uses the number as the time limit of the period. It may be used with any time unit.

For instance, 52 is 13 × 4; 13 is the number of rebellion, 4 is the world number: the combination is world rebellion. As a matter of indisputable fact, the Great War lasted 52 months of 30 days exactly.

Mrs. MAUNDER said: I cannot agree with the Lecturer's argument in the paragraph on *Primitive Endeavour*. Neither in Ancient Egypt nor Babylonia was there an early attempt made to fix the year by noting the points on the horizon when the sun rose and set, giving either equal days and nights, or the longest days or nights, so as to form an agricultural calendar. Indeed, in such low latitudes as these two countries, such an observation is by no means an easy one, since the equator rises very steeply from the horizon, and there is very little difference between the longest and shortest days. If my memory serves me aright, in Mesopotamia observations of equal day and night were not made much before 700 or 800 B.C.

In Egypt the year was given by the Nile always, and, as it chances, from meteorological reasons, the initial rise at Cairo is very near the summer solstice, and the maximum inundation near the autumnal equinox; and that always gave a tropical year. But about 2800–2900 B.C. it so happened that Sirius, the brightest star in the heavens, rose, for the latitude of Cairo, heliacally at the summer solstice—that is for Cairo when the Nile began to rise, and the Sothic Cycle connected with Sirius of 1,461 years (as mentioned by the lecturer) took its origin; but, as a consequence, this cycle went twice through all the seasons before the beginning of our era, and so ceased to inform the farmer when to sow or reap. But the farmer never needed any agricultural help from this cycle; he got all he wanted from the Nile itself.

But the lecturer is definitely wrong in his paragraph *Types of Calendars*, where he gives for the Ancient Hebrew the " simple rule: ' The first day of the first month shall be at the New Moon, which is nearest the Equinox in spring; that is, within 15 days before or after it.' The full moon of the Passover will thus always be at the middle of the first month "—and this quite apart from what I have already said, that the observation of equal days and nights was unknown both to the Egypt from which the Children of Israel had just come out and to the First Dynasty of Babylon, from which their ancestor Abraham the Hebrew had crossed over the Euphrates into Palestine.

For the command given to Moses (in Leviticus, chapter xxiii, 5–15) was: " In the fourteenth day of the first month at even is the Lord's Passover . . . ye shall bring a sheaf of the firstfruits of your harvest unto the priest: and he shall wave the sheaf before the Lord . . . on the morrow after the Sabbath [16th Abib] the priest shall wave it . . . and ye shall count unto you from the morrow after the Sabbath, from the day that ye brought the sheaf of the wave offering: seven Sabbaths shall be complete." And again (Deut. xvi, 1–10): " Observe the month of sprouting . . . seven weeks shalt thou number unto thee: begin to number the seven weeks *from such time as thous beginnest to put the sickle to the corn.*" And note that all the subsequent feasts of the year took their times from this putting of " the sickle to the corn."

Now the barley (which we are told in Ex. ix, 31 was sprouting

(Abib) when Pharaoh let the people go) harvest only *begins* to ripen at the end of March in the low, hot, Jordan valley, and is not ripe for the highlands till the beginning of May. Therefore, the Passover (on the 14th Abib) could *never* have been held until at least a week after the equinox, and might need to be postponed for another month if the standing corn were not yet ripe for the sickle. It all depended on what the weather had been.

The nearest new moon to a definite date—say, in vernal equinox—may be fitted into a cycle ; but the weather on which the ripeness of the harvest depends cannot so be. And this raises the question as to what God Himself puts an emphasis upon—A calendar with a precise and almost perfect repetition, or the ripening of the grain. The prophet Micah answers, for he says : " The Lord's voice crieth . . . ' my soul desireth the first ripe fruit."

There is no doubt that the numbers 2,300 and 1,260 speak of a purpose in God's mind—a purpose that we do not know. Is it simply of the perfect cyclical repetition of lunar and solar years fitting into each other throughout the centuries ? If it were just that, then surely He would have spoken directly of the still more perfect cycles got by taking their difference or their arithmetical mean !

Sir AMBROSE FLEMING, D.Sc., F.R.S., wrote : I have been much interested in this valuable paper by Dr. Bell Dawson on Prophetical Numbers in the Book of Daniel, as it is a subject which attracted some little attention from me in past years.

Some 30 years ago, I noticed the soli-lunar character of the period of 1,985 solar years, as it contains a nearly exact integer number of synodic months or lunations.

This period of time is the difference between 2,300 years and 315 years, both of which are soli-lunar, but the errors are in the same direction.

Now, 1,985 solar years are equal to 725,005·7670 days and 24,551 lunations are 725005·7606 days. The difference is 0·0064 days or about 9·2 minutes of time. Hence, after this period of 1,985 years, the sun and moon come round with respect to the earth into almost exactly the same positions. The period of 315 years is seen at once to be a quarter of 1,260, which is also a Daniel cycle number.

I have not, however, been able to trace any very important historical period of time covered by 1,985 solar years, except the following period.

The Roman general Pompey took Jerusalem in 62 B.C. and began the Romanisation of the city. In A.D. 663, Pope Vitalian decreed the exclusive use of Latin in the services of the Church, reckoning 1,985 years from 62 B.C. and 1,260 from A.D. 663, they both run out in A.D. 1923, which is the termination of other prophetic periods also.

Mr. W. E. LESLIE wrote: The author contends that certain prophetical numbers correspond so closely with certain celestial cycles that the correspondence must be intentional. Further, he contends that it is closer than was possible for a human astronomer in those times, and therefore must be due to revelation. But in that case should we not expect an exact coincidence rather than an approximation?

In 1912 (*Expositor Series* viii, vol. III), J. Lepsius suggested that the number 2,520 was intended to be the sum of the days in 480 Julian years of 365·25 days and 480 Apocalyptic years of 360 days. Further that the sum of the days in 500 Julian and 500 Apocalyptic years was equal to the sum of the two numbers at the end of Daniel xii—1,290 and 1,335. The author does not mention this. What does he think of it?

If these correspondences can be established, we have to ask two questions. Were the movements of the earth and moon designed to fit human history? Or is human history shaped to fit these movements? In either case, we find our feet near the slope that descends to the superstitious depths of Astrology.

AUTHOR'S REPLY.

The writer desires to express his thanks to those who have been good enough to take part in the discussion, and who have thrown further light upon cycles. He may be allowed, however, to reply briefly to some points, to obviate any misunderstanding.

Lieut.-Col. Kenney-Herbert remarks that he finds no reference in the Bible to a year of 12 lunations. But it is surely evident that

each Hebrew year *was* a year of 12 lunations; with an extra lunar month added when needful to keep the year in harmony with the seasons. Yet some prophecies refer to nations that omitted this correction and kept to a lunar reckoning.

As to the month beginning with the actual visibility of the new moon, it may at least be noted that the Divinely arranged system is on so sound a basis that it works out with the true hour of New Moon as now calculated; as may be seen in the present-day Jewish calendar.

Mrs. Maunder, in discussing the year, refers to the difficulty of observing equal day and night, which is very true. But the shift of the point of sunrise (or sunset) on the horizon can be used to fix a definite day in the year; and thus to keep the seasons in their place. This method is as applicable in the tropics as elsewhere; and it was in actual use in ancient Egypt, where the temples were set on a line of sight to a point on the horizon. By a system of masonry diaphragms, it was only on a definite day that the beam of sunrise would shine through to the interior shrine. (*See* Lockyer, *The Dawn of Astronomy*, pp. 109–110.) A fixed point in the solar year (either at or near the Equinox, or at the Solstice) was thus determined, quite independently of the rise of the Nile.

Regarding the beginning of the year, the First month was related primarily to the moon; and from what is said in Scripture, the time of harvest appears to be accessory. The harvest date would no doubt help in deciding whether an intercalary month was required to keep the seasons in their place; as Mrs. Maunder seems to suggest.

We hardly need to be ignorant of the purpose of the numbers 2,300 and 1,260; for the Prophecies themselves show them to be limitations of times of trial and difficulty. We have not touched upon their fulfilment in history; for the present paper is limited to their relation to astonomical cycles.

Mr. W. E. Leslie remarks that if these cycles are due to revelation, we should expect them to be better than an approximation. But can they be termed approximate? For in dealing with such an extreme degree of accuracy as these cycles present, we have to reckon with variations of less than a second in the year and month, in the course of the centuries. If we had sufficiently extended knowledge of this "secular variation" to enable us to make the

investigation, the cycles might prove to have absolute accuracy (in the mathematical sense) at some era. Yet in Scripture, the fulfilment of predicted periods to the nearest day is reckoned as accuracy. (Exodus, xii, 41.) These cycles far exceed this; for their "error" is only one day in a period of 10 to 15 times the length of the cycle itself.

The question of the relation of human history to the movements of the earth and moon should rather point us to One Lord over all, than tend toward superstition. For much idolatry is connected with the sun, moon and planets; and judgment may be meted out to the nations by the movements of these very bodies, to show that the Lord is "above all gods." For the career of nations, and tolerance of their evil ways, is limited by God the Creator. (*Cf.* Genesis xv., 16, and Acts xvii., 26.)

788TH ORDINARY GENERAL MEETING

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, MARCH 25TH, 1935, AT 5.30 P.M.

G. A. LEVETT-YEATS, Esq., C.I.E., I.S.O., F.Z.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed, and the HON. SECRETARY announced the election of George Robert Gair, Esq., M.A., F.S.A. (Scot.), as an Associate.

The CHAIRMAN then called on Mr. Douglas Dewar, B.A., F.Z.S., to read his paper on "A Critical Examination of the Supposed Fossil Links between Man and the Lower Animals."

A CRITICAL EXAMINATION OF THE SUPPOSED FOSSIL LINKS BETWEEN MAN AND THE LOWER ANIMALS.

By DOUGLAS DEWAR, Esq., B.A., F.Z.S.

INTRODUCTION.

AS I shall have to mention a number of fossils having strange names and the age of the rock in which each of these was found, a chart has been prepared in order to make it easier to follow my remarks. In the left-hand column of this is set forth the name of every known fossil of man and anthropoid ape. The other columns represent geological periods in order of time, the youngest period being on the left and the oldest on the extreme right. The chart shows only the periods in which anthropoid and human fossils have been found, *viz.*,

the Quaternary (Pleistocene) and all the Tertiary except the earliest period—the Eocene. The chart is not drawn to scale. Judging by the thickness of the rocks of each period at the place of their greatest development, the duration of the Pliocene is about three times that of the Pleistocene, and the Oligocene a little more than three times, while that of the Miocene is more than five times as great as that of the Pleistocene. As regards the actual duration of time: at present there are no known means of determining this accurately. The estimates are all of the nature of guesses. Some estimate the duration of the Quaternary and Tertiary Periods at about 2 million years, others put the figure at about 80 million! Judging by the amount of sodium in the sea the estimate of 2 million is probably far less inaccurate than that of 80 million years.

The divisions of the Quaternary and Tertiary rocks are primarily based on the percentage of the fossils they contain of shell-fish representing living species. Thus in the Pleistocene from 90 to 100 per cent. of the shell-fish fossils are those of living species, in the Pliocene the percentage is from 50 to 90, being greater in the later part of the period, in the Miocene the percentage is from 20 to 50, and in the Oligocene from 10 to 20. The horizontal line in the cages representing periods indicates the horizon or horizons in which fossils of the genus named in the first column are known to occur. A very short line indicates that only one fossil of the creature has been found, or, if more than one fossil has been found, that all are from the same horizon. Thus, the short line against *Homo heidelbergensis* indicates that only one fossil of it has been found, and this in a rock which is generally supposed to be of earliest Pleistocene time. The long line against *Dryopithecus* indicates that fossils of this genus have been found in several lower Pliocene horizons and many Miocene ones. In the case of *Homo sapiens*, the line is made to end with the lowest Pleistocene because no fossil of *H. sapiens* has been found in any rock universally admitted to be of earlier date than lowest Pleistocene. If, however, those who deem the deposit in which the Castenedolo skull was found to be of early Pliocene date are right, the line representing *Homo sapiens* must be extended as shown by the row of dots. If, as has been suggested, the Calaveras skull be of a still earlier period the line must be even further extended. In the case of species or genera still living, the lines representing the known distribution have been extended a little to the left of the Pleistocene age to represent this.

As some of the fossils we shall have to consider were found in strata containing either no other fossils, or very few, the determination of their date is difficult; in such cases there is often difference of opinion among experts. In the chart the period shown is that accepted by the majority of them. By running the eye up and down the chart in any part of any period it can be seen at a glance what men and apes are known by their fossils to have been in existence at that period of time. For example, the chart shows that three fossils of higher Primates have been found in lower Oligocene deposits but none in those of later Oligocene date. The chart shows only fossils, and not human artifacts, found in the rocks. I may here mention that stone implements, which appear to have been chipped by hand, are abundant in Pliocene deposits, and some occur in Miocene and even in Oligocene rocks.

Most evolutionists believe that man and the living anthropoid apes, chimpanzee, gorilla, orang and gibbon, have all descended from a common ancestor that lived comparatively recently as geologists reckon time—an ancestor that gave rise to diverging lines of descendants leading up to man and the above four anthropoids. If this be so, some individuals on each of these lines of descent must have left fossil remains. Since the appearance of Darwin's *Origin of Species*, unceasing search has been made for fossil links between man and his supposed simian ancestor, in full confidence of discovering such. The first discovery, made very shortly after the appearance of the *Origin of Species*—that of a skull of Neanderthal Man (*Homo neanderthalensis*)—was apparently just what was sought—an ancient man more brute-like than modern man. Evolutionists were jubilant. Professor King wrote: "The Neanderthal skull is so eminently simian . . . that I am constrained to believe that the thoughts and desires which once dwelt within it never soared beyond those of the brute." (Keith, *The Antiquity of Man*, p. 189.) This assertion affords an excellent example of the wish being father to the thought. We now know that Neanderthal Man had a brain greater than that of some living races of men, was a skilful artizan and buried his dead. Owing to the belief that man is an evolving animal, subsequent discoveries of remains of modern types of man in deposits much older than those in which Neanderthal Man occur were discredited. Despite the plainest geological evidence, scientific men declined to believe in the great antiquity of the human skull found in

1860 by Professor Ragazzoni at Castenedolo in Italy, associated with Pliocene shells in an undisturbed stratum. Similar treatment was meted out to the Abbeville jaw, the Foxhall jaw and the Olmo skull found in 1863, to the Calaveras skull found in 1866, the Clichy skeleton found in 1868, the Galley Hill skeleton found in 1888, and the Oldoway skeleton found in 1913.

Very different was the treatment of the remains named *Pithecanthropus*, the ape-man, found by Dubois in Java in 1891–92 in deposits of much earlier date than those containing fossils of Neanderthal Man. This was hailed as the long-sought missing link—something midway between man and anthropoid ape. Haeckel wrote (*The Last Link* (1898), p. 26): "*Pithecanthropus erectus* of Dubois is truly a Pliocene remainder of that famous group of catarrhines which were the immediate pithecoid ancestors of man. He is indeed the long-searched for 'missing link,' for which, in 1866, I myself had proposed the hypothetical genus *Pithecanthropus*, species *Alalus*." Then came a series of finds as disconcerting as unexpected. The first was the finding in 1907 of the Mauer jaw (*Homo heidelbergensis* or *Palaeoanthropus*), which was human of far more primitive type than Neanderthal Man—in deposits of about the same age as those that held the remains of *Pithecanthropus*. Still more disconcerting was the finding in 1912 of the Piltdown skull (*Eoanthropus*), clearly human but more brute-like than Neanderthal Man, in deposits of apparently nearly the same time as those that contained the Mauer jaw and *Pithecanthropus*. These finds meant the dethronement of the last named from its position of half-human ancestor of man, because it showed that contemporaneously with it there existed fully formed men. Meanwhile, Neanderthal Man had had to be rejected as ancestral to modern man, because the human beings that immediately succeeded him in the deposits differed from him anatomically to such an extent as to preclude their being his descendants.

In 1921 came the discovery in the Broken Hill mine, associated with the bones of many animals, all save one belonging to living species, of the very primitive type of man known as Rhodesian Man (*Homo rhodesiensis* or *Cyphanthropus*). The last find shows that a very primitive type of man was in existence in quite ercent times.

By this time zoologists and anthropologists were compelled to admit that their earlier ideas regarding the evolution of man were incorrect, and they were, in consequence, led to consider

that perhaps after all Dr. Reck may have been right in his contention that the modern type of human skeleton unearthed by him at Oldoway in Tanganyika Territory was of very ancient date. In consequence, in 1931, an expedition composed of Drs. Reck and Leakey and four other experts visited the spot to try to settle the age of the skeleton Reck had found. They discovered in the layers immediately below that from which the skeleton had been exhumed, not only tools of human manufacture, but the remains of *Dinotherium*, an extinct genus of the elephant family of which fossils had previously been found in Miocene and Lower Pliocene beds. This discovery must mean either that *Homo sapiens* existed in Lower Pliocene time, or that *Dinotherium* persisted in East Africa long after it had become extinct elsewhere, or that the human skeleton was of later date than the other fossils associated with it. The experts accepted the last alternative. Dr. Leakey writes (*Adam's Ancestors* (1934), p. 204): "We finally arrived at the conclusion that it (the skeleton found by Reck) was not nearly so ancient as the fossil animals or Stone Age implements found in the same deposits, but that it represented a maker of the very much later Aurignacian culture (Middle Pleistocene)."

But a surprise was in store for the investigators. On March 29th, 1932, Dr. Leakey found at Kanam, in East Africa, a human lower jaw associated with the remains of extinct animals, including a tooth of *Dinotherium*, together with implements of Oldowan culture, which "strongly suggest an antiquity greater than that of either the Suffolk Bone Bed or of the base of the Choukoutien deposits." In other words, the jawbone in question is of a date not later than Upper Pliocene. After careful examination of the mandible, Leakey wrote (*loc. cit.*, p. 207): "There are small details—especially the nature of the roots of the teeth as revealed by X-ray—which have made me separate this specimen from *Homo sapiens* and describe it as a new species called *Homo kanamensis*, but it is very closely related to *Homo sapiens* and must be regarded as ancestral to that species." Some authorities, however, consider that the jaw belongs to *Homo sapiens*.

A few days after the Kanam find, fragments of two human skulls were found by Dr. Leakey at Kanjera, near Kanam, in association with bones of animals more recent than those at Kanam and stone tools of Chellean culture (Lower Pleistocene). He considers that these fragments exhibit no character inconsistent with man of modern type.

Thus, even if we assume that *Dinotherium* persisted much later in Africa than in other places, and reject the evidence of the antiquity of the Castenedolo skull (and the only reason for so doing is, as Sir A. Keith says, acceptance means shattering accepted beliefs), we are confronted with the facts that man of modern type (*H. kanamensis*) existed in the Upper Pliocene and *H. sapiens* in Lower Pleistocene time, *i.e.*, long before Neanderthal Man became extinct. These facts exclude from the ancestry of modern man the following creatures, which have been adduced as possible progenitors: *Sinanthropus* (Pekin Man), *Pithecanthropus*, *Australopithecus* (a large-brained fossil anthropoid ape), Heildelberg Man, Piltdown Man, Rhodesian Man, Neanderthal Man and Java Man (*Homo javensis* or *Javanthropus*). It is therefore useless to look for ancestors of man in deposits earlier than the Pliocene. This fact would have been realised seventy years ago had not zoologists been dominated by a theory.*

* Since this paper was sent to press the antiquity of the Kanam jaw has been questioned. This invariably happens in the case of a fossil of which the apparent age conflicts with the dominant theory; on the other hand, the age of a fossil is almost invariably accepted without challenge when it does not so conflict.

Two years ago a conference of experts at Cambridge accepted the alleged antiquity of the Kanam jaw. Recently a geologist, Professor P. G. H. Boswell, at the suggestion of Dr. Leakey, the discoverer of the jaw, and under the auspices of the Royal Society, visited the locality of the find. He reports that owing to the site being inadequately identified either on the map or on the ground, he could not find it; that a photograph purporting to show the site is inaccurately identified, and that the geological strata of the district are liable to "slipping" and, in consequence, are unreliable for dating the fossils they hold. Therefore, in his opinion, suspicion is cast on the antiquity of the Kanam jaw.

If the stratum in which the jaw and associated fossils of extinct animals were found has in fact slipped, I must confess my inability to understand how this has caused the jaw and the implements associated with it to have slipped down and the extinct animal fossils to have slipped up without leaving traces of a fault. But strange things seem to happen in geological formations. Thus in the asphalt of Rancho La Brea, in California, the skeleton of a woman of modern Indian type was found in close association with that of the extinct sabre-toothed tiger. Experts declare that the human skeleton has sunk to the level occupied by animals of very much earlier date.

If both Leakey and Reck be wrong about the dates of the fossils they found in different localities, it would seem that expert geologists are very liable to be misled; in that case, what assurance have we that the dates assigned to *any* of the fossils mentioned in this paper are even approximately correct?

We have now to consider the fossils of later date than *H. kanamensis*. *Neopithecus* from the Upper Pliocene consists of a 3rd molar tooth. Schlosser named this tooth *Anthropodus* because of its close resemblance to a human tooth; it is, however, smaller and narrower than any known human molar. As its possessor lived very shortly before, if not contemporaneously with, *H. kanamensis*, it cannot have been an ancestor of man.

We now come to the fossils of Lower Pliocene date; these are *Palæopithecus*, two species of *Ramapithecus*, *Sugrivapithecus* and two species of *Dryopithecus*. *Palæopithecus*, from Northern India, consists of a palate holding all the teeth of one side except the incisors. No one deems this genus to be ancestral to man, but some are of opinion that it may be a progenitor of the gorilla. *Ramapithecus*, together with *Sugrivapithecus* and *Brahmapithecus*, was discovered in 1932 by the Yale North India Expedition. Dr. D. G. E. Lewis gives a description of these fossils in the *American Journal of Science* for March, 1934. These three genera are named after Hindu legendary beings. Rama was a Hindu hero, Sugriva is the king of the monkeys in the Ramayana, and Brahma the head of the Trinity of Hindu gods.

Ramapithecus brevirostris consists of the right half of an upper jaw, with two molar and two premolar teeth and the roots of an incisor. *R. hariensis*, which is from a lower horizon, consists of a fragment of the right half of the upper jaw holding two molar teeth. The teeth and jaws of this genus have a more human appearance than have those of *Sivapithecus* and *Dryopithecus*, discussed below, but their discoverer does not consider that the genus, *Ramapithecus*, to which they belong, is ancestral to man. As the teeth of every genus of ape exhibit features peculiar to the genus, it follows, evolution or no evolution, that the teeth of some genera resemble human teeth more closely than those of other genera do.

Sugrivapithecus consists of a left lower jaw bearing two molars, one premolar and roots of a molar, premolar, canine and incisor. The canines and incisors seem to have been small and more human in appearance than those of any other known ape, and the molars, apart from their narrowness, have features found in human molars. The jaw itself has both human and non-human features. The chin is better developed than that of *Sinanthropus*. Although the known parts of the jaw are perhaps more human in appearance than those of any other known ape, its discoverer

does not suggest that it belongs to an ancestor of man; it is too specialized to be such.

We have now to consider the genus *Dryopithecus*, of which more fossils have been found than of any other ape. As some authorities regard this genus as a possible ancestor of man and of some of the living anthropoid apes, we must consider it in detail. The two species named above occur in Lower Pliocene deposits. In the Miocene seven or eight other species have been found. Some of these differ so greatly from others that many authorities would split the genus into two or more genera.

Among evolutionists to-day there are two schools of thought: one believes that the human stem branched off from the main anthropoid-ape stock comparatively recently; Gregory and Pilgrim are prominent adherents of this school. According to the other school, the separation of the human from the ape stock took place much farther back, possibly as early as the Eocene. To this school belong Wood-Jones, Sergi and Osborn.

The adherents of each of these schools differ among themselves, and it is scarcely an exaggeration to say that no two authorities are in complete agreement as to the genealogical tree representing man's descent from the apes. Most of those who believe in the recent separation of man from the apes regard *Dryopithecus* as probably ancestral to man; Pilgrim, however, regards *Sivapithecus* as the more probable ancestor.

Let us now examine the claims advanced in favour of *Dryopithecus*. Some of the species of this extinct genus are from Northern India, some from Central Europe, one is from Egypt and one from Kenya. Although unusually numerous, the fossils of *Dryopithecus*, as in the case of those of all anthropoid apes, are very fragmentary and consist merely of teeth or jaws, except a fossil of *Dryopithecus* and one of a gibbon, *Pliohylobates*, both from Eppelsheim in Germany, which consist respectively of a humerus (upper arm-bone) and a femur (thigh-bone). It is very important to bear this in mind. A jaw or a tooth is a very slender foundation upon which to base a theory.

Gregory is of opinion that some progressive group of *Dryopithecus* gave rise to man. He bases this on the patterns of the molar teeth, having very little else to go upon. Of course, no adherent of the other school agrees with Gregory; and Pilgrim, who belongs to the same school as Gregory, considers that *Dryopithecus* is definitely excluded from the line of human ancestry because of the length of the molar teeth and of the symphysis,

i.e., the part of the lower jaw where the two halves meet in the middle.

Since Pilgrim expressed this opinion, *Dryopithecus leakii* was found in Kenya. Of this fossil, Sir Arthur Keith writes (*Morning Post*, August 4th, 1932): "I would not say that this is the long-sought ancestor of man and apes. He is too anthropoid in his character. The new discovery appears to be a definite link between the Chimpanzee and the Gorilla." The opinion expressed in the last sentence is shown to be incorrect by the recent find of the fossil *Proconsul*, which, though of earlier date than *D. leakii*, is definitely a Chimpanzee.

In Upper Miocene deposits have been found, in addition to six species of *Dryopithecus*, fossils of the following genera of anthropoid apes: *Pliopithecus*, *Hylopithecus*, *Griphopithecus*, *Palæosimia*, *Brahmapithecus*, and *Sivapithecus*.

Pliopithecus, represented by a lower jaw from France, and *Hylopithecus* from Northern India and *Griphopithecus* from Europe, each represented by a single molar tooth, are clearly gibbons, and there is no question of their being ancestral to man. *Palæosimia*, consisting of a single molar tooth from Northern India, is likewise excluded, because, as its name implies, it is a kind of orang. Some deem the genus to be an ancestor of the living orang.

Brahmapithecus, also from Northern India, consists of the left half of a lower jaw bearing two molar teeth, and roots of a molar and premolar. The discoverer, Dr. J. Lewis, is of opinion (*loc. cit.*) that it "has affinities with *Dryopithecus*, and was probably derived from a common stock. It may very well lie near to the stem which leads to the hominidæ proper."

All the known fossils of *Sivapithecus* (named after the Hindu god Siva) are from Northern India. Dr. Pilgrim divides them into four species—*S. indicus*, of which only one molar and one premolar tooth are known; *S. himalayensis*, of which the greater part of a lower jaw has been found; *S. orientalis*, of which the greater part of the lower jaw is known; and *S. Middlemissi*, of which only two molar teeth have been found.

Pilgrim deems (*Palæontologia Indica*, 1927) *Sivapithecus* to be "the most likely human ancestor at present known to us." When he made this assertion he, in common with most zoologists, believed that man of modern type did not exist before the Pleistocene, for he wrote (*op. cit.*): "The changes which in the human line, according to hypothesis, have taken place since the Lower

Pliocene are so radical and profound that it would be rash to deny merely from a consideration of the muzzle and teeth that any single Miocene ape could not have been the ancestor which we now seek." We now know that if such radical changes did, in fact, take place, these must have been effected between the Lower and Upper Pliocene. Pilgrim admits that the known parts of *Sivapithecus* differ greatly from those of man; the changes, he assumes, include the inward shifting of the canine and the front pre-molar and the contraction of the front portion of the muzzle. Few zoologists, even of the school to which Pilgrim belongs, accept his view that *Sivapithecus* was perhaps the ancestor of man. Professor Gregory and Sir Arthur Keith certainly do not.

Let me here say that those who are of opinion that man is descended from a primitive *Dryopithecus* or *Sivapithecus* stock admit that their opinions cannot be substantiated until more complete fossil evidence becomes available. The recent discovery of *Homo kanamensis* is, of course, very unfavourable to these opinions, shortening as it does the time-interval between man and these supposed ancestors.

We now come to the Lower Miocene fossils; these consist of a species of *Dryopithecus*, *Pliohylobates* and three anthropoid apes recently found in Kenya by Dr. A. T. Hopwood, which he has named *Limnopithecus*, *Xenopithecus* and *Proconsul*. We have already discussed the genus *Dryopithecus*. *Prohylobates*, from Egypt, where the *Dryopithecus* species was also found, is, as its name indicates, a gibbon, so there is no question of it being ancestral to man.

Limnopithecus consists of part of the left jaw bearing three cheek teeth and part of the right jaw with two of these teeth. Hopwood believes the possessor of these jaws to be allied, but not ancestral, to the gibbon and not an ancestor of man.

Xenopithecus consists of part of the left upper jaw bearing three molars. Hopwood regards this genus as a peculiar form of anthropoid ape not ancestral to man.

Proconsul consists of a left upper jaw with the teeth and a broken lower jaw containing most of the teeth. Hopwood considers that this genus is definitely an ancestor of the living chimpanzee.

This last discovery is interesting because we now have evidence of the existence in the Lower Miocene of the chimpanzee and the gibbon and probably the orang (*Palæsimia*) in the Upper

Miocene. This seems to dispose of the notion that either of the later forms *Dryopithecus* or *Sivapithecus* was the common ancestor of the anthropoid apes and man. As the evolutionist deems the teeth of man to be more primitive than those of the living anthropoid apes, and the latter had separated from the main stem by the Miocene, he must, if he be logical, expect to find both the gorilla and man also so separated by the Miocene. So far no fossils of the gorilla have been found. As regards man, unless the Calaveras skull and the Castenedolo remains be of earlier date, no fossil has been found earlier than the Upper Pliocene, but what many regard as human artifacts have been found in Miocene deposits in several localities, and even in Oligocene beds in Belgium; and, as man is the only known creature who manufactures such things, the discovery of fossils representing man in Miocene deposits should cause no surprise; indeed, the Calaveras skull may be of Miocene Age. In the Oligocene only three fossils which can be definitely assigned to the anthropoid group have been found, all in the Lower Oligocene of Egypt. These are named *Propliopithecus*, *Parapithecus*, and *Moeropithecus*.

Propliopithecus consists of half a lower jaw with the teeth. Its possessor seems to have been an anthropoid ape of moderate size. Gregory deems it to be the progenitor of both man and the anthropoid apes; Sergi is of opinion that it is the ancestor of man but not of the apes, because he considers the symphysis of the jaw to be quasi-human; Keith regards *Propliopithecus* as the ancestor of only the gibbons; Le Gros Clark thinks it is related to the immediate ancestor of the gibbons, but not an actual ancestor of either man or any living ape. This is typical of the difference of opinion that occurs everywhere among zoological experts.

Parapithecus, from the same deposit as *Propliopithecus*, likewise consists of a lower jaw, which is considered more primitive than *Propliopithecus*. Most authorities regard it as ancestral to neither man nor the living anthropoid apes. *Moeropithecus*, found in association with *Parapithecus*, consists of two molar teeth. It is allied to the latter.

From the Eocene, apart from lemur-like and tarsier-like fossils, there is only the single molar tooth known as *Pondaungia* from the Upper Eocene of Burma. Many doubt that the tooth is that of a Primate; in any case no one regards it as pertaining to an ancestor of *Propliopithecus*, *Moeropithecus* or *Parapithecus*.

Between these last and all the later Primates there is, to quote Pilgrim (*loc. cit.*, p. 15), "a developmental gap, which Gregory, in *The Origin and Development of Human Dentition*, has not been able to fill."

The above are all the fossils that have been adduced as possible ancestors of man. To-day no one having any knowledge of anatomy dare assert positively that any of them is such an ancestor. Sir Arthur Keith does not place any of them in the direct line of man's ancestry in the diagram representing his view of human evolution in his *New Discoveries Relating to the Antiquity of Man*.

From the foregoing, it is apparent that the known Primate fossils furnish no evidence against the view that man has no pre-human ancestors, that he was specially created.

This, however, does not prevent Sir Arthur Keith making the following assertion:

"If we could summon back to the world of to-day all the extinct kinds of man and ape which have flourished and passed away during the three last great geological ages and marshal them in serried ranks according to the respective periods at which they lived, we should have under our eyes an unbroken series of forms linking the brain of the lowest ape to that of the highest man." (*Darwinism and What it Implies*, p. 5.)

A more unscientific statement than this it would be difficult to find. It assumes the truth of the evolution theory, the recent separation of man from simian stock, the existence in comparatively recent times of scores of kinds of ape of which not a single fossil has been found, that during the middle Tertiary the varieties of apes were so many as to render the world a veritable monkey house, that only a tiny fraction of this great medley of apes have left fossil remains, and, strange to say, the remains that have been found happen to include none of the many links between the apes and man.*

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* Even less scientific were some of the statements of Sir A. Keith made in an interview on January 15th, 1935 (reported in *The Daily Telegraph* of January 16th, 1935), relating to Sir Ambrose Fleming's statement in his Presidential Address to the Victoria Institute that the evolution theory is the product of the imagination.

In the course of this interview, Sir A. Keith said: "I hesitate to set up against his opinions other views which I know to be correct." Here the word "know" seems to have been incorrectly used instead of "believe firmly," or "am convinced." If Sir Arthur Keith *knows* that

We, as members of a philosophical body, take the Primate fossils as we find them and not as Sir Arthur Keith would have them.

Scanty though the fossils of anthropoid apes be, they afford some interesting information and raise some difficult questions. They tell us that formerly the anthropoid apes and mankind exhibited more diversity than they now do. This does not accord well with the notion that man and the existing anthropoid apes have all descended from a common ancestor. Moreover, the known human fossils afford no evidence that the brain of man has increased progressively in size. The size of the brain case affords no criterion of the age of a human fossil; it would seem that formerly big-brained and small-brained men lived contemporaneously as they do to-day.

One question that arises as the result of the survey of the higher Primate fossils is: why have so many apparently unassailable forms become extinct—*Sinanthropus*, *Pithecanthropus*, *Dryopithecus*, *Sivapithecus*, etc. ? Were they destroyed by some great catastrophe ? Primates are not the only group in which many forms have become extinct; other examples are afforded

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man is descended from an animal, the least he can do is to name the creature.

Again, he said the human remains found in caves on Mount Carmel are "certainly 100,000 years old." He ought to furnish the proof that gives this figure its certainty. In view of the amount of sodium in the oceans, the colossal figures usually given of the age of the earth ought not to be accepted until it can be shown by what means the sea has ridded itself of the greater part of the sodium which must have been carried into it by the rivers (*vide Trans. Vict. Inst.*, vol. lxv (1933), pp. 26-37).

Further, Sir A. Keith asserted "There is no evidence whatever of any single person having been dead and then brought to life." He ought to have said "no evidence whatever of a kind I am able to accept." The Bible contains evidence. Sir A. Keith, disagreeing with Paley, may deem this bad evidence; but, nevertheless, it remains evidence.

He also said, "Darwin's proof of evolution, announced in the *Descent of Man*, over 60 years ago, was so conclusive that no biologist since has been able to disprove it." This brief sentence contains two mistakes: Darwin did not *prove* that man evolved from an ape-like creature; he brought together a number of facts which he interpreted as denoting such descent. To say that no biologist has since been able to overthrow Darwin's argument is to ignore the great works of L. Vialleton, for many years Professor of Comparative Anatomy at Montpelier, viz., his *Morphologie Generale* (1925), and *L'Origine des Êtres Vivants; L'Illusion transformiste.*

To treat certain opinions as proof and to ignore all other opinions may be excellent propaganda but it is certainly not science.

by the giant South American sloths, and many elephants, rhinoceroses, horses, etc.

Another question that arises is why, apart from comparatively modern human fossils, are the great majority of the known higher Primate fossils of so fragmentary nature, consisting as they do of jaws, or teeth? Moreover, why is it that the great bulk of these have been found either in Northern India, Central Europe, Egypt or East Africa?

Arboreal habits would account for the comparative scarcity of these fossils, but not for their fragmentary nature and limited distribution. It would seem that most of the higher Primates of which fossils are known, excluding the more recent human fossils, did not live in the localities in which their remains were found; that the fragments in question were washed from considerable distances to the places in which eventually they were buried. It may be that during the greater part of Tertiary time, men, anthropoid apes and monkeys were confined to temperate highlands and mountains. In that case, most of the sediments laid down in the areas occupied by them would have been eroded out of existence owing to the constant denudation of all deposits not protected by a covering of water. The known fossils afford no conclusive evidence that any Primate genus has become transformed into any other genus. Each new type appears in the rocks having all its characteristics, as if it had migrated from some other locality.

In the present state of our knowledge, all that science can truthfully say is that it knows not when, where or how man originated.

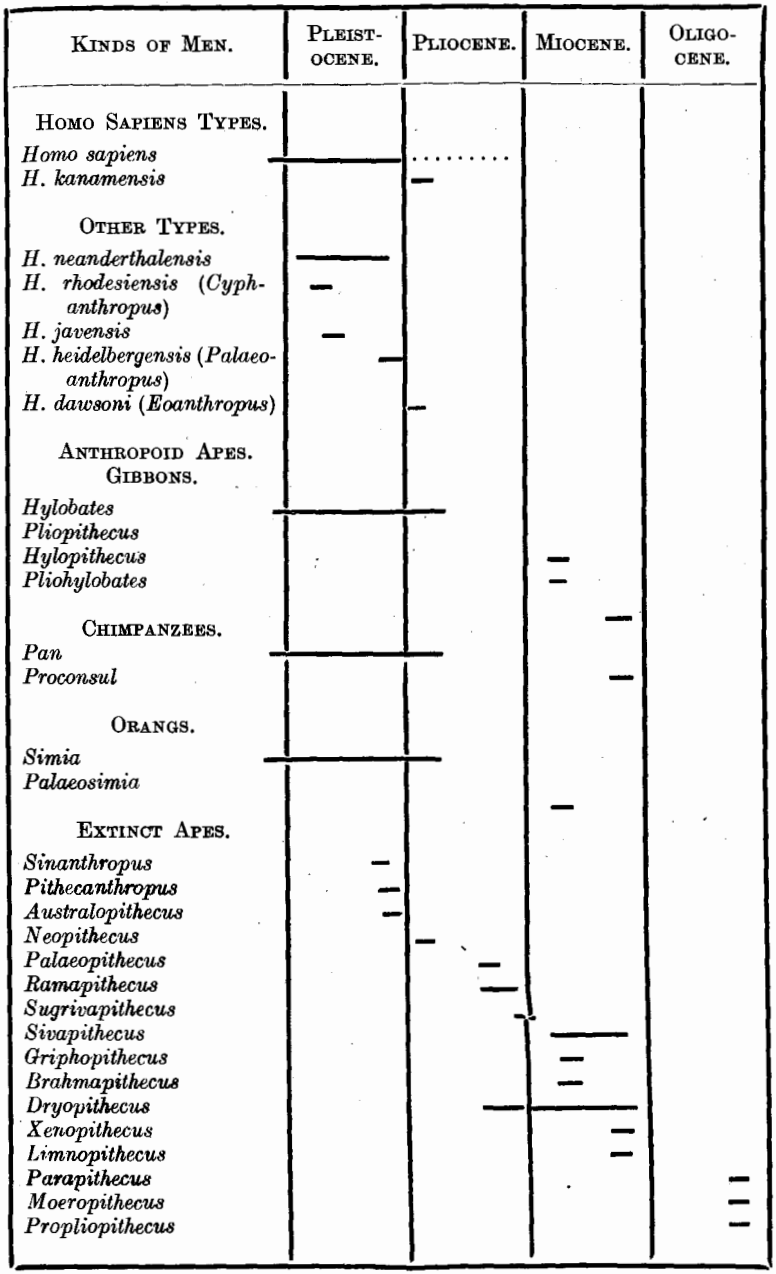
Discussion.

The Chairman said: We have had the pleasure of listening to a very instructive paper on the so-called evolutionary links between man and the lower animals and we owe Mr. Dewar thanks for his clear exposition of the case.

He has shown us how divided the Darwinists are as to the more immediate ancestry of man. How one school, geologically speaking, seeks a very recent branching off from the main stem while the other seeks a more remote date.

He has also shown us how prone they are to make the facts fit the theory instead of the theory being made to accord with the facts; as in the case of the Galley Hill skeleton, the Oldoway Man, the Kanam Man, the remains found at Kangeia and other cases.

Distribution in Time of Men and Anthropoid Apes.



This proneness is admitted by Sir Arthur Keith. In referring to certain discoveries made by Mr. Leakey at Nakuru in East Africa, he says: " all of us approach such issues—with certain biases and prejudices " (p. 170, *New Discoveries Relating to the Antiquity of Man*).

Apropos of this I might point out that Sir Arthur Keith, in the book referred to just now, states that the Peking man's skull was found in a deposit of the Pleistocene period. He compares the Peking skull with that of the Neanderthal man found at La Chapelle and is struck by the superiority of the latter's brain capacity. The Neanderthal skull had a capacity of 1,635 c.c., while the Peking skull had one of 1,000 c.c. or with a little stretching 1,100 c.c.

Sir A. Keith estimates that a period of one million years would be necessary for the development required to bring the Peking man's skull up to the standard of the La Chapelle skull. But Geology, and the time-scale he has adopted, force him to allow no more than 200,000 years between the two skulls, and in doing so he adds 50,000 years on to the age of the Peking man and throws him back into the Pliocene according to his own time-scale. He then exclaims " Were, then, the Peking and Java man representatives of early Pleistocene humanity in their development of brain ? If so, then evolution must have proceeded rapidly to produce the many large-brained types of man who lived in Europe in the latter third of the Pleistocene period—even if we ascribe to it (the Pleistocene) a duration of a million years, evolutionary changes which converted the brain of Sinanthropus into that of La Chapelle must have proceeded rapidly." In other words, Peking man should have been found in a Miocene deposit. His arrival out of time is awkward, as he, together with this relative Java man, is displaced as a probable ancester of the Heidelberg and Piltdown men.

All these Pleistocene men, from Neanderthal man downwards, have been disqualified as ancestors of modern man by the evolutionists themselves. But so hard pressed are they to find a suitable ancestor that Sir Arthur Keith renews the claim of Piltdown man and puts him forward as a probable ancestor of modern man.

With reference to the relics of extinct apes found in the Pliocene, Miocene and Oligocene, I would like to say that too great importance is paid to the conjectural affinities of these animals by many people.

The remains are few and fragmentary and conclusions based upon them are likely to be found very erroneous in the light of fuller evidence.

Sir Arthur Keith admits the possibility of such mistakes in describing the discovery of Peking man. He expected from the structure of the teeth first found, that the skull would be somewhat of the modern type. He was much disappointed when the skull was unearthed to find that it was a very lowly and apelike one. He proved to be an " amazingly low type."

I think Mr. Dewar's paper shows very clearly that no reliable ancestor of modern man has yet been discovered, either in the Pleistocene or any other period.

The processes of evolution are admitted by evolutionaries to be very slow. The geological record is by no means so poor as it is often made out to be. We already know the fossils of 46·63 per cent. of the living genera of mammals alone. Numerous intermediate forms should have occurred, but they have not come to light. All these facts bear out Mr. Dewar's conclusion that at present Science does not throw any light on when, where and how man originated.

I shall now ask you all to join in a hearty vote of thanks to Mr. Dewar for his most able and useful paper.

Captain ACWORTH, after complimenting the speaker on his very clear exposition, said that it was a scandal that the boys and girls of this country should be taught to believe in the Theory of Organic Evolution as a scientific truth. The scandal was, however, far more widespread than was generally realised, for not only was it propagated in the schools and colleges of the country but also, persistently, through that most powerful agency of propaganda, the B.B.C., which reaches many millions of ordinary men and women. How biased was this Corporation in propagating the Theory of Evolution had become apparent since the meeting held at the Essex Hall on February 12th. Many requests were made at this meeting that the B.B.C. should be asked to allow eminent scientists, theologians and laymen to criticise this theory. It will, therefore, be of interest to you to know that despite evolutionists' denial of bias, Mr. C. A. Siepmann, the Director of Talks, in his reply to a

request from the " Evolution Protest Movement " for the statement of their case, wrote :—

" I am afraid that I can add nothing to my letter of February 22nd, in which I indicated that as far as I could see, there were no prospects of our being able to broadcast talks on the subject of evolution on the lines which you suggest."

This denial of free speech will not be allowed to stop here, and we are now writing to Sir John Reith. If he is unable to give us a satisfactory answer, we shall take the matter to the highest quarters.

The Rev. H. C. MORTON, B.A., Ph.D., said : We are all in Mr. Dewar's debt for a clearly thought, able and useful paper, which it will be advantageous to have at hand for reference in days to come.

If I venture upon anything even approaching criticism it would be just to remark that Mr. Dewar does our evolutionary anthropologists great honour by taking them so seriously—one almost feels too great honour.

I should like to ask two questions. First, Mr. Dewar distinguishes between " Pithecanthropus Erectus " and " Java man." Are not these the same ? And is not a third name sometimes given—" Trinil man " ?

Secondly, I wish Mr. Dewar would explain the ground upon which he thinks that arboreal habits account for the comparative scarcity of the higher primate fossils.

Too many absurdities have been perpetrated by evolutionists to permit of any great respect for their opinion. They jump hastily to evolutionary conclusions. For instance : Some years ago in the Mississippi Valley they were digging the foundations for gas works. When they had gone a certain depth they found a skeleton and, judging by the depth at which they found it, American scientists said it was 50,000 years old. They went on digging deeper and came across a Mississippi flatboat. Then someone remembered that years before a flatboat had been wrecked and a man lost in great floods. So they corrected the 50,000 to 50.

This is an earth subject often to great floods, and that makes quite uncertain the usual estimates of age from depth. Sir Arthur Keith, addressing the British Association on Evolution, specially

stressed the importance of "Piltdown man" and *Pithecanthropus*. But when "Piltdown man" was discovered, Mr. G. W. Wilks hastened to make an investigation of the place of discovery, and found that mixed with the gravel in which the "Piltdown" bones were found, were large flints not native to that locality. Evidently they had been water-borne, and Mr. Wilks made the extremely likely suggestion that, through the gap in the Southdowns to the south of Piltdown, the waters of a mighty flood had swept along the "Piltdown" bone mixed with large flints from the shores south of the Downs. This thick-skulled human being might very well have been one of the Antediluvians, for whose violence the Great Flood was sent upon the earth.

Sir Arthur Keith admitted in regard to *Pithecanthropus*, which consists of a piece of skull and two or three teeth, and also a thigh bone, that the thigh bone might have belonged to a modern man and the skull might have belonged to a modern ape. After these admissions, Sir Arthur Keith drew a conclusion sufficiently remarkable to be borne in memory, viz., that our remote ancestors developed their thigh bones more speedily than their skulls. Such conclusions may suit the evolutionists, but they will be scouted as ridiculous by the man of common sense, who will instead draw the conclusion that the thigh bone (which was found 50 ft. away from the piece of skull and the teeth) belonged to a man, and skull and teeth belonged to an ape.

Mr. Dewar does not make any reference to *Hesperopithecus*. In June, 1922, Sir Grafton Elliott Smith introduced both Mr. and Mrs. Hesperopithecus to the British public by publishing in *The Illustrated London News* a great two-paged picture of Mr. and Mrs. Hesperopithecus—two of our ancestors—walking amid rock scenery, presumably in the State of Nebraska. It was an audacious picture, very realistic, and calculated to give the unsuspecting public the idea that two remarkable skeletons had been found which, clothed with flesh, would look as Professor Elliott Smith depicted them. But the actual fact, in the singular, which was the sole and entire ground for this audacious picture, was that part of one molar tooth had been found in the State of Nebraska which has now been definitely allotted, not to an anthropoid ape of any type whatever, but to a peccary.

Really, the evolutionary view does not deserve to survive these absurdities. Mr. Dewar well concludes: "There is no evidence against the view that man has no pre-human ancestors, but was a special creation," and the mentality of some of the most eminent evolutionists makes us feel very comfortable about that conclusion.

The Rev. HUGH MILLER, M.A., F.Roy.Anth.I., Principal of the London School of Bible Studies, after commending highly the cogent clarity of the lecturer's paper, called attention to the great confusion caused by geological nomenclature never having been scientifically standardised. In any case, we could say with confidence that undoubtedly human remains had never been found in strata earlier than the Pleistocene. But geologists differed widely as to that deposit's sequence in time: some regarding it as the last of the Tertiary division, others as the main part of the Quaternary just below the Recent, or latest, layer.

Again, some writers attempted to date fossil remains by the stage of culture displayed by their associated artifacts, without stating the correlation they claimed to have established between individual eras of culture and particular geological strata. In this instance, also, much confusion arose. A few years ago, anthropologists and ethnologists were content to name some five or six cultural epochs. Now they claimed to have found no fewer than forty-five or fifty. By making these eras follow one another in strict sequence, they had been able to invent an entirely unreasonably prolonged period that had elapsed since man's first appearance upon earth. Judging, however, by the analogy of conditions within the ambit of historic times, many of these cultures must have been not only contemporaneous and parallel but likewise of very limited duration. A good illustration was furnished by the Worora tribe in N.W. Australia. In ritual and cultural procedures they were, even to-day, in a late Palæolithic stage: whereas, in the same area, other people had reached a wireless telephony, rustless steel, and aeroplane level. From another aspect, the same worker, by improving his *technique*, could produce the polished products attributed to the "Neolithic" Age, within a few months or years of his having turned out typical "Palæolithic" ones.

These facts were of great importance; for they showed the fallacy of trying to date exactly fossil remains by reference to artifacts discovered in appropinquity to them, or in the same horizon.

Another alleged reliable factor in age and developmental determination was claimed to be obtainable from studying the internal surfaces of the cranial bones. Great weight was attached to the examination of plaster casts showing the features presented by the interior of a brain-case. But such procedure for obtaining exact data was fallacious, so far as related to the hypothetical " evolution " of mental powers and intelligence from ancestors of inferior biological status. Between the inner aspects of the cranium and the cerebral surfaces were interposed three membranes, between which a considerable quantity of cerebro-spinal fluid constantly circulated. Hence the brain—as an organ—was supported by what might be termed the method of " Cushion Suspension." The means of this was obviously that the interior of the bones indicated nothing more than the extent of the cerebral mass and configuration, in the most general way possible. On the contrary, mental energy, intelligence, and ability—cognition, emotion and conation—depended, so far as identified and known, on the minute structure of the convolutions and cortex-areas. Practical psychology also demonstrated how an apparently microcerebrated man frequently showed powers of mentality much superior to those exhibited by a megalocerebrate.

In the foregoing respects, the " Evolutionist " merely followed a will-o'-the-wisp in solemnly trying to trace the emergence and growth of anthropic psychological potency, from the nervous organization possessed by the lowliest types of living creatures.

Mr. SIDNEY COLLETT said: It is my privilege to propose a very warm vote of thanks to our Chairman for presiding at our gathering this afternoon.

While on my feet, I should like to make a few remarks on this subject of Evolution.

I am sure it must be a source of real satisfaction to all here present to know by what has been said to-day, and especially by Mr. Dewar's masterly paper, that this Evolution theory, even on scientific grounds, has no real foundation in fact, whatever.

There is, however, a much more serious aspect about this matter,

which is not always realised, viz., that it constitutes a subtle and veiled attack upon the fundamental truths of the Bible, and I do not hesitate to say that there is a " smell of the Pit " about it !

Evolutionists plainly say that their teaching and that of the Bible are incompatible, and that if Evolution is right, then the Bible is wrong.

I quote the following few instances to prove my statement :—

Thos. Huxley said, " Evolution, if consistently accepted, makes it impossible to accept the Bible."

Bishop Barnes' words are : " If we accept Evolution, we have to abandon belief in the special creation of Adam in Paradise. We can no longer accept the story of the Fall . . . Man was not specially created by God, as the Jews of old believed, and as is stated in the books of Gensis."

Sir Oliver Lodge has stated the same thing in the following words : " The story of the Fall in the third chapter of Genesis was a crude legend ! "

While *Dean Inge* has stated that : " The doctrine of the ' Fall of Man ' seems to have been borrowed by the Hebrews from their neighbours. . . The old story of man's first disobedience is not science, and it is not exactly history."

Professor D. M. S. Watson, at a meeting of The British Association, said quite bluntly : " Evolution was a theory universally accepted, *not because it could be proved to be true, but because the only alternative, special creation, was clearly incredible.*" !

Now, all this is in spite of the fact that some of the greatest Evolutionists have discovered their mistake and given up the theory. For example, *Professor Haeckel* bewailed the fact that he was left almost alone in advocating evolution, and has left on record the following words :—

" Most modern investigators of Science have come to the conclusion that the doctrine of Evolution, and particularly Darwinism, is an error, and cannot be maintained." He then gives a list of several men whom he terms bold and talented scientists, as having abandoned Evolution !

While *Professor Virchow*, once a foremost world Evolutionist, came to see the folly of this view and said in his lecture on " The

Freedom of Science " : " It is all nonsense ; it cannot be proved by science that man descended from the ape, or from any other animal. Since the announcement of the theory, all real scientific knowledge has proceeded in the opposite direction." ! *

Little do these Evolutionists realize that by propagating their views they are unconsciously supporting the teaching of the infidel Blatchford, who only too truly said : " No Adam, then, No Fall ; No Fall, then no need for Atonement ; no Atonement, then no need of a Saviour " !

No wonder *Carlyle*, in a fit of intolerance, called it " The Damnification of Man." !

Lt.-Col. L. M. DAVIES, M.A., F.R.S.E., F.R.A.I., F.G.S., writes : Mr. Dewar's paper is very timely. All that he says is true. It is impossible to prove man's descent from an ape for many reasons, among which I would particularly emphasise the following :—

1. Primary (*i.e.*, historical) evidence is totally lacking ; and without such evidence Science is powerless to establish a single genetic connection. Sir Arthur Keith is as powerless as anyone else to say who the father of the " Unknown Warrior " was ; and yet he asks us to believe that he can trace the myriads of unknown ancestors connecting some unknown ape with a " first true man," no fraction of whose anatomy has ever been seen by any living person.
2. Every fossil ancestry involves an appeal to negative evidence, although Darwin himself declared that " negative evidence is worthless." At every point, we are asked to believe that the supposed ancestor appeared before the supposed descendant ; although geological support for the idea can only be found in negative pleas to the effect that the latter has not yet been seen in older rocks. The insecurity of such pleas is shown by the way in which forms are continually being discovered at unprecedentedly low levels, as geological research proceeds. Genealogical " trees " are

* Prof. Virchow was elected in 1898 as a Foreign Hon. Correspondent of the *Victoria Institute*.—Ed.

continually having to be scrapped for this reason. Only the other day, I myself demonstrated that a foraminiferal genus, commonly held to have first appeared in the Middle Eocene, was actually in existence before its supposed Cretaceous "ancestors." What Mr. Dewar has shown to be happening in the case of man's evolutionary pedigree is typical of what is happening in the case of all evolutionary pedigrees.

3. Man is, in many ways, more primitive than the apes in details of his bodily structure. It follows that any link between modern man and ape would have to be more specialised, in these respects, than we are; and so could hardly be our ancestor. The difficulty has been clearly seen by many modern anthropologists, including so eminent an authority as Dr. Marcellin Boule, Professor of Palæontology in the Museum of Natural History in Paris, who roundly declares that modern man can have "been derived neither from the Anthropoid stem, nor from any other known group" (*L'Homme fossile de la Chapelle aux-Saints*); in other words, the whole of our evolutionary ancestry is purely imaginary.

With regard to Sir Arthur Keith, who seems to have entered the lists against Sir Ambrose Fleming, I would like to point out that he (Sir Arthur) exhibits a well-marked double personality. It is easy to show that there are two, quite different, Sir Arthur Keiths. The one, whom we may distinguish as Sir Arthur "A," is a man of science, who studies concrete facts with exemplary thoroughness and candour, admitting the existence of difficulties and anomalies in the frankest possible manner. The other, whom we may call Sir Arthur "B," is a materialistic philosopher, a champion of the Rationalist Press, who propounds untenable generalities as unquestionable truths, ignores all that his *alter ego* has allowed, and is as confident and inaccurate as the first Sir Arthur is cautious and reserved.

Thus Sir Arthur "B" asks us why it is, if evolution be not true, that the farther back we go in geological time, the more ape-like do human remains become; but Sir Arthur "A" assures us that

human remains do nothing of the sort. He (Sir Arthur " A ") writes chapter after chapter to prove that modern man is much older than any Neanderthal remains yet found; and assures us that it is only their evolutionary bias which prevents scientists from admitting the vast age of the perfectly modern type remains found at Calaveras, Ipswich, Galley Hill, Clichy, Olmo, Castenedolo, etc., and makes them credit a great age—for which there is no evidence—to the Piltdown fragments. In fact, it was Sir Arthur " A " who wrote that excellent work *The Antiquity of Man*, in which will be found an antidote to nearly everything said by Sir Arthur " B," who is now talking nonsense against Sir Ambrose Fleming. The way in which one member of a composite personality can forget everything admitted by the other, is very curious to note. Dr. Jekyll was no more distinct from Mr. Hyde than Sir Arthur " A " is from Sir Arthur " B."

I have not the space, here, to deal with all the wild assertions made by Sir Arthur " B," but it is typical of him to declare that there is no evidence that our Lord rose from the dead. Sir Arthur " A," like any real scientist, would realise that a serious opponent of the Resurrection must not only deny it in general terms—which any unthinking person can do—but must offer some reasonably possible alternative explanation of the facts. Such an explanation the most subtle intellects opposed to Christianity have notoriously failed to produce; and a mere dogmatic generaliser like Sir Arthur " B " is the last person likely to achieve the feat. It is easy to show that, as Sir Ambrose Fleming says, the Resurrection of our Lord is the best attested fact in all human history; and the God Who could raise His own Son from the dead could also literally create.

Lecturer's Reply.

In reply to Dr. Morton, the name *Homo javensis* or *H. soloensis* is, I believe, that given to the thigh bone and teeth which form part of the finds which most authorities include in *Pithecanthropus*. The brain-case is very unhuman, while the thigh is very human, and, as some of the fragments were found as much as 20 yards apart, some authorities believe that the former is part of an ape and the latter part of a man. This view is strengthened by the fact that

remains of very ancient big-brained men have been found in Java, not far from Trinil—the Wadjak men. Indeed, these were found by Dubois, the discoverer of the *Pithecanthropus* fossil, but, although he proclaimed the discovery of the last immediately on his return from Java in 1924, he did not make any mention of the Wadjak fossils until twenty-six years later !

Arboreal animals are less liable to meet with death accompanied by immediate burial and so become fossilised than are creatures that keep to the ground. Thus, while fossils have been found of nearly 80 per cent. of living genera of hoofed animals (Ungulates), only 40 per cent. of the Primates are known as fossils, while in bats the percentage is less than 20.

Perhaps I may be permitted to add the following touch to Dr. Morton's mention of *Hesperopithecus*. At the time of the discovery of this tooth, Bryan was fulminating in the U.S.A. against the iniquity of teaching school children that evolution is a fact. Professor H. F. Osborn made the discovery of this tooth the occasion of rebuking Bryan ; he said : " The earth spoke to Bryan from his own State of Nebraska. The *Hesperopithecus* tooth is like the still small voice ; its sound is by no means easy to hear . . . this little tooth speaks volumes of truth." Osborn, however, misheard its message !

That was not the first time a scientific man had made a mistake in assigning a solitary tooth to the proper species. In 1840, Owen definitely said that a molar found in an Eocene bed of Suffolk was that of a *Macacus* monkey ; in fact, it was that of an extinct horse. It is important to bear this in mind, in view of the fact that a number of Primate fossils consist of solitary teeth.

I agree with Mr. Miller that it is absurd to assume that all the cultures of which traces have been discovered in any locality are of different periods. Were this a fact the great majority of convenient caves occupied by men should exhibit evidence of occupation by men of each culture. In fact, rarely does a cave show signs of more than four successive human occupations. The anthropologist, unlike the geologist, cannot call in erosion to explain missing deposits in any cave.

Captain Acworth's correspondence with the B.B.C. illustrates the manner in which those who believe in evolution dominate the

usual organs of publicity; it is not easy for their opponents to get their views before the public.

I agree with Captain Acworth and Mr. Collett that the teaching of evolution as a fact in schools is doing much harm. All Evolutionists, however, do not assert that their doctrine is incompatible with the teaching of the Bible; many, notably the Modernist theologians, attempt to reconcile the two. Quite apart from Biblical teaching, in my opinion, Evolution can be demonstrated to be a false doctrine on purely scientific grounds.

789TH ORDINARY GENERAL MEETING

HELD IN THE CONFERENCE HALL, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, APRIL 8TH, 1935, AT 5.30 P.M.

W. N. DELEVINGNE, Esq., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed, and the HON. SECRETARY announced the election of J. Rowland Crook, Esq., O.B.E., as a Member, and James B. Nicholson and the Rev. Leslie F. E. Wilkinson, M.A., as Associates.

The CHAIRMAN then called on Mr. R. Duncan to read the Rev. Dr. S. M. Zwemer's paper, which he had kindly offered to do in the absence of the author, the title of the paper being " The Origin of Religion—by Evolution or by Revelation."

THE ORIGIN OF RELIGION—BY EVOLUTION OR BY REVELATION.

By PROFESSOR SAMUEL M. ZWEMER, D.D.

IN the sixteenth edition of a popular account of the great religions of mankind, Lewis Browne relates in the prologue how it all began :

" In the beginning there was fear ; and fear was in the heart of man ; and fear controlled man. At every turn it whelmed over him, leaving him no moment of ease. With the wild soughing of the wind it swept through him ; with the crashing of the thunder and the growling of lurking beasts. All the days of man were gray with fear, because all his universe seemed charged with danger . . . And he, poor gibbering half-ape, nursing his wound in some draughty cave, could only tremble with fear." *

The evolutionary hypothesis seems to have the right-of-way not only in such popular works by non-Christians but with

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* *This Believing World*, 16th Edition, p. 26.

Christian writers as well. We quote from two recent works on the study of the history of religion: "There was a belief once that religion began with a full knowledge of one true God and that thereafter through human fault and disobedience the light of the first splendid vision was clouded or lost. But this is not the story told by the assembled records. The story of religion is not a recessional. The worship of sticks and stones is not religion fallen into the dark; it is religion rising out of the dark. The procession of the gods has been an advance and not a retreat. The faiths of the dark and the dawn are not 'a sleep and a forgetting;' they are man's religious awakening and his first suppliant gesture toward the unseen. Why did he make the gesture?"* While Professor E. D. Soper in his *Religions of Mankind* puts it even more frankly:

"Christians, Jews, and Mohammedans alike assumed a primitive divine revelation, and that settled the whole question. They conceived that in the beginning—that means when the first man was created and placed in the Garden of Eden—God revealed to him in some manner the essential truths of religion, such as the existence of one God, the obligation to obey him, and the hope of immortality. Thus furnished, he began his career, but when sin emerged the revelation became hazy and indistinct and finally was well-nigh if not completely lost. The difficulty with this exceedingly fascinating picture is that it rests on no solid foundation of fact. The Bible makes no clear statement which would lead to this conclusion. When man began to play his part he performed religious acts and engaged at times in a religious ritual; so much is evident, but nothing is said as to origins. That man received his religious nature from God is very plausible, but that differs widely from the statement that he came into life furnished with a full set of religious ideas. The theory of evolution presents us with a very different account of early man, an account which makes belief in a more or less complete revelation incongruous."†

According to writers of this school, the Hebrew religion itself is entirely due to a process of evolution. Yahweh was from time immemorial the tribal god of the Midianites and his abode was Mount Sinai. From the Kenite priest, Jethro, Moses gained the knowledge of Yahweh. So the later covenant at Sinai is

* Professor G. S. Atkins, *Procession of the Gods*, p. 5.

† Professor E. D. Soper, *Religions of Mankind*, pp. 29-30.

presented in the form that Israel chose Yahweh not that Yahweh chose Israel. Volcanic phenomena account for the terrors at the giving of the Law. There was an ancient pastoral feast called Passover, and it is not impossible that a form of the seventh day Sabbath was imposed. "Beyond these points it is hardly possible even to hazard a conjecture." Later on, much later on, the prophets proclaimed a higher conception of deity as Lord of all and a universal morality.* Here again we have the hypothesis of evolution applied to the documents and teaching of the Old Testament, and the argument has become familiar.

But the verdict is not unanimous. In a recent important work by Dr. Israel Rabin, entitled *Studien zur Vormosaischen Gottesvortellung*, this orthodox Jew protests against the view that monotheism was a later development in Israel and that it was preceded by polytheism and animism. Not only Moses, he says, but the Patriarchs were already monotheists. "The Covenant idea is as old as Abraham, and the Covenant at Sinai is history, not fiction. The God of Sinai is no mere mountain-god or local Kenite god. Monotheism is not the result of an evolutionary process, it rests upon revelation and existed from the beginning of Israel's history as portrayed in Genesis; there is no bridge from polytheism to monotheism." There is no bridge from polytheism to monotheism unless it be for one-way traffic across the chasm in the other direction. For those who accept the Old Testament and the New Testament as the word of God the idea of primitive monotheism seems self-evident. On the first page of Genesis we have the self-revelation of God, and the New Testament takes for granted the genuineness of this revelation. Those who reject the story of man's Creation and the Fall with the promise of Redemption can no longer take seriously the argument of the Apostle Paul in his epistles to the Romans and to the Corinthians. This paper, however, is not intended as a Biblical study on the origin of religion.

In the history of religion and in the study of the origin of the idea of God, the neglected factors are coming to their own. Entirely apart from the teaching of the early chapters in Genesis and Paul's statement in the first chapter of Romans, the evidence for primitive high gods and for early monotheism in the ethnic religions cannot be longer ignored. Recent scholarship on both

* W. O. E. Oesterley and Theodore Robinson, *Hebrew Religion: Its Origin and Development*, pp. 4-16, 22, 23, 175, etc.

sides of the Atlantic agrees that not evolution but innate knowledge, or a revelation, is the key to the origin of the idea of God, of immortality and of the rites of prayer and sacrifice.

The first modern writer to emphasize the fact that monotheistic ideas were found among primitive races and must be taken into account was Andrew Lang in his book, *The Making of Religion.* In 1924 Redan delivered an address before the Jewish Historical Society on monotheism among primitive peoples, in which he also rejected the evolutionary hypothesis. "Most of us," said he, "have been brought up in or influenced by the tenets of orthodox ethnology and this was largely an enthusiastic and quite uncritical attempt to apply the Darwinian theory of evolution to the facts of social experience. Many ethnologists, sociologists, and psychologists still persist in this endeavour. No progress will ever be achieved, however, until scholars rid themselves, once and for all, of the curious notion that everything possesses an evolutionary history; until they realize that certain ideas and certain concepts are as ultimate for man as a social being, as specific physiological reactions are for him as a biological entity."*

It is encouraging to note that the tide has turned and that we have, especially on the European continent, outstanding scholars in this field who hold fast to supernaturalism and are opposed to the evolutionary hypothesis as the sole key to the history of religion. Among them we may mention the late Archbishop Söderblom, of Sweden, Alfred Bertholet and Edward Lehman, Alfred Blum-Ernst, Le Roy, Albert C. Kruijt, but especially P. Wilhelm Schmidt, founder of the anthropological review, *Anthropos,* and Professor of Ethnology and Philology in the University of Vienna. The exhaustive work of this Roman Catholic savant on the Origin of the Idea of God, *Der Ursprung der Gottesidee,* is to be completed in eight massive volumes. In the five which have already appeared, he weighs in the balance the various theories of Lubbock, Spencer, Tylor, Andrew Lang, Frazer, and others, and finds them all wanting. The idea of God, he concludes, did not come by evolution but by revelation, and the evidence massed together, analysed and sifted with scholarly acumen, is altogether convincing.

Anthropology and ethnology are also swinging away from the old evolutionary concept as regards primitive races. Dr.

* Andrew Lang, *The Making of Religion.*

Robert H. Lowie of the American Museum of Natural History, in his recent important study on Primitive Society, says, " The time has come for eschewing the all-embracing and baseless theories of yore and to settle down to sober historical research. The Africans did not pass from a Stone Age to an Age of Copper and Bronze and then to an Iron age . . . they passed directly from stone tools to the manufacture of iron tools."*

He concludes " that neither morphologically nor dynamically can social life be said to have progressed from a stone of savagery to a stage of enlightenment." The American public is to be congratulated that the exhaustive work of Wilhelm Schmidt has now appeared in a greatly abbreviated form, and, translated from the original German, is available as a study text-book on the History of Religion.† Whatever may be the reaction of students of anthropology to a doctrine alien to the tradition still prevailing among many scholars, it will do no harm to face the arguments here presented with such force and apparently so well documented. The London *Times Literary Supplement*, in reviewing the book at considerable length, did so under the title, " Evolution or Eden." It is inevitable that Dr. Schmidt divides investigators of the history of religion into two classess—the believing and the unbelieving. By the latter he means those scholars who have themselves repudiated all faith in the supernatural, and " will talk of religion as a blind man might of colours, or one totally devoid of hearing of a beautiful musical composition."

The work before us is divided into five parts : The introduction deals with the nature, aim, and methods of comparative study of religion and the history of the subject. Part Two sketches the theories that were in vogue during the nineteenth century ; namely, those that found the origin of religion in Nature-Myths, Fetishism, Manism or Ghost-Worship and Animism. Part Three deals with the twentieth century, and sketches the Pan-Babylonian theory, Totemism, Magianism, and Dynamism. In every case Dr. Schmidt gives an exposition of these various theories and a refutation of them based upon more accurate data from later investigations.

In Part Four we have an account of the supreme Sky-God whose existence was posited by Andrew Lang and others. It appears

* Dr. Robert H. Lowie, *Primitive Society* (13th Edition, N.Y., pp. 436, 437).

† *The Origin and Growth of Religion : Facts and Theories*, by W. Schmidt. Translated by H. J. Rose. The Dial Press, N.Y., 1931, pp. 297.

that during the twentieth century there has been a progressive recognition of the primitive high God by European and American students of ethnology and religion. This protest against the evolutionary theory applies not only to the religion of primitives but to those who find the same development in the religion of the Old Testament.

Dr. Schmidt follows the historical method, and traces the belief in a supreme God across wide areas where primitive culture prevails; for example, among the Pygmies of Africa, the Indians of North America, and certain tribes in Australia. The last chapter of this epoch-making book is entitled, "The Origin and History of the Primitive High God," in which we have the summary of the argument. "That the Supreme Being of the primitive culture is really the god of monotheism, and that the religion which includes him is genuinely monotheistic—this is the position which is most attacked by a number of authors. To this attack we may reply that there is a sufficient number of tribes among whom the really monotheistic character of their Supreme Being is clear even to a cursory examination. This is true of the Supreme Being of most Pygmy tribes, so far as we know them; also of the Tierra del Fuegians, the primitive Bushmen, the Kurnai, Kulin and Yuin of South-East Australia, the peoples of the Arctic culture, except the Koryaks, and well-nigh all the primitives of North America."

Again, in massing the evidence for the character of this Supreme Being, he says, "The name 'father' is applied to the Supreme Being in every single area of the primitive culture when He is addressed or appealed to. It seems, therefore, that we may consider it primeval and proper to the oldest primitive culture. We find it in the form 'father' simply, also in the individual form ('my father') and the collective ('our father'). So far, this name has not been discovered among the Central African Pygmies, but it exists among the Bushmen and the Mountain Dama. It is lacking also among the Andamanese and the Philippine Negritos, but is found, although not commonly, among the Semang. Among the Samoyeds we find the formula 'my Num-father,' *i.e.*, sky-father. In North Central California, the name occurs among the Pomo and the Patwin; all three forms of it are widely distributed among the Algonkins. It is also widely current among the two oldest Tierra del Fugeian tribes, the Yamanan and the Halakwulup, who use the form

'my father.' Among all the tribes of South-East Australia it is in common use, in the form 'our father.' There it is the oldest name of all, and even the women and children know it; the oldest of the tribes, the Kurnai, have no other name for Him. There is no doubt possible that the name 'father' is intended in this connection to denote, not physiological paternity (save in cases where the figures of the Supreme Being and of the First Father have coalesced) but an attitude of the greatest reverence, of tender affection and steadfast trust on the part of man towards his god."

The evidence for these astonishing statements is abundantly given in the larger eight-volume work, to which we have already referred. In his lectures on High Gods in North America, given at Oxford last year, Dr. Schmidt gives evidence for his view that the gods of these tribes were true gods with moral attributes, and that their beliefs possess a high religious value. Incidentally he proves that this pure religious faith comes *before* fetishism, animism, ghost-worship, totemism, or magism, from one or other of which evolution theories had derived the origin of religion. The Professor claims to have made it clear by his discoveries that "progressive evolution is not the key which opens the door to a true history of humanity, and consequently of man's religion." The peoples ethnologically oldest know nothing of totemism or any similar phenomena, but emphasise in their religion the creative power of the Supreme Being. Not evolution, but deterioration, is found in the history of religion among primitive tribes and the higher cultures that followed after their migration. As Dr. Schmidt expresses it in the concluding paragraphs of his earlier volume: "Thereafter, as external civilization increased in splendour and wealth, so religion came to be expressed in forms of ever-increasing magnificence and opulence. Images of gods and daimones multiplied to an extent which defies all classification. Wealthy temples, shrines and groves arose; more priests and servants, more sacrifices and ceremonies were instituted. But all this cannot blind us to the fact that despite the glory and wealth of the outward form, the inner kernel of religion often disappeared and its essential strength was weakened. The results of this, both moral and social, were anything but desirable, leading to extreme degradation and even to the deification of the immoral and anti-social. The principal cause of this corruption was that the figure of the Supreme Being was sinking

further and further into the background, hidden beneath the impenetrable phalanx of the thousand new gods and daimones.

"But all the while, the ancient primitive religion still continued among the few remainders of the primitive culture, preserved by fragmentary peoples driven into the most distant regions. Yet in their condition of stagnation, poverty and insignificance, even there it must necessarily have lost much of its power and greatness, so that even among such peoples it is much too late to find a true image of the faith of really primitive men."

It is of deep interest to note, also, that the question of primitive monotheism raised by Dr. Schmidt is now being carefully investigated by a number of German missionaries under the direction of Dr. Heinrich Frick, of Marburg. In *Africa*, a journal of the International Institute of African Languages and Cultures (July, 1931), London, Professor Dr. K. T. Preuss, of the University of Berlin, has a striking article on the conceptions of a Supreme Deity among primitive peoples, and his conclusions corroborate those of Dr. Schmidt. The reader may, however, ask whether Dr. Schmidt speaks with authority in this realm of knowledge or whether he is merely voicing the old orthodoxy of the Roman Catholic Church and, in this case, of evangelical Christianity. The answer is that in all of the volumes so far issued Dr. Schmidt makes no appeal to the Scriptures and (writing from the standpoint of anthropological science) gives no Scriptural references. He bases his whole argument on the data gathered by scores of observers and scholars who lived among Primitives. Father Wilhelm Schmidt is the most renowned of the group of scholars resident at St. Gabriel Scientific Institute in the suburbs of Vienna. A Westphalian, sixty-six years of age, he began to publish important studies on the South Sea languages as early as 1889. He founded *Anthropos*, the outstanding international review of ethnology and linguistics in 1906, and was for twenty years its editor. He has written 150 books and pamphlets on scientific subjects and is an acknowledged authority in Europe and America.* The only attempt I have seen to reply to his arguments in *Der Ursprung der Gottesidee* is by a Dutch scholar, Dr. J. J. Fahrenfort, of Groningen University, in his book *Het Hoogste Wezen der Primitieven.*† He contends

* *The Catholic World*, April, 1933, gives a sketch of his work, and a *Festschrift* published in his honour (Vienna, 1928) gives a list of all his publications.

† J. B. Wolters, The Hague, 1927, pp. 307.

that the evidence for primitive monotheism given by Dr. Schmidt is inadequate and that his argument is based on pre-suppositions. But his thesis received a crushing reply by Dr. Schmidt in a paper published under the title, *Ein Versuch zur Rettung des Evolutionismus* (An Attempt to save Evolution), in the International Archiv für Ethnograpie (Band XXIX, Heft IV–VI Leiden, 1928).*

But Dr. Schmidt is not the first or only authority on primitive monotheism over against other theories for the origin of religion. Fifty years ago Dr. Francis L. Patton summed up the argument for his day ("The Origin of Theism," *Presbyterian Review*, October, 1882): "It is more important to note the fact that, aside from the declarations of Scripture upon the subject, there is good reason to believe that Monotheism was the primitive religion. And it is certainly true that polytheism, fetishism, and idolatry are corruptions of an earlier and purer faith. 'Five thousand years ago the Chinese were monotheists—not henotheists, but monotheists; and this monotheism was in danger of being corrupted, as we have seen, by a nature-worship on the one hand, and by a system of superstitious divination on the other.' So says Dr. Legge. And says M. Emmanuel Rouge: 'The first characteristic of the religion of ancient Egypt is the unity of God, most energetically expressed.' Says Le Page Renouf: 'The gods of the Egyptian, as well as those of the Indian, Greek, or Teutonic mythologies, were the "powers" of nature, the "strong ones," whose might was seen and felt to be irresistible, yet so constant, unchanging, and orderly in its operations as to leave no doubt as to the presence of an ever-living and active intelligence.' Says Professor Grimm: 'The monotheistic form appears to be the more ancient, and that out of which antiquity in its infancy formed polytheism . . . All mythologies lead us to this conclusion.' This, too, was once the belief of Max Muller, though, as has been shown, his opinions seem to have undergone a change under the pressure of a demand that religion shall be accounted for as a product of man's five senses. 'The more we go back, the more we examine the earliest germs of any religion, the purer, I believe, we shall find the conceptions of the Deity, the nobler the purposes of each founder of a new worship."†

* Dr. Fahrenfort replied in a pamphlet "Wie der Urmonotheismus am Leben erhalten wird" (Haag, 1930).

† *The Presbyterian Review*, October, 1882.

Stephen H. Langdon, of Oxford, comes to the same conclusion in a recent book dealing with the whole question of the origin of Semitic mythology.* His conclusions are the more worthy of note because they represent the result of thorough investigation and are a complete denial of the earlier theories of W. Robertson Smith.

"After long study of the Semitic and Sumerian sources, I have become convinced that totemism and demonology have nothing to do with the origins of Sumerian or Semitic religions. The former cannot be proved at all; the latter is a secondary aspect of them. I may fail to carry conviction in concluding that, both in Sumerian and Semitic religions, monotheism preceded polytheism and belief in good and evil spirits. The evidence and reasons for the conclusion, so contrary to accepted and current views, have been set down with care and with the perception of adverse criticism. It is, I trust, the conclusion of knowledge and not of audacious preconception.

"The Semitic word for 'god' meant originally, 'he who is high,' a sky-god; and here also I believe that their religion began with monotheism; they probably worshipped El, Ilāh, as their first deity, a sky-god, corresponding to the Babylonian Anu, and the Greek Zeus . . . In the minds of the earliest Sumerians *dinger* Enlil, *dingir* Enki, etc., really mean An-Enlil, An-Enki, etc., that is, Enil, Enki, etc., are only aspects of the father Anu. On seals of the pictographic tablets and on painted pots of that prehistoric period, the picture of a star constantly occurs. This star sign is almost the only religious symbol in this primitive age. *These facts cannot be explained without assuming monotheism in the beginning.*"

The fact is that the evolutionary theory as an explanation of the history is more and more being abandoned. It has raised more difficulties than it has explained. Professor Dr. J. Huizenga, of Utrecht University, gave an address on the history of human culture in which he actually defended this thesis: "The evolutionary theory has been a liability and not an asset in the scientific treatment of the history of civilization."†

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* *Cf. The Mythology of all Races*, Vol. V, Semitic, Stephen Herbert Langdon, M.A. (pp. xviii, 93). (London, 1931.)

† Quoted in Alkema and Bezemer's *Volkenkunde van Nederlandsh Indie* (Haarlem, 1927), p. 134. *Cf.* the entire chapter on "Degeneration" in this important work on primitive tribes.

The degeneration theory (that is, in Scriptural language, the fall of man) is gaining adherents among ethnologists who are not theologians. Among them is R. R. Marett, who speaks of ups and downs in the history of religion and whose recent lectures on Faith, Hope and Charity in Primitive Religion are the very opposite of proof for the evolution of the religious idea. Not only was incest a crime but monogamy was the earliest form of marriage among the most primitive tribes. Primitive man believed in immortality and, after a fashion, in a world beyond. "Neanderthal man, to whom we grudge the name of *Homo sapiens*," says Marett, "achieved a future life. There can be no question, I think, that the experts are right in attributing to him deliberate burials with due provision for a hereafter. It is even noticeable that funeral custom is already beyond its earliest stage. At La Chapelle-aux-Saints, for instance, not only is the grave neatly dug and food laid by conveniently, but a cave too small for habitation has evidently been selected for a purely sepulchral purpose. If there was a time when the dead man was simply left lying by himself within his own cave-home, or when, perhaps, the dying man was prematurely abandoned, we are well past it."

Dr. Carl Clemen also finds evidence for religion during the palæolithic period, such as belief in a future life, sacrifice, etc.,* while in his latest book on the Fear of the Dead in Primitive Religion, Sir James G. Frazer uses these remarkable words:

"Men commonly believe that their conscious being will not end at death, but that it will be continued for an indefinite time or for ever, long after the frail corporeal envelope which lodged it for a time has mouldered in the dust. This belief in the immortality of the soul, as we call it, is by no means confined to the adherents of those great historical religions which are now professed by the most civilized nations of the world; it is held with at least equal confidence by most, if not all, of those peoples of lower culture whom we call savages or barbarians, and there is every reason to think that among them the belief is native; in other words, that it originated among them in a stage of savagery at least as low as that which they now occupy, and that it has been handed down among them from generation to generation without being materially modified by contact with

* *Urgeschichtliche Religion.* Boon, 1932.

races at higher levels of culture. It is therefore a mistake to suppose that the hope of immortality after death was first revealed to mankind by the founders of the great historical religions, Buddhism, Christianity and Islam ; to all appearance, it was cherished by men all over the world thousands of years before Buddha, Jesus Christ and Mohammed were born."

If we have belief in immortality, faith, hope and love, knowledge of a High-god or Sky-god and conscience with its taboos and dread of judgement (and all this anthropology now admits in primitive religion), how does that primitive man of ethnology psychologically differ from Adam in the Garden of Eden as portrayed in the Book of Genesis ?

Professor Le Roy, after twenty years among the tribes of Africa, states that " when you have lived with primitives a long time, when you have come to be accepted as one of them, entering into their life and mentality, and are acquainted with their language, practices and beliefs, you reach the conclusion that behind what is called their naturism, animism or fetishism, everywhere there rises up real and living, though often more or less veiled, the notion of a higher God, above men, names, spirits and all the forces of nature. Other beliefs are variable, like the ceremonies attached to them, but this one is universal and fundamental."*

Schmidt and Le Roy have found disciples. In the valuable Bibliotheque Catholique des Sciences Religieuses a volume has just appeared on Polytheism and Fetishism written by a Roman Catholic missionary in West Africa ; it closes with a chapter on primitive revelation. The religion of primitive tribes in West Africa, the author says, always includes five elements, all of which are impossible to explain without accepting the fact that *God has spoken* (Heb. i, 1). These five elements are : An organised family life ; a name for a supreme, unseen Power, sovereign and benevolent ; a moral sense, namely, of truth, justice, shame and a knowledge that there is good and evil ; the idea of " soul " in every African language and the universal belief that this soul does not die with the death of the body ; and, finally, communion with the unseen Supreme Power by prayer and sacrificial rites. " Devant ces considerations l'hypothese de la Revelation primitive

* Religion of the Primitives. *Cf.* Paul Radin, *Monotheism Among Primitive Peoples.* London, 1924, pp. 65–67, and R. E. Dennett, *At the Back of the Black Man's Mind.* London, 1906, p. 168.

prend bien de les vraisemblance."* Before such considerations the hypothesis of a primitive revelation takes on every appearance of truth.

The evolution hypothesis in religion has been overworked, and has seriously embarrassed students of religion who have grappled with the problem of sin, its universality, and the universality of its correlate, namely, *conscience*, that is a sense of sin as a subjective reality. In the history of religion, and in the study of the origin of the idea of God, scientists may no longer neglect the early chapters of Genesis and the statement of the Apostle Paul in the first chapter of his epistle to the Romans. Revelation, and not evolution, is the key to the origin of the idea of God, of prayer, of sacrifice, and of conscience.

In this connection I quote words from the late Dr. Alexander Whyte. In his interesting series of studies on Bible characters in the first volume, speaking of Adam, he takes up the question of evolution and makes a clear distinction between biological evolution in the realm of science and evolution as an attempt to explain origins in religion. I believe that this distinction should be carefully observed. *The two problems in anthropology to which evolution has no solution are those of the origin of sin and the conscience on the one hand, and* the other the origin of the Sinless One and redemption. Here follow the weighty words of Dr. Whyte:

> "As we are carried away by the spell of the great writers on evolution, we feel all the time that, after all has been told, there is still something unrecognized and undescribed from which we suffer the most disturbing and injurious influences. All the time we feel in ourselves a backward, sideward, downward, perverse pull under which we reel and stagger continually; it is an experience that makes us wiser than all our teachers in some of the most obscure, but at the same time some of the most certain matters of mankind and their spiritual history. Speaking for myself, as I read the great books of our modern scientific men with a delight and an advantage I cannot put enough words upon, I always miss in them—in them all and in the best of them all—a matter of more importance to me than all else they tell me. For, all the time I am reading their fascinating discoveries and speculations, I still feel in

* R. P. M. Briault—*Polytheisme et Fetichisme*, Paris, 1929, pp. 191–5.

myself a disturbance, a disorder, a dis-harmony, and a positive dislocation from the moral, and even from the material, order of the universe around me and above me: a disorder and a dislocation that my scientific teachers neither acknowledge nor leave room for its acknowledgment or redress. That is magnificent! That is noble! That is divine! I exclaim as I read. But when I come to the end of my reading—Is that all? I ask. I am compelled by all my experience and all my observation to ask, Is that all? Is that your very last word to me? Then, if that is all, I must go still in search of a philosophy of nature and of man that understands me, and accounts for me, and has, if so be, a more comprehensive, a more scientific, a more profound, and a more consoling message to me. In one word, and to speak out of the whole of my disappointment and complaint in one word, What about SIN? What is SIN? When and where did SIN enter in the evolution of the human race and seize in this deadly way on the human heart? Why do you all so avoid and shut your eyes to SIN? And, still more, what about JESUS CHRIST? Why do I find nothing in your best text-books about HIM who was WITHOUT SIN? About Him who is more to me, and to so many more of your best readers, than all Nature, and all her suns, and systems, and laws, and processes put together? Far more. For He has carried both our understanding and our imagination and our heart so absolutely captive that we cannot read with our whole heart the best book you have written because His name is not in it. WHO and WHAT is HE, we insist, who has leapt at a bound above all law and all order of matter and of mind, and of cosmic and ethic evolution, and has taken His stand of holiness at the head of the human race?"

DISCUSSION.

Mr. W. N. DELEVINGNE said: I am sure you will think with me that our hearty thanks are due to Professor Zwemer for his extremely interesting paper. The title of the paper, if we amplify it somewhat, may be expressed thus—"Did God reveal Himself to man in the beginning, so that the earliest religion of man was monotheism, or has religion as we see it to-day been evolved from a crude and debased belief in the Supernatural?" When

it is expressed thus, it suggests at once that the view that the earliest form of religion among men was a debased belief in the supernatural has been adopted by evolutionists in order to make the facts relating to the spiritual experience of mankind fit in with their theory of evolution. As may be gathered from the paper before us, the evidence bearing on the question so lucidly discussed by the author is not extensive; but such evidence as is to be found in the religions or mythologies of primitive races points unmistakably to monotheism as having been the earliest form of religion. Take, for example, the system of religious beliefs embodied in Hinduism and regarding which we have more information than in the case of any of the earliest forms of religion excepting that of the Hebrews. From the history of the development of religious belief among the Hindus it is clear that, according to the earliest belief, there was one god, Brahmā, who was the All and the All-in-All, the creator of all things, the gods Vishnu and Siva being merely different aspects of his creative energy. The polytheistic beliefs that are characteristic of modern Hinduism are a much later development and mark rather the debasement of Hindu religion.

Again, look at Islam, the religion of the Muhammadans. It is beyond dispute that, if it had any connection with or was influenced by any earlier form of religious belief, it was from the religion of the Jews that it drew its inspiration, and the religion of the Jews was undoubtedly monotheistic. Muhammad himself claimed that his revelation was confirmed by the Jewish and Christian scriptures, and so far from Islam being a product of evolution it is most probable that it resulted from the spread of Christianity and was an adaptation of Jewish belief that had as its object partly the personal ascendancy of Muhammad among his fellow Arabs and partly the accommodation of religious belief to the natural desires and pride of man.

The records of the history of Man that have survived favour the view that the primitive religion of man was monotheism. Dr. Schmidt, of Vienna, whose writings Professor Zwemer has referred to and discussed, has made extensive researches among the different races of the world, and the results of his investigations have been such as to afford convincing evidence that "The Supreme Being of the primitive culture was the god of monotheism."

When we turn to the Bible, we find in it, if we accept it as a true record, incontrovertible evidence that religion came by revelation, not by evolution. It shows clearly how man, through sin, fell away from pure monotheism and invented for himself many and various gods. God called Abram out of Ur that He might make of him a people for Himself. Idolatry was practised in Ur, but there can be no doubt that God had been known as Yah, or Jehovah, before that, and that He had not left Himself without witness among men. It has been the fashion of the so-called "higher critics" and modernists to impugn the authorship and even the authenticity of parts of the Bible, but their attempts have ended in failure. What is thought of their methods by those most competent to judge has been shown in a remarkable way in an action which a Canadian lady, Miss Florence Deeks, brought for damages against the well-known writer, Mr. H. G. Wells, on the ground that he had appropriated many parts of a book she was writing and had incorporated them in his own book—*The Outline of History*. In support of her claim two Bible "higher critics" of repute were called to give evidence and to show, by the application of the methods of the "higher criticism," that many parts of *The Outline of History* had been reproduced direct from the manuscript of the plaintiff's book. But it all ended in smoke. The trial Judge and the Appellate Division of the Supreme Court of Ontario characterised the arguments and conclusions of these witnesses as puerile, and "just solemn nonsense," and "fantastic hypotheses," and their evidence was rejected as utterly worthless; while the Privy Council in England, before whom the case was finally brought, summarily dismissed the appeal with the remark that the evidence with which they were concerned was no evidence at all and ought not to have been allowed to be presented to the Trial Court.

The Bible stands unassailable, but there are two most cogent facts which, in conclusion, I would like to urge in support of Professor Zwemer's argument that the origin of religion is to be found in revelation and not in evolution. The first is that those who uphold the view that religion as we know it to-day came by evolution have failed to prove that any race of men in the whole course of human history have, in regard to their religious beliefs,

progressed from animism, polytheism, or some such debased form of religion to the monotheism that is to-day admitted to be the highest form of religion. And the second is that the existence of Jesus Christ, the One Perfect Man, standing wholly apart from all who went before and all who have come after, is utterly inexplicable on the assumption that the theory of evolution is true. That God created man and made him in His own image—this is the only hypothesis on which the record we have of Jesus Christ in the Bible can be explained.

Mr. Percy O. Ruoff said: It has been acutely observed that the first chapters of Genesis were either conceived by man or revealed by God. If they were conceived the orderly conceptions are sublime, and it may be as difficult to think of them as arising out of the mind as a product of thinking as it is to think of them as having been revealed by God and communicated to the writer. It is not easy to reconcile Genesis i with the theory of the evolution of man, and it may be said with some confidence that it is impossible to square it with the idea of the evolution of religion.

Recent archæological discoveries have proved the genuineness of the Genesis and other early Biblical records, and these records, if correctly interpreted, make out an irrefragable case for monotheism.

Professor Zwemer has certainly made out a strong case against the evolutionary theory of religion, and, weighing up the probabilities of the matter, the conclusion seems inevitable (to quote his own words) that "it has raised more difficulties than it has explained."

Mr. Sidney Collett said: I am sure we must all feel that our Council have done well in bringing forward this subject of Evolution so frequently lately. The two papers recently read have been of a very high order.

Whichever way this matter is looked at, it is condemned:—

Firstly.—Some of our leading scientists have shown that it is an unproven theory. Sir George Stokes is an honoured name in the scientific world. In his memoir, his biographer uses these words: "Sir George Stokes said that he could not understand the way in which scientific men had accepted the theory of evolution before the

chain of evidence was completed. This surprised him exceedingly, for he knew of no similar instance in the history of scientific thought."

Professor Henslow asserts, in 60 pages of scientific reasons, that "there are no facts known to occur in nature in support of Darwinism," while Professor Bateson said "the more our knowledge is extended, the more incompatible does the theory of evolution become with the facts."

Secondly.—The theory, on their own showing, constitutes a direct attack on Holy Scripture.

Professor Schäfer, President of the British Association at Dundee, used these words:—"If the terms of life given in the purely mythological part of the Old Testament were credible" (certain things, he said, would happen); but he then goes on to say "Such records are no longer accepted . . . . they have been relegated, with the account of the Creation and the Deluge, to their proper position in literature."!

Thirdly.—One verse alone in Scripture forever condemns that foolish theory, for if there were any truth in the view that man really came from the lower animal, then the flesh of man, and the flesh of beasts must be the same; but in I Cor. xv, 39, we read these clear and unmistakable words:—"All flesh is *not* the same flesh, but there is one kind of flesh of man, another flesh of beasts."!

Moreover, the erect attitude, intelligent speech, and the knowledge of God, which man alone possesses, forever separates between man and the lower animals. So that, from a scientific point of view, from a scriptural point of view, and on the ground of common sense, the theory of evolution stands utterly condemned.

Mr. GEORGE BREWER said: The suggestion of some modern theologians that all religion is the result of an evolutionary process rising through the more degrading forms of animism, totemism and polytheism to monotheism is not confirmed by sacred or profane history, nor is it by modern experience.

The history of man as recorded in the Bible reveals that after the Fall degeneracy quickly followed; the first generation producing the first murderer; that the descendents of Seth, who for a time retained the knowledge of God, mingled with the seed of Cain; and before the judgment of the Flood we read that all flesh had corrupted

his way upon the earth, which was filled with violence, and that every imagination of the thoughts of man's heart was only evil continually.

After the Flood and the awe-inspiring effect which that terrible judgment must have had upon the survivors, we find that within the next 100 years men were defying God by attempting to build a tower which should reach to heaven, with the result that they were scattered over the face of all the earth.

The history of the nation of Israel reveals again and again the same degenerating tendency to depart from the worship of Jehovah to the false gods of the surrounding nations, and the history of the professing Christian Church manifests a similar retrograde movement from the purity and simplicity of New Testament teaching.

As Dr. Zwemer has shown in his excellent paper, students of comparative religion tell us, as the result of their researches, that the earliest forms of religion among the Africans, the Battaks of Sumatra, the ancient Indians, Persians, Egyptians, and Greeks, instead of being crude and degraded as evolutionists would naturally expect, were more or less pure, and that in every case there was degeneracy from monotheism to grosser and lower forms of worship. In Greece, for example, a pure monotheism was in existence long before polytheism appeared.

Thus in profane as well as in sacred history the truth is confirmed of the Apostle's statement in his Epistle to the Romans (i, 21, 23): "That when men knew God, they glorified Him not as God, neither were thankful: but became vain in their imaginations, and their foolish hearts being darkened, they changed the glory of the incorruptible God into an image made like to corruptible man, and to birds, and quadrupeds, and creeping things."

In modern life the same degenerating tendency is also deplorably evident. Children of one family are trained in the nurture and admonition of the Lord, some by God's grace respond; others, drawn away by the allurements of the world, neglect the reading of God's word and the means of grace which He has provided, and although the teaching of their early years is not wholly lost upon them, their children, being frequently brought up without any religious training, become practically modern pagans.

The universe itself has been likened by scientists to a clock that

is running down and, like everything else in nature, reveals not an upward, but a downward tendency, confirming the Apostle's word in the eighth chapter of Romans: "The whole creation groaneth and travaileth in pain, waiting for the manifestation of the sons of God."

Evolution, the doctrine of Satan, whether applied to the inorganic, vegetable, or animal kingdoms, or to the various religions of mankind, remains an unproved and discredited theory and, as one has recently remarked, is only waiting to be consigned to the scientific dustbin.

Dr. J. BARCROFT ANDERSON wrote:—Dr. Zwemer's interesting paper, detailing the various accounts of human efforts to describe the many human organisations that have been in existence in different ages to control the outward relations of their fellow men, with the originator of all things, is of necessity a description of human ignorance and error, evolving, like all other wickedness, from an original partial knowledge of God's revelation to man.

To represent the four letters of the descriptive divine title—a simple Hebrew word, the third person singular, masculine, continuing tense, of the verb "exist"—"He continually exists"—to represent these four letters as being originally pronounced as two syllables would appear to be grotesque folly. The evidence of the earliest transliterations of Hebrew into Greek necessitates the conviction that at that time each Hebrew letter stood for a separate syllable. The present Latin form of that same word—JOVE—may, for aught we know, have been by the Latins once pronounced as four syllables. These pseudo-scientific theologians, in transliterating the four Hebrew letters of the divine title for English readers, instead of using our English letters whose pedigree can be traced back to the Hebrew letters, have used two letters later introduced into human language, "Y" and "W." Why have they done so? What is wrong with the original Hebrew letters as they appear in English to-day—I, E, F, E?

The description by the apostate theologians of the God of Israel as a "simple tribal deity," the invention of the Jewish race, seems to be more ridiculous still. When that people were not entirely apostate, it was God's divine power that alone prevented their apostacy. They never even conquered in war, apart from obvious divine intervention. It was not they who made him their God.

Dr. Zwemer's omission of all reference to Druidism is regretted. Why was it exterminated by the armed might of Imperial Rome? Was it because, as Morgan the historian maintained, Druidism was a purely ethical system, and therefore in Roman eyes not a religion?

Scripture is explicit that THE light, the true, does lighten every man coming into the world. That this light of man, was THE life, life which was in the Creator (Jno. i, 4–5). All history of religion seems to agree with the words in John, this light "in the cosmos (surroundings) was . . . and the cosmos it did not know." I have never yet heard any minister of religion refer in public to God's judgment of men for their attitudes to his eternal power and authority as revealed to them by nature; a judgment which will render eternal life to those who by patient continuance in well-doing seek for glory and honour and immortality. (Rom. i, 20 and ii, 7–9.)

LECTURER'S REPLY.

I am exceedingly grateful to those who sent in discussion of my paper and pleased to find that there is no serious criticism of the premises or conclusions. Once more I wish to express my deep obligation to Dr. Wilhelm Schmidt whose massive work, *Der Ursprung der Gottesidee*, has just been completed by a sixth volume. Those who desire a thorough study of the subject are referred to this work.

The remarks of Dr. J. B. Anderson enter a field not entirely germane to the subject of my paper. The discussion of the name of Jehovah in its original Hebrew form is a question for Hebraists, and as for the Druid religion it is not sufficiently known to offer evidence for or against primitive monotheism. Perhaps I may add that this published paper is part of a chapter in my new book *The Origin of Religion* (Marshall, Morgan & Scott, London).

790TH ORDINARY GENERAL MEETING

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, APRIL 29TH, 1935, AT 5.30 P.M.

MISS A. MILDRED CABLE, F.R.G.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed, and the HON. SECRETARY announced the election of Captain B. Alexander as a Member.

The CHAIRMAN then called on Mr. George H. T. Kimble, M.A., F.R.G.S., to read his paper entitled "The Expanse of the Earth as Known in Old Testament Times."

THE EXPANSE OF THE EARTH AS KNOWN IN OLD TESTAMENT TIMES.

By GEORGE H. T. KIMBLE, M.A., F.R.G.S.

HOWEVER negligible the trade of a community may be, however poor its knowledge of material things, however remote from the main cultural centres, it cannot fail to be aware of, and in greater or lesser measure interested in, the surrounding world. If its people are valley dwellers, following a settled habit of life, they are interested in the behaviour of the river which fertilizes their valley: in the cause of its regimen and in the location of its fountain. After all, asked the Egyptians, why should the Nile overflow its banks every summer, just when the land is languishing under a burning sun? If its people are islanders, they cannot help speculating as to where the sea begins and where it ends and why it is always in motion. Was it, as Homer and many another asked, part of a mighty river that was always flowing back upon itself,* or merely a large pond? As if to encourage such questionings, traders would come to their shores and tell of other lands, beyond their ken,

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* *Odyssey*, XX, 63–5.

inhabited by people of a different skin who worship in temples of unheard of magnificence and traffic in rare merchandise. Many thought these travellers' tales incredible, for who had ever heard of trees guarded by winged serpents ? or lakes infested by bats so large that those who went near to gather perfume had to wrap themselves in ox-hide ? and how could there possibly be men with dogs' heads and others with heads in their chests ?

Whether these tales were true or false, it was impossible to doubt the existence of a wider world when traders produced material evidence of it in the form of new metals and precious stones, spices, and strangely wrought wares.

In ways such as these, the earliest earth knowledge was acquired. It was, of course, a long time before such knowledge was rationalised and made common to the whole community, and longer still before it was mediated to other communities. " Common knowledge," indeed, was very scarce in the ancient world : thus the Egyptian " world " of the IVth Dynasty was the flood-plain of the Lower Nile, some 10–40 miles broad and some 500 miles long, together with the desert fringes. The Sumerian " world " of about the same period (*c.* 3000 B.C.) was the flood-plain of the Euphrates-Tigris system, together with adjacent parts of the Iranian Plateau and the Arabian Desert ; beyond and completely surrounding it was the ocean ! Clearly the two " worlds " had nothing in common.

It would be interesting to trace the expansion of the Egyptian and Sumerian horizons until they coalesced, but we have neither the time nor the data to pursue such an investigation. We know, however, that the expansion dates from a fairly remote time ; desert caravans between Egypt and Babylonia were well established by Abraham's time,* and it is apparent from the first chapters of Genesis that there was a quite considerable knowledge of the earth even earlier. Broadly speaking, this is its scope† :—reaching out in all directions from the cradle of civilization—the Fertile Crescent‡—it embraced, on the north, the Armenian mountains,§ the Anatolian Plateau including possibly

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* *Cf.* Gen. xxxvii, 25, 28.

† Gen. x.

‡ The well-watered lowlands of Mesopotamia, Assyria, and Palestine.

§ The Ashkenaz of Gen. x, 3. See A. H. Sayce : *Races of the Old Testament*, p. 78.

the southern shores of the Black Sea ;* on the east, the mountains of Elam and Media and the Gulf of Oman ;† on the south, the Arabian shores of the Indian Ocean‡ and the Somali coast ;§ on the west, Ethiopia, the Libyan Desert to the west of the Nile and the Ægean Archipelago.‖

But to assign limits to the known world of these early and inadequately recorded times is a formidable task. The information is so slight ; moreover, it is often spurious and hard of interpretation. A country had only to be beyond the horizon to be almost at " the ends of the earth." Directions and distances could not be computed with accuracy and accordingly the the location of a place was frequently the subject of debate. Further, many place-names have disappeared ; many more have become so modified with transliteration that their identification is guesswork : only a few have survived the centuries unimpaired. The problems of interpretation are well exemplified for us in portions of the early Biblical text ; take, for instance, the passage beginning : " And a river went out of Eden to water the garden ; and from thence it was parted, and became into four heads. The name of the first is Pison : that is it which compasseth the whole land of Havilah where there is gold : and the gold of that land is good : there is bdellium and the onyx stone (=malachite). And the name of the second river is Gihon : the same is it that compasseth the whole land of Ethiopia (=Cush). And the name of the third river is Hiddekel (=Tigris) : that is it that goeth toward the east of (=eastward to) Assyria. And the fourth river is Euphrates."¶ These verses are perplexing in more than one way ; firstly, from a hydrographical standpoint. Even if we accept Yahuda's paraphrase of the words " and became into four heads," viz., " and supplied the sources of four rivers," we are not much nearer the answer, for there is no Mesopotamian stream that fulfils all the conditions. The Tigris and Euphrates, both of which are specified, do not have a common

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* The Gomer of Gen. x, 2. *See* A. H. Sayce, *Journal of Biblical Literature,* vol. xliv.

† Joktan and Ophir (Gen. x, 29). *See* below.

‡ Hazarmaveth (Gen. x, 26) = Hadramaut ?

§ The Phut of Gen. x, 6 = " the land of Punt " of the Egyptian Inscriptions ? See J. H. Breasted, *Ancient Records* : vol. ii, p. 248.

‖ Dodanim (=Rodanim) Gen. x, 4 = Isle of Rhodes ? *See* below.

¶ Gen. ii, 10–14.

source, and certainly do not provide the source of a river which "compasseth the whole land of Cush." It may be that the writer believed in a subterranean connection between these rivers and the "river of Eden," a view that was widely held in the Middle Ages regarding the Egyptian Nile and the Nile of the Negroes (=Niger).*

Then there is the problem of the identification of the rivers Gihon and Pison. This I propose to deal with at some length because of its bearing on our subject. Yahuda argues† that they were mentioned because they were, in the author's opinion, the most important rivers of Cush and Havilah, just as the other two, the Tigris and Euphrates, were the most important rivers of Assyria and Babylon; further, that these four rivers were selected because they were "situated at the opposite ends of the world and that in their compass the whole of the then known world would be comprised."‡ If this is so, we have a clue to the location of the Pison and Gihon, for since the Tigris and Euphrates lay well toward the northern and eastern extremities of the habitable earth, it is by no means impossible that they are to be sought in the southern and western extremities. In partial support of this we have the statement that the River Gihon flowed through Cush, which in the Bible, as in other early literature, invariably denotes Nubia or Ethiopia and which during the era of the New Kingdom in Egypt (*i.e.*, about the time of the Hebrew-Egyptian connection) was the "Ultima Thule" of the south. As Yahuda points out,§ the Nile suggests itself for Gihon. This same writer goes on to suggest that because the two Mesopotamian rivers "flow near to one another, framing, so to speak, the eastern (*sic*) part of the world, one may assume that similarly in the choice of the opposite pair of rivers, Pison and Gihon, the idea was dominant that they, too, flowed near to one another and delimited the extreme western (*sic*) part of the world. Pison would thus first have to be looked for in Egypt and its neighbourhood."‖

Whether such an intention were in the mind of the author or not, we cannot tell, but even supposing that it were,

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* *E.g.*, Isidore: *Etymologia*, xiii, 21–7.

† *The Language of the Pentateuch in its Relation to Egyptian*, p. 171.

‡ *The Language of the Pentateuch in its Relation to Egyptian*, p. 171.

§ *Ibid.*, p. 172.

‖ *Ibid.*, p. 172.

there is no justification for the conclusion that Pison must be sought in Egypt: the apposition, as a map will readily show, is not between east and west but rather between north and south, *i.e.*, between Assyria and Arabia rather than between Babylon and Egypt. Moreover, while it may be possible to locate Havilah in Egypt, as Yahuda does, on the ground that the three commodities (gold, bdellium, and malachite) mentioned in Gen. ii, 12 are found there, the tables in the tenth chapter of Genesis, if they have any geographical value, point to a different identification. There Havilah occurs twice: first in verse 7: "And the sons of Cush: Seba and Havilah and Sabtah and Raamah and Sabteca: and the sons of Raamah: Sheeba and Dedan." and again in verse 29: " . . . and Sheba and Ophir and Havilah and Jobab: all these were the sons of Joktan and their dwelling was from Mesha as thou goest toward Sephar, the mountain of the East." With the one possible exception of Cush (although even Cush admits of an Arabian identification*), these names are generally accepted to signify Arabian rather than African localities. Joktan, for instance, is a direct transliteration of the Arabic word Kahtan appearing in the Persian Gulf peninsula of El Kahtan. Sephar is the ancient capital town of Saphar lying probably near the modern Hafa of south Arabia between Ras Risut and Ras Mirbat, surrounded by the Gara mountains.† Raamah is is probably identical with the Regma described by some authors as a gulf in the Persian Gulf.‡ Now is there any evidence that Arabia produced the onyx, malachite, and gold? From very ancient times, central and south-eastern Arabia have been important sources of gold and there were at least ten fields all within easy reach of the north–south and east–west caravan routes.§ Nor is this region waterless: three rivers would satisfy the Genesis description of Pison that it " compasseth the whole land of Havilah," if Havilah is equated with the gold-producing region of the south-east. These are the Wadi-er Rumma, Wadi Dawasir and Wadi Yabrin. It is worthy of note, moreover, that Havilah in Gen. x, 29 is

* A. H. Sayce: *Journal of Biblical Literature*, vol xliv, p. 202.

† W. H. Schoff: *The Periplus of the Erythræan Sea*, p. 140.

‡ D. S. Margoliouth: *Hastings' Dictionary of the Bible.*

§ W. H. Schoff: *The Ship Tyre; A Study in the Commerce of the Bible*, p. 22.

juxtaposed against Ophir which is now widely accepted* as being a locality on or near the Oman coast, a view that tallies with one of the earliest eyewitness accounts of the commerce of that coast: "to Ommana frankincense is brought . . . Exports include dates, gold and slaves. Along the coast there is nothing but bdellium."† Additional support for this view is forthcoming in the Old Testament itself. According to II Chron. iii, 6, the gold that Solomon sent to Ophir for (*vide* II Chron. viii, 18) was "gold of Parvaim" *i.e.*, of Sak el Farwaim, near the Wadi-er Rumma and to the west of Rass. If it is the case, as Schoff opines,‡ that the Ophir voyages were undertaken in order to avoid the unsafe conditions on the caravan routes about the time of Solomon and that they were discontinued as soon as normal conditions in Arabia were resumed, then it is quite possible that the "good gold of Havilah" and the gold of Ophir are one.

Yahuda's case for the identification of Havilah with a region of Upper Egypt must be alluded to because, among other things, it illustrates the extraordinary divergence of opinion among scholars concerning Biblical place-names. Following up his theory that the implied apposition of east and west warrants the identification of Gihon and Pison with various parts of the Nile, he shows§ that the district lying between Assuan and Koptos (=modern Kuft) and the Red Sea was one of the richest sources of Egypt's gold—no fewer than three of the principal Egyptian goldfields, Koptos, Edfu, and Ombos being found there and all of them lying on the Nile. Malachite, he finds, was also produced in the same region‖ and bdellium, an aromatic gum resin, is indigenous to that vicinity. From this he concludes that Pison is "that portion of the Nile which circumscribes the gold land of Upper Egypt."¶ This, in contradistinction to the Nubian Nile, he calls the Egyptian Nile which the Egyptians

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* *E.g.* E. Glaser: *Skizze d. Geschichte u. Geographie Arabiens.* W. H. Schoff: *loc. cit.*, p. 5. W. Carey and E. H. Warmington: *Ancient Explorers.*

† *Periplus of the Erythræan Sea*, §36. (Schoff's edition.)

‡ *The Ship Tyre*, p. 34.

§ *The Language of the Pentateuch in its Relation to Egyptian*, p. 181.

‖ See J. H. Breasted: *Ancient Records*, iii, p. 170.

¶ *The Language of the Pantateuch in its Relation to Egyptian*, p. 183.

of that time conceived to rise at the same spot as the Nubian Nile, that is, at the First Cataract.*

In the absence of philological and other confirmatory lines of evidence, I do not feel that this conclusion is as satisfactory as Schoff's that "the watercourses of north-eastern Arabia (*e.g.*, the Wadi-er Rumma) were probably the chief producing areas of the land of Havilah which could readily supply caravans for Chaldea or Canaan."†

The problem of interpretation is even more acute when we come to consider the tenth chapter of Genesis. Here we have what is essentially a geographical table, although ostensibly it is a genealogical tree. True there are some names that are quite unambiguous: Mizraim, the Hebrew name for Egypt; Canaan—defined as the land stretching from Sidon on the north to Gaza on the south and from the sea coast to the Rift valley of the Jordan (v. 19). Gomer, the Gimirra of the Assyrian texts, the Kimmerians of the Greeks writers; Magog, the country of Gog, the Gugu of Lydia and the Gyges of classical history; Madai, the Manda of the Hittite texts and the Matiene of Herodotus and others; Tubal and Meshech, long since identified with the Tibareni and Moschi peoples, the Tabala and Muska of the Assyrian monuments, who, like the Kimmerians, were to be found on the shores of the Black Sea as well as in the south-east part of Asia Minor.‡ But there are others whose identification is not so certain; for instance, Elishah. This is generally reckoned to be the same place as the Alasiya of the Tel el-Amarna tablets; some see in it a locality of Cyprus, others, including Sayce, the Aleian plain of south-east Cilicia. There is a similar element of doubt about Javan, Kittim and Dodanim. All we can say here is that the first of these is the Hebrew form of the Greek word Ionian and is probably to be identified with Cyprus, that Kittim is also to be associated with the island of Cyprus, possibly with the ancient city of Kition, the site of which is now occupied by Larnaka, and that Dodanim —more correctly Rodanim—is probably Rhodes. But where is Tarshish of the same verse? To look for it in south-east Spain as many have done is to ignore the significance of its

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* *See* Herodotus: *History* ii, 28

† *The Periplus of the Erythræan Sea*, pp. 160–1.

‡ A. H. Sayce: *Journal of Biblical Literature*, vol. xliv, p. 195.

context, which on the balance of evidence I am loath to do. Sayce* identifies it with Tarsus, the Tarzim of the Cuneiform texts. This brings it into the locality of Elishah and so gives point to the grouping in verse 4 "Elishah *and* Tarshish, Kittim and Rodanim." It is commonly objected, however, that later Biblical references invalidate an identification so near to Palestine; firstly, because the references in Isa. lxvi, 19, and Jonah i, 3 are to some place—to quote the words of Max Müller† at "the extreme ends of the earth;" secondly, because the most important mart for "silver, iron, tin and lead" (Ezek. xxvii, 12) was Tartessus in south-east Spain. As to the former objection, I can only state my conviction that the passages in question do not demand any such interpretation. As to the latter, none can deny that Spain was rich in all these metals and that the town of Tharsis, 20 miles north of Huelva (the modern port for the Rio Tinto copper and iron mines) preserves the tradition; at the same time, the products are all quite possible for Asia Minor, if we read zinc for tin,‡ the distinction between them in ancient times being little understood.§ Moreover, in Ezekiel's time the Asiatic Tarsus was coming into prominence as the outlet of the silver mines to the north.‖ The chief obstacle in the way of accepting the Tartessus identification is that "there is no trace of Phœnician trade in the Iberian peninsula for two centuries after the date of Hiram and Solomon."¶

In view of this evidence, I am strongly of opinion that Tarshish is to be identified with the Tarsus of the Levant.

There are many other highly debatable place-names in this same chapter, but we must pass them over.

As a conspectus of early geographical knowledge, the tenth chapter of Genesis is unique. Notices of a similar character are found scattered throughout the Old Testament, but they

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* *Journal of Biblical Literature*, vol. xliv, p. 196.

† Article "Tarshish," *Hastings' Dictionary of the Bible.*

‡ Even allowing that the metal was tin, there appears to be no good reason why it should not have been traded from tribe to tribe overland along the Danube and the Bosphorus just as, at a later date, it came overland along the Rhone valley to Massilia from the British mines.

§ W. H. Schoff: *The Ship Tyre*, p. 80.

‖ A. T. Olmstead: *History of Syria and Palestine*, p. 341.

¶ *Ibid.*, p. 406. *See also* Strabo iii, 2, 11, and Pliny iv, 120.

are confined almost entirely to the realm of Jewish interests and do not enable us to secure a simultaneous world picture. They say nothing about the epoch-making discoveries of the first millennium B.C. such as the voyages of the Phœnicians to the Tin Isles (= the Cassiterides of Herodotus* and others) and along the West African coast, or about Persian and Greek reconnaissances in the Indian Ocean which we know of through the writings of the Greeks and Romans. Such geographical references as there are, are mainly allusive and traditional: new names are introduced occasionally, but it is not until the book of Esther,† that is, the reign of Darius, that India is first mentioned and Greece not until the time of Daniel.‡ Carthage, Italy and Iberia are not so much as named and the limits of the habitable earth remain approximately stationary. When the prophets wish to emphasise the scope of a divine measure, it is in such familar terms as "from Assyria . . . Pathros . . . Cush . . . Hamath and from the isles of the Sea"§ (=Crete and Cyprus?). For them "the uttermost part of the earth" is only the "land beyond the rivers of Ethiopia‖" and the limits of their commercial realm are only Lybia, Persia and Ethiopia.¶

Of course, it is possible to argue that although there is no explicit reference in the Old Testament to the Carthaginian or the Persian or Greek explorations, yet the Jews, at least those of post-Davidic times, must have known something of them because of their position athwart the great trade routes of the ancient world, and that for that reason an examination of the Biblical references to the commodities of their commerce will afford a valuable indication of their knowledge of the earth. If we take this view, we must be careful to remember that no exact equation between the geographical distribution of those commodities and the extent of contemporary knowledge is possible. Take cinnamon, for instance. It is now generally agreed that the true cinnamon of the Egyptians, Hebrews, Greeks, and Romans, both the shoots (= cinnamon proper)

* *History*, iii, 115.
† Esther i, 2.
‡ Dan. viii, 21.
§ Isa. xi, 11.
‖ *Ibid.*, xviii, 1.
¶ Ezek. xxvii, 10; xxxviii, 5.

and the bark (=casia) came from countries as far afield as Burma and Ceylon, and even China.* In transit to the Levant, its source of origin was obscured and it became falsely associated with southern Arabia and Somaliland, whither it came in Indian vessels. Even after direct trade with India was established and the Romans found that at least Arabia was not the true source of cinnamon, the fact that India had traded for many centuries with Somaliland and continued to do so, was strong enough to cause the Romans to believe that cinnamon was a product of Somaliland.†

The point is abundantly illustrated in the famous "Commercial" chapter of Ezekiel, the twenty-seventh. The writer's purpose here manifestly was to portray the commercial supremacy of Tyre and her "world-wide" connections, but it is quite clear that he was unaware of the more outlying of them: thus "bright iron" (=steel)—almost exclusively an Indian product in the pre-Christian era—casia and calamus, also typical products of the Middle East, are known only as wares of Vedan, Jevan and Uzal,‡ towns of southern Arabia.§ "All spices with all precious stones and gold"‖ are associated with Sheba and Raamah, also towns of southern Arabia,¶ whereas only gold and a few spices, *e.g.*, frankincense and myrrh, are native to those localities. The other common varieties came from farther east: spikenard from India (the Hindu Kush foot-hills)**, camphor from Sumatra and Borneo, galbanum from Persia, while aloes came almost solely from the island of Socotra. Precious stones were mined chiefly in Upper Egypt, Persia, India and Ceylon; some varieties came only from those countries.†† Under the heading of the trade of

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* E. H. Warmington: *The Commerce between the Roman Empire and India*, p. 187.

† *Ibid.*, p. 187.

‡ Ezek. xxvii, 19.

§ *See* Glaser: *Skizze d. Geschichte u. Geographie Arabiens*, p. 327 *et seq.* and Schoff: *The Ship Tyre*, p. 84.

‖ Ezek. xxvii, 22.

¶ *See Ante.*

** Jeremiah speaks of "incense from Sheba and sweet-cane (= spikenard ?) *from a far country*," vi, 20.

†† Rubies, for instance, were found in ancient times only in Upper Burma, Afghanistan, Badakshan and Ceylon; Lapis lazuli (= sapphire in the Old Testament) only in China, Tibet, Media and Badakshan; Diamonds (Ezek. xxvii, 13) only in the Golconda mines of India and

Tyre with Tarshish, Ezekiel mentions silver, iron, lead and tin ; now the lead and silver of the ancient world came from Andalusia, and tin, as we have already said, from Galicia and the Cassiterides, but there is no indication anywhere in his writings that Ezekiel knew this. The reference to ivory and ebony in the same chapter would seem to provide still further evidence of the limitation of contemporary knowledge. There these two commodities are associated with Dedan, a locality on the Oman shore of the Persian Gulf.* Arabia, however, is neither the home of the elephant nor of the various species of the Natural Order Ebenaceae from which the ebony hardwood comes. In Ezekiel's day only Ethiopia and India produced these valuable commodities. As there was a well-established maritime trade between the ports of the western coast of India and the Persian Gulf,† even in remote times, it is more than likely that Dedan was one of the ports where Indian vessel met Arab caravan‡ and that the commodities became associated in the mind of Mediterranean peoples with the entrepôt rather than with the place of origin.

It will be obvious by now that if we want to find the real extent of geographical exploration and knowledge in Old Testatment times, we must seek it in extra-Biblical sources. There is no scarcity of material here, but before 500 B.C. the records are

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the peridot (= topaz in the Old Testament) only in the Isle of St. John, in the Red Sea. The emerald, coral and agate (Ezek. xxvii, 16) are all strangers to Syria in connection with whose commerce they are listed. The emerald and agate normally came from the Cleopatra mines in Upper Egypt (the emerald was also a characteristic Indian stone), while the coral was obtained chiefly from the Red Sea, the Persian Gulf and Southern Italy.

* *See* Schoff: *The Periplus of the Erythræan Sea*, p. 153.

† It is instructive to find that the *Periplus of the Erythræan Sea* (§36) speaks of ebony being shipped from Barygaza (= Broach) to Ommana.

‡ The towns enumerated in verse 23 of the same chapter filled similar roles: Canneh (= Cana of the *Periplus*?) and Eden (= Aden?) in respect of the Red Sea traffic, Haran and Chilmad in respect of the Fertile Crescent traffic between India and the Levant. Strategic location was, practically speaking, their only *raison d'être*; "the choice wares, the wrappings in blue and broidered work, the chests of rich apparel" (verse 24) were not of their manufacture: they came from India which in those times held a monopoly of the high quality trade in cloths. It is perhaps not without significance that the first Biblical references to India and cotton occur in the same chapter—the first chapter of Esther.

fragmentary and any reconstruction of the "oikumene" highly conjectural.

From archæological sources it is clear that the Minoans, Mycenaeans and Phœnicians had travelled the Mediterranean from end to end by the close of the first millennium B.C. The Phœnicians may even have discovered its communication with the Atlantic before then, although "the idea that they were sailing to the Tin Isles as early as 1500 B.C. is hardly to be reconciled with what we know of the Mediterranean at that period."* Tradition has it that their oldest colonies in the West, *e.g.*, Utica, Hippo, Leptis Magna, were founded about 1100 B.C.; but there is no archæological evidence for the presence of Phœnicians in the western basin of the Mediterranean before about the middle of the eighth century B.C.† Of their geographical knowledge we know nothing: it was probably very considerable, but as they left no literature, it has been lost beyond recovery.

By 600 B.C. the Greeks had superseded the Phœnicians in eastern Mediterranean waters. Repelled from the Spanish and African coasts by the Carthaginians, they opened up the Black Sea and planted colonies, by degrees, all along its shores. This brought then into touch with the various Scythian tribes concerning whom Herodotus gives such a full account.‡ Northeastward Greek knowledge extended to the Caspian which Herodotus regarded as "a sea by itself, having no connection with any other."§ This opinion, correct though it was, was not universally held in ancient times; later writers like Strabo and Dionysius Periegetes regarded it as an inlet from the northern ocean. Concerning the northern limit of knowledge, Herodotus affirms that the Greeks had penetrated|| beyond Scythia to a people dwelling at the foot of lofty mountains (=Urals ?). Exactly how far their knowledge went it is difficult to tell, but if the description that winter lasts eight months and it is cool for the other four¶ is not simply a traveller's exaggeration then the Greeks probably penetrated beyond the Black Earth steppe region into the forest belt. The Hyperboreans, discussed

* S. A. Cook: *Cambridge Ancient History*, vol. ii, p. 598.
† *Ibid.*, p. 581.
‡ *History*, iv, 1, *et seq.*
§ *Ibid.*, i, 203.
|| *Ibid.*, iv, 25.
¶ *History*, iv, 28.

along with the Scythians, were in Herodotus' view "an imaginary people, the northern counterpart of the blameless Ethiopians of the South."* Other writers were less incredulous. Pindar† believed in their existence and located them near the sources of the Ister (=Danube), Hecataeus‡ in an island "in the ocean in the regions beyond and opposite Celtice" (=France).† No doubt they represent some remote European tribe, although to identify them would be gratuitous folly, for Europe north of the Alps was an almost unknown world until the days of the Roman Empire. Herodotus himself confesses that although he had taken great pains, he had "never been able to get an assurance from an eyewitness that there is any sea on the further side of Europe."§

But the Greeks, lovers of the sun that they were, were more interested in the warm parts of the earth than the cold. India, in particular, held a great fascination for them.‖ In Herodotus' day, India was the most easterly region of the inhabited world.¶ This India was the region about the Upper Indus and its tributaries, the Jhelum, Chenab, Ravi, Beas, Sutlej, better known to us under the name of the Punjaub. It is quite evident from his *History* that Herodotus knew nothing of the great southern peninsula or of the Gangetic plain. The Thar Desert is for him the limit of Eastern knowledge.** He is, however, acquainted with the hillsmen of the North-West frontier—"more warlike than any of the other tribes"††—whither, from their city of Caspatyrus (= Kashmir ?) Darius, King of Persia, sent out Scylax of Caryanda to sail down the Indus to ascertain where it issued into the sea. Scylax not only succeeded in doing this but in sailing across the Arabian Ocean toward the west until he came to Egypt. Some two centuries later (*c.* 330 B.C.), as a result of another military campaign, Western knowledge of India was almost doubled. Alexander's Macedonian soldiers reached the upper Oxus and Jaxartes Rivers, explored the southern shores of the Caspian and the northern shores of the

* *Ibid.*, iii, 17.
† Olympian Odes, iii, 13–16.
‡ See Diodorus II, 47, 1, *et seq.*
§ *History*, iii, 115.
‖ *Ibid.*, iv, 44.
¶ *Ibid.*, iii, 106.
** *Ibid.*, iii, 98.
†† *Ibid.*, iii, 102.

Persian Gulf, crossed the Hindu Kush, explored the Punjaub rivers and sailed down the Indus to its mouth. Nothing, however, was discovered of the vast areas of China and Siberia. Rumour had it that not far north of the Himalayas (which the Greeks seem to have regarded as continuous with the Taurus Mountains)* lay the Northern Ocean joining the Southern Ocean (*i.e.*, the Indian) east of the Ganges. Alexander, addressing his men on the banks of the Hyphasis (= Beas River), assured them that "there remains no great stretch of land before us up to the River Ganges and the Eastern Sea. This sea . . . you will find, joins the Hyrcanian Sea (= Caspian): for the great sea of ocean circles round the entire earth."†

As to the southern extension of the habitable earth, there was considerable controversy in ancient times. It was generally accepted, of course, that the heat of the sun made the tropics uninhabitable. By most writers, the Sahara was regarded as the *ne plus ultra* of the South. The Greeks never crossed it, but they knew of men who had; five Nasamonians went from Tripoli southwards until they came to "extensive marshes [and] to a town past which a great river flowed . . . running from west to east and containing crocodiles"‡ (the Niger ?).

There was only one easy way of exploring the land of Ethiopia and that was to follow the Nile upstream. In Herodotus' day this had been done for a four months' journey by ship and by road§ beyond its course in Egypt, *i.e.*, beyond Elephantine. In this locality "the river flows from the west and the setting of the sun (= Bahr el-Ghazal ?)." But as to the regions beyond this "no one is able to make a clear statement: for all this country is a wilderness under the influence of scorching heat."‖ This, however, was not the last word on the basin of the Nile; under the Ptolemies (*c.* 320–220 B.C.) expeditions, mainly commercial in character, succeeded in revealing the source of the Atbara River, the existence of the Blue Nile and White Nile, and possibly the marshes above the confluence with the Sobat. Aristotle even speaks of the headwaters of the Nile as flowing from "the so-called silver (= snow-covered) mountain"— the

* Arrian: *Indica*, viii, 2.
† *Ibid.*, *Anabasis*, v, 26.
‡ Herodotus: *History*, ii, 32.
§ *Ibid.*, ii, 29.
‖ *Ibid.*, ii, 31.

first adumbration of the physical geography of equatorial Africa.

And what of the maritime exploration of Africa in these times? The oft-told story of the Phœnician "circumnavigation" needs no reiteration here. If it was actually accomplished, it deserves to rank with the voyages of Leif Ericsson, Columbus and Magellan. The evidence for it, though scanty, is plausible, but few, if any, people—certainly not Herodotus, who records the story*—understood the meaning of it, witness such common dicta as "Arabia is the last of the inhabited lands towards the south†" and "[from] Meroe the royal seat of the Ethiopians . . . to the boundary of the torrid zone and of the inhabited earth there are 3,000 stades,"‡ *i.e.*, 375 miles approximately. The west coast of Africa, at any rate, was pretty fully explored down to the latitude of Sierra Leone by Hanno the Carthaginian, though Herodotus was apparently unaware of it; for him the south-west frontier of the known world is constituted by Ethiopia, "the last inhabited land in that direction."§ What country he had in mind is difficult to decide, for as Strabo points out "men used to call every southern land by the Ocean Ethiopia."‖ All Herodotus tells us is that the region produces gold "in great plenty," together with elephants, ebony and tall men¶—a description that applies almost equally well to Senegambia, Sierra Leone and the Gold Coast.**

Of the "extreme tracts of Europe towards the west," Herodotus could not speak with certainty.†† The Cassiterides, that is the British Isles, were in everything but name unknown to him, but they were revealed very soon after his time by Himilco, the Carthaginian explorer,‡‡ and were subsequently visited and written about by Pytheas of Massilia.§§ The island groups

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* *Ibid.*, iv, 42.
† *Ibid.*, iii., 107.
‡ Strabo: *Geography*, 824-5.
§ *History*, iii, 114.
‖ *Geography*, 35.
¶ *History*, iii, 114.
** *See* E. G. R. Taylor: *Scottish Geographical Magazine*, 1926. Article: *Pactolus—River of Gold.*
†† *History*, iii, 115.
‡‡ Avienus: *Ora Maritima*, 80 *et seq.*
§§ Polybius: *Histories*, vol. xxxiv, 5; and Strabo, *Geography*, ii, 4, 1, *et seq.*

out in the open Atlantic, the Canaries, Azores, Madeiras, were very slow in being discovered and small wonder when we remember that views such as the following were current: "One cannot cross from Gadeira (= Cadiz) towards the dark west. Turn again the sails towards the dry land of Europe."* . . . "What lies beyond cannot be trodden by the wise or the unwise."† Avienus tells us why: "there no driving blasts of winds are felt upon the deep, no breath of heaven helps on a vessel: moreover, dark mists shroud the sky as with a cloak: fog at all times hides the swirling waters and clouds last all day long in thickest gloom."‡

This survey, brief as it is, will suffice to show how much better informed on the subject of the earth's expanse Greek literature is than Jewish. Why should this be? The reason, I think, lies partly with the purpose of the sacred writings. After the calling of Abram out of Ur, the course of "world" affairs ceases to be the paramount interest of the chroniclers; henceforth it is the fortunes of the Hebrews, their enemies, their allies, their political and religious experiences that preoccupy their attention.§ But this reason is not entirely satisfactory; it does not explain, for instance, many of the allusions in the commercial chapters of Ezekiel. In my opinion, these and other passages in the Old Testament point to the existence of a conspiracy of silence on the part of the Jews' neighbours, the Phœnicians and Arabians. The Phœnicians, ably succeeded by their colonists the Carthaginians, held for many centuries a monopoly of the western sea-borne trade. To keep it in the face of strong competition from other powers necessitated recourse both to mendacity and secrecy, and with such success, in the case of tin, that long after the Cassiterides had been discovered by the Greeks, the Carthaginians were still able to keep the trade in that commodity in their hands. Strabo tells us that when, on one occasion, "the Romans were closely following a certain ship-captain in order that they too might learn the markets in question, out of jealousy the ship-captain drove his ship out of its course into shoal water:

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* Pindar: *Nemean Odes*, iv, 69–70.

† Pindar: *Olympian Odes*, iii, 45.

‡ *Aratea*, 587–590 (Warmington's translation).

§ Because of this, it is by no means certain that the Old Testament disclosures represent the sum of Jewish geographical knowledge.

and after he had lured the followers into the same ruin, he himself escaped by a piece of wreckage and received from the State the value of the cargo he had lost."* Much the same strategies were employed by the Arabians† in the Indian Ocean, but there is hardly need to elaborate the point any further; moreover, my time has gone.

I have covered only a small part of the field embraced by my advertised title: it has proved too vast and my linguistic and archæological equipment too poor. I have contented myself with outlining the geographical knowledge of the Old Testament Jew and Gentile, and sketching the kind of problem encountered by the investigator in that field. In doing so, perhaps I have tended to overstress the limitations rather than the scope of their knowledge. When, however, it is realised that the men of those days could not estimate distances and directions with precision—the modern terrestrial co-ordinates of parallels and meridians were still future, that, in the absence of confirmatory eyewitness accounts and maps, they were not always able to disentangle the facts from the fables; further, that many reports of explorations were lost to posterity because there were no means of reproduction, that many others of commercial value were suppressed lest the revelation of that knowledge might lead to international rivalry, the surprise ceases to be that so much was unknown but that so much was known. After all, from a purely areal point of view, there was very little difference between the world of Malachi's age and the world of the Middle Ages.

Discussion.

Miss A. Mildred Cable, F.R.G.S., said: We have listened to-night to a learned discourse on the subject of the "Expanse of the Earth as known in Old Testament times." The lecturer has suggested to us that every community is, to some extent, interested in the outer world, the land beyond. "What lies over the hills?" they ask. "Where does the sea begin?" they question. "I am journeying to the Land of the Setting Sun, where God dwells," a

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* *Geography*, iii, 5, 2.

† See E. H. Warmington: *The Commerce between the Roman Empire and India*, p. 188, *et passim*.

Central Asian once said to me. Such expressions are the indications of an instinct in man which convinces him that there are lands beyond his ken.

As the lecturer reminded us, travellers' tales have to be accounted for, as must be the wares which the travellers bring with them. This whole subject is of great interest to Bible students, for not only do we trace the expansion of knowledge by the mention of places and products but the mentality of a nation is strikingly revealed by the degree of importance which its people attach to the exploration of other lands.

Again the lecturer reminded us that a land only needed to be beyond the horizon in order to be referred to as " the ends of the earth." Such an attitude of mind is, I suppose, peculiar to people who are obsessed by a sense of national importance, such a sense being apt to colour every avenue of thought. We have in Central Asia an interesting illustration. The word " Beshbaliq " (Five Fish) is the name of a town near Uch Turfan in Western Turkestan. When a Central Asian wishes to speak of the " uttermost distance," he speaks of going as far as " Beshbaliq." The outer world does not enter his reckoning, though he knows of it and even has dealings with it. He knows of Hindustan and of Russia, but " Beshbaliq " is still to him symbolic of the uttermost parts of the earth.

It is quite possible that the Hebrew people declined in their knowledge of the world after the call of Abram and that his immediate descendants fell far behind their ancestors in world knowledge. They came increasingly to regard themselves as " God's own people," the subjects of a Theocracy, governed by laws, traditions and regulations peculiar to themselves. Outside lay the nations of the world and the lands of the uncircumcised; peopled by those outside the Covenant and on whom the wrath of God would be visited.

The teachers at the palace of a Pharaoh gave Moses instruction in all the wisdom of the Egyptians, but later on, for every Hebrew, Jerusalem became the pivot and the centre. Nothing but the revolutionary teaching of Our Lord availed to waken a sense of responsibility for and interest in what was literally " all the world "—and this in spite of the fact that in the very call of Abram, Jehovah had declared, " I will make of thee a great nation

and in thee shall all the families of the earth be blessed." Yet the families of the earth as such soon ceased to have any interest for them.

We have a parallel in the attitude of China up to modern times. The words "Middle Kingdom" for China proper, "Outside Kingdom" for everyone else. "Within the Mouth" for its own provinces and "Without the Mouth" for its own dependencies, indicate the trend of Chinese thought. A friend of mine was once listening to an old Chinese teacher giving a geography lesson to his boys. He showed them a new map of the world in contrast with the old map where China is given as the central expanse and all round it are grouped smaller states, then he said: "Some people say the world is round and some people say the earth is square: all that dispute means nothing to us; it is quite unimportant." Of course, this point of view arises because China as "Middle Kingdom" cares nothing for the lands outside. Such a viewpoint limits knowledge of the world and maybe the unconcern regarding the outer world in Old Testament times is largely accounted for in this way.

In passing, it is to be noted regarding the rumour that a great sea lay north of the Himalayas, that Dr. Sven Hedin's Expedition has found a great quantity of shells and of fish fossils in the Gobi Desert. I had the opportunity of seeing many specimens of their finds. Tradition persists that a great ocean once covered that desert and I have been shown by the natives a little pond more full of fish than any water I ever saw and was assured that I was looking at the last drop of that vast sea!

The lecturer referred to the source of various goods, such as cinnamon, being obscured through the inevitable change of travel routes. Internal strife has often led to the abandonment of such routes, so that in time even the great Silk Road connecting Peking with Rome became a wilderness while the silk was conveyed by sea, thus giving rise to geographical confusion.

A study of the habits and outlook of the more exclusive nations in modern times, helps us to better understand the viewpoint of the Hebrew people in early days. They were proud, exclusive and indifferent to the history and character of other men. They were not so much ignorant as oblivious of them.

It is instructive to note that knowledge increases as man obeys the Divine law and enters into the Divine intention. If all the families of the earth are to be blessed through one nation, it follows that the nation must get to know about the families of the earth. Exclusiveness is the outcome of national pride.

The Rev. H. C. MORTON, B.A., Ph.D., said that there were just two or three remarks, more perhaps in the nature of questions to the lecturer, that he would like to make. The paper was one that involved much research and few conclusions; but that was the fault perhaps rather of the subject than of the lecturer.

First, with reference to the very interesting suggestion that Gihon and Pison, two of the rivers of the Eden record, are to be placed in South Arabia. Could the lecturer tell us the names and dimensions of any rivers now existing there? I was in Aden last year. Quite a few miles in the interior were vast reservoirs coming from very ancient times, which indicated perhaps a well-watered country; and the Navigation Officer of my vessel told me that a few years previously he had made an expedition some distance into the interior and was there when great storms flooded large portions of the countryside. So even in our day there is sometimes considerable rainfall.

Secondly, can the lecturer give us the dates of the Assyrian tablets which refer to the Gimarru, who, I suppose, beyond question would be the sons of Gomer, or the Kymry. I ask the question because there is, on the Assyrian tablets of about the eighth century, another occurrence of a word wonderfully like Kymry, namely, the Assyrians refer to the House of Omri, King of Israel, and they write it Khumri, there being a faint guttural before the "o" of Omri.

I am specially interested in the knowlege of the Earth in the early times, when, as the lecturer said, the Book of Genesis was written. Genesis x, Mr. Kimble calls geographical; but is not that the old view which is now discarded in favour of the view that Genesis x is a very great ethnological document? My impression is that the far parts of Europe, and in particular I am thinking of the British Isles, were well known many centuries earlier than Mr. Kimble gives us to understand. I suppose, roughly

speaking, one might say the Book of Genesis was written in the sixteenth century B.C.

I think the Kymric traditions represent Britain as occupied by the Kymry about as early as that date. Then there was, according to tradition, a further migration of the Kymry from Troy, and we have on record the remonstrance, addressed by Cassivelaunus to Julius Cæsar when Caesar invaded Britain, in which Cassivelaunus reminded Cæsar that both the Romans and a part of the Britons were descended from the men of Troy.

Literature is late. Apart from the Bible there is very little dependable history of the times of Moses, and apart from the Bible we are dependent for early time mainly upon tradition, later reduced to writing; and I would suggest to the lecturer that British traditions may have a considerable bearing upon the expanse of the Earth as known in the earliest times.

Lieut-Col. W. B. LANE, C.I.E., C.B.E., said: I think that we are too inclined to apply the present-day geographical conditions to the Garden of Eden period, and I suggest that in those days there was a system of freshwater inland lakes like the Caspian Sea; in fact, a chain of them, for we know that Gibraltar was connected with Africa, Sicily, and Italy also. The Ægean Sea with its numerous islands means that Greece was connected with Asia Minor, thus making the Black Sea a lake. I suggest that the Red Sea and Persian Gulf were also lakes and that the four rivers of Eden flowed into the latter separately as we know that the Tigris and Euphrates certainly did. I suggest also that the Hiddekel "that is it which goeth eastward to Assyria" (marginal note) gives us a clue to the orientation of Eden in which case the Euphrates is the north, Gihon the west and Pison the south. (Note that all temples were orientated.)

It will be noticed that the coast of Arabia is mountainous, that there is very little foreshore and that the slope of the whole of the Arabian continent is towards Basrah as a rough centre-point. The three dry watercourses in the southern part mentioned by the lecturer doubtless joined the large dry watercourse extending in a N.E. direction towards Basrah called Wadi Ermak. It is shown on maps. This I consider to be the Pison: "that is it which compasseth the whole land of Havilah where there is gold: And

the gold of that land is good : there is bdellium and the onyx stone." Bdellium is gum frankincense which is, I believe, still exported from Dhufar (? Ophir of Commander Cranford). Onyx is a mixture of quartz and it is in quartz that gold is found and it is the disintegration of quartz that produces the gold in the sands of rivers. This was extracted in ancient times by washing the sand doubtless in the same way as I have seen on the Indus in the Gilgit District of Northern Kashmir. The hills must have been covered with forests and attracted a greater rainfall. The devastation of Arabia is due to two things : (*a*) The Turk and his predecessors who never planted any trees or protected them and (*b*) the goats of the Beduin, and before him those of the patriarchs, which ate off any seedlings and stopped any growth. The Gihon : " the same is it that compasseth the whole land of Ethiopia." This must be the Nile ; but we cannot understand how it can possibly be till we know of the Great Rift extending from the African Lakes through the Red Sea, up through Akaba past Petra, and up the Jordan Valley. The Nile did not always flow into the Mediterranean but turned into the Red Sea near Thebes. The late Canon Tristram in 1864 made a study of the fish of the Sea of Galilee and found some species hitherto unknown. After the discovery of the Victoria Nyanza, species of fish were discovered similar to those only found in the Sea of Galilee. This fact suggested the possibility in a previous age of a chain of freshwater lakes along the line of the Rifts noted in Professor Huxley's map, including the Red Sea and the Dead Sea up to the Sea of Galilee. It is to me extraordinary but very convincing of its truth that the Bible should have contained evidence of the Great Rift which was only described towards the end of the last century. True, is it not, that we should search the Scriptures ?

Sir CHARLES CLOSE, K.B.E., &c., F.R.S., wrote : I am glad to have had the opportunity of reading a proof of Mr. Kimble's very instructive paper on " The Expanse of the Earth as known in Old Testament Times." The paper is packed with information, and I am far from being able to comment upon the quotations from the various authorities mentioned. But it occurs to me that we have a kind of measure of the extreme slowness of the diffusion of culture in ancient times in the long time that it took for the

use of bronze to spread to western Europe, and also the time that it required to spread a knowledge of the use of iron. In Palestine, for instance, the Bronze Age is usually supposed to date from about 3000 B.C., whilst the Bronze Age in England did not begin until about 1800 B.C. Here we have an interval of 1,200 years or so. In the case of the Iron Age this may be said to have commenced in Palestine about 1200 B.C., whereas the use of iron in England must be dated as beginning sometime about the seventh century B.C. Here we have an interval of five or six hundred years. This gives us a kind of guide to the rate of the spread of a culture, and perhaps we might assume that cultures spread in those days at a rate which might be roughly visualised as depending on the inverse square of the distance from the cultural focus. But I don't know that a speculation of this kind is of much value in trying to get some idea of the spread of geographical knowledge in a very distant past.

Colonel SKINNER writes: The association of "All spices with all precious stones and gold" with Sheba and Ramah, also towns of southern Arabia (p. 6, second paragraph), *i.e.*, of the commodities with the entrepôt rather than with their real country of origin, gives rise to an interesting question as to whether the ancient figure of speech, "the ends of the earth," may not have had more definite significance than we now credit it with. Thus, in Matt. xii, 42, and Luke xi, 31 (R.V.) Our Lord's citation of "The Queen of the South" (Queen of Sheba) as "coming" from the ends of the earth, suggests that to the peoples of the near East the south corner of Arabia may have been as Land's End is to us or Finisterre to Spain, *i.e.*, giving the expression a definite geographical signification.

AUTHOR'S REPLY.

I am grateful for the observations and criticisms that my paper has evoked. Lack of space compels me to confine my concluding remarks to points raised by two of the speakers.

Considerable light is thrown upon Dr. Morton's first question, viz., the rivers of Central Arabia, by the writings of C. M. Doughty, St. John Philby,* and A. Musil.† In his *Travels in Arabia*

* *Arabia of the Wahhabis.*

† *Arabia Deserta*, and *Northern Negd.*

Deserta, speaking of the Wadi er Rumma, Doughty says that its length is "forty-five days or camel marches (that were almost a 1,000 miles); it lies through a land-breadth, measured from the heads in the Harrat Kheybar to the outgoing near Basra, of nearly 500 miles. When the Wadi is in flood—that is twice or thrice in a century—the valley flows down as a river." (P. 392, vol. ii.) It receives as many as seventy tributary wadis.

On the question of the "Gimarra" inspections, it is possible to speak with certainty, for the word first appears in connection with some correspondence of a provincial governor of Assyria in the reign of Sargon, about the year 705 B.C.* Thereafter, in the reigns of Sennacherib, Esarhaddon and Ashurbanipal it occurs quite frequently.

The identification of the Kymry—a branch of the Celts—with the Gimarra or sons of Gomer, raises a controversy that I cannot pursue very far here. It is certainly an attractive hypothesis, but I think that Dr. Morton will find that the verbal similarity of the two names is the chief ground of his confidence. The Gimarra (or Gimarru) are universally held to be the Cimmerians of the Odyssey and of Herodotus, whom anthropologists relate to the Thracians—a dark-complexioned, long-skulled people. Tradition has it that the Cimbri of Jutland are of the same stock; even if this is true, which is highly improbable, they have very little in common, racially, with the fair-haired, blue-eyed and long-headed Kymry who were established in Britain *c.* 600 B.C.,† some 500 years before we first hear of the Cimbri. The Trojan tradition, to which Dr. Morton also refers, must likewise be held to be unhistorical in the light of the latest ethnical researches.‡

My reasons for regarding the tenth chapter of Genesis as having geographical as well as ethnological value are based largely upon the reading of the late Professor A. H. Sayce's works§ to which,

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* E. H. Minns, in *The Cambridge Ancient History*, vol. iii, p. 188.

† Not *c.* 1500 B.C. as Dr. Morton suggests.

‡ H. Hubert, *The Rise of the Celts.*

§ *Races of the Old Testament*, and the *Journal of Biblical Literature*, vol. xliv, "The Tenth Chapter of Genesis."

in view of the limitations of space, I would respectfully draw Dr. Morton's attention.

On the question of the knowledge of the British Isles in early times, I am afraid that Dr. Morton has misconstrued the scope of my inquiry; my concern has been entirely with the intra-Biblical evidence of an expanding "oikumene."

With regard to Col. Lane's observations, I should like to say three things.

(1) That there was at one time a chain of fresh water lakes following the line of the Great Rift Valley from Equatorial Africa to the Dead Sea is an undisputed fact of geology; that these lakes did not exist in "the Garden of Eden period" is equally certain as the main lines of the present drainage were established by Oligocene, *i.e.*, pre-glacial times.* Estimates of biological time-periods vary notoriously, but it is generally believed that at least several hundred thousand years elapsed between the close of this period and the first appearance of man.

(2) In the light of our present-day knowledge of the tectonic history of the Rift Valley, I think that Col. Lane would find it difficult to substantiate his theory that the Nile formerly had its outlet in the Persian Gulf. Even though there is some warrant for believing that the Nile did not always flow directly into the Mediterranean, there is none for supposing that it continued its course up the Gulf of Akaba, past the Dead Sea and so to the Mesopotamian lowlands—not even in pre-Oligocene times. Suess, Gregory and Blanckenhorn are unanimous that the Rift comes to an abrupt end in Northern Syria. If the Jordan valley was ever connected with the open sea it was by way of the Gulf of Akaba and the Red Sea and not the Persian Gulf. In view of this I cannot share Col. Lane's optimism that the Bible contains evidence of the geological history of the Rift Valley.

(3) To the Ancients, Ethiopia represented the land south of Egypt (*i.e.*, south of the First Cataract) that was bounded by the Upper Nile on the west and the Red Sea and Arabian Gulf on the east; its southern extremity they did not profess to be able to fix. Now

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* J. W. Gregory, *The Rift Valley and Geology of East Africa*, p. 359 *et seq.*

the Upper Nile is the only river that satisfies the Biblical description that "it compasseth (= goes round) the whole land of Ethiopia." The word "Gihon," moreover, signifies "great leaper"—a very appropriate epithet for the Nubian Nile with its mighty cataracts and tumbling waters. It seems to me, therefore, that Gihon can be equated with the Nile without resort to dubious geological arguments.

791ST ORDINARY GENERAL MEETING

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, MAY 13TH, 1935, AT 5.30 P.M.

ERNEST W. G. MASTERMAN, Esq., M.D., F.R.C.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed, and the HON. SECRETARY announced the election of the Rev. P. Marr Davies, M.A., F.I.C., H.C.F., as an Associate.

The CHAIRMAN then called on Lieut.-Col. F. A. Molony, O.B.E., to read Mr. George B. Michell's paper entitled "The Land of Goshen and the Exodus," as the author of the paper was unable to be present.

THE LAND OF GOSHEN AND THE EXODUS.

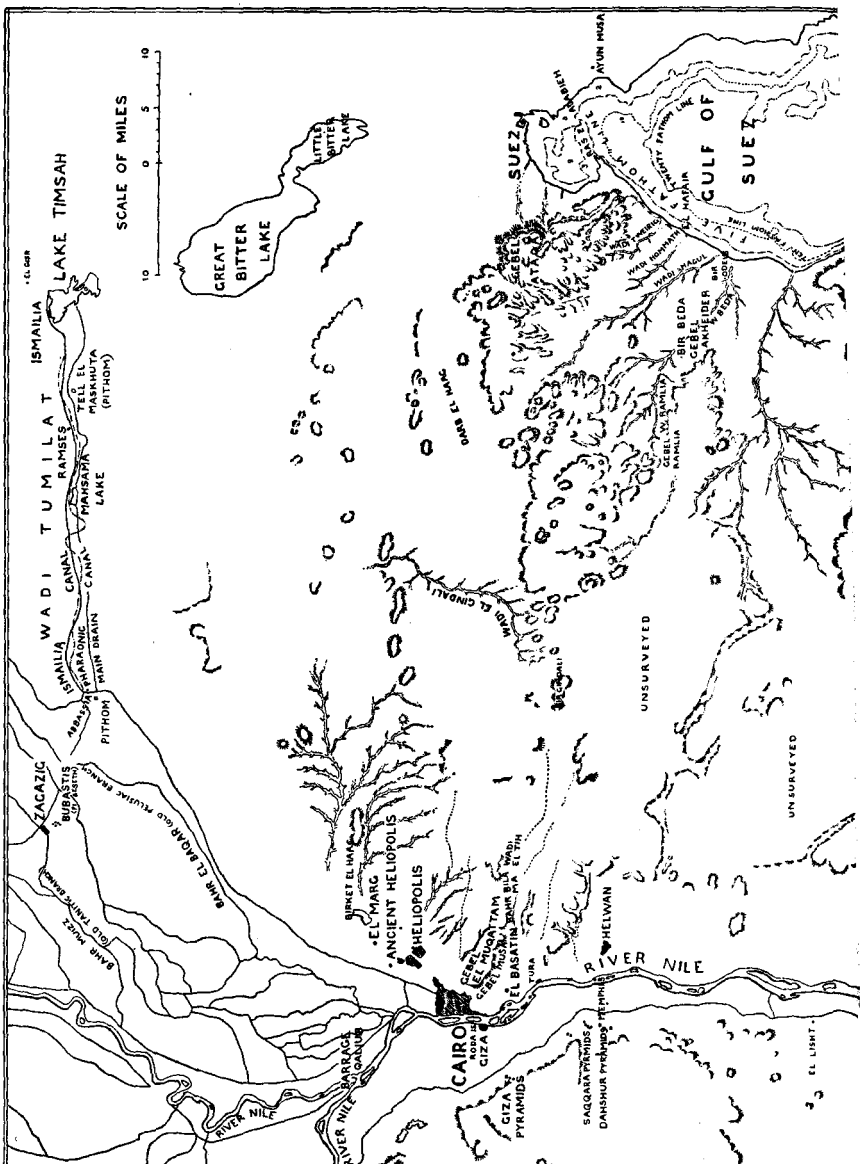
By GEORGE B. MICHELL, O.B.E.

THE accompanying map has been compiled from many sources. It represents the conditions just before the Suez Canal was dug.

The various irrigations of Egypt, some dating from the times of the early dynasties of Pharaohs, have cut up and altered the surface of the Delta so much that it is not always possible now to trace exactly the original water-courses, natural and artificial. Some of the ancient branches of the Nile have been canalized, diverted, silted or stopped up, or have run dry. Still, the general geology of the country has not altered more in historical times than can be accounted for by known causes, and certain features suffice to show the ancient conditions.

Briefly, my purpose is to show (*a*) that the Wadi Tumilat was always a waterless and uninhabitable desert, and (*b*) that the popular identification of the Wadi with the Land of Goshen and the initial part of the route of the Exodus is completely erroneous and unjustifiable.

A glance at the map is sufficient to show that the whole of the country lying east of the Nile Valley and the Delta is


WADI TUMILAT
ISMAILIA CANAL
PHARAONIC MAIN DRAIN
ISMAILIA
LAKE TIMSAH
RAMSES
TEL EL MASKHUTA (PITHOM)
MAHSAMA
LAKE
PITHOM
SCALE OF MILES
10 0 5 10
GREAT BITTER LAKE
LITTLE BITTER LAKE
SUEZ
GULF OF SUEZ
ATAKA
GEBEL ATAKA
WADI MAGUL
GEBEL MARIA
GEBEL ZEIT
GEBEL RAHALIA
BIR BEDA
GEBEL AKHEIDER
DAHR EL MARG
WADI EL GINDALI
UNSURVEYED
ZAGAZIG
BUBASTIS
BAHR EL BAQAR
BAHR MUIZZ
BAHR TANTA BRANCH
BARRAGE OF GANUBIA
RIVER NILE
BIRKET EL HAGG
EL MARG
ANCIENT HELIOPOLIS
HELIOPOLIS
GEBEL MUQATTAM
GEBEL AHMAR
EL BASATIN
DAHR EL AHMAR
WADI HOF
HELWAN
CAIRO
GIZA
GIZA PYRAMIDS
SAQQARA PYRAMIDS
DAHSHUR PYRAMIDS
EL LISHT

a wilderness divided by a horizontal line from Cairo to Suez into two distinct parts. That to the south of this line is broken by high hills and broad valleys, and is known as the Arabian Desert. But it is not a desert in the strict sense of the term. For there is some little rainfall which supplies wells, and causes verdure enough to support herds of camels and their breeders. Indeed, it is the principal breeding ground of that animal in Egypt, and the only part of Egypt where there is any appreciable rainfall.

On the other hand, the country north of the Cairo-Suez line is the typical desert, flat, sandy, waterless, shadeless, and consequently entirely barren.

Through the middle of this uniform desert, and about forty miles north of the Cairo-Suez line, runs the Wadi Tumilat, due east and west, from Abbasa to near Ismailia. The length of the actual Wadi is just thirty-one miles. Its present width varies from one mile in its eastern half to about six miles in its western half.

None of the scanty water from the southern hills reaches the Wadi Tumilat. The wadis marked on the map as running north and then westwards from the hills are invisible except for the sparse desert vegetation that marks the occasional flow of water beneath the surface. And this whole system drains into the Birket el-Hagg, near El Marg, thirty miles south-west from the Wadi Tumilat.

Along the Wadi run: (*a*) the Ismailia Canal, (*b*) the modern drain, and (*c*) the railway from Cairo to Ismailia, and thence to Suez, to Port Said, and to Palestine.

It is in no sense a valley, or nullah, but a shallow and narrow flat space between parallel ranges of low stony hills on the north and on the south, in the general eastern desert that extends all the way to Palestine. Let not the present air of moderate prosperity in the Wadi Tumilat delude the traveller on the railway line into supposing that this is either natural or ancient. It is due entirely to the high-level Ismailia Canal and the constant drainage operations necessary to carry off the harmful salts in the soil, working in co-operation. Without the canal water, the Wadi would be dry. Without the drainage system, the canal water would do more harm than good.

The reason for both these positions is that the desert in question is above the level of the neighbouring branches of the

Nile, even at the height of the annual inundation. The water that now enters the Wadi is led off from the Nile (*a*) by the Ismailia Canal at *Cairo*, well above the Nile Barrage near Qaliub, and (*b*) to a lesser extent, by a cross canal from the Bahr Muizz (the old Tanitic branch), and the Bahr el-Baqar (the old Pelusiac branch), which both take off also from the Nile *above the barrage*. Before the construction of the barrage it was impossible for the waters of these two latter sources to climb upwards to the Wadi.

The cause of the poisoning of the soil with salt is that under the whole of the soil of Egypt lies a bed of salt, left there by the pre-historic sea that once covered it and extended to above Cairo. "At the height of 220 feet—the height of the Mosque of Mehemet Ali at Cairo—there is an old sea beach, which anyone can see for himself, running along the limestone cliff" (Professor Hull, *Vict. Inst. Trans.*, vol. xxviii, p. 278). Fresh canal water, percolating through the porous soil, dissolves this salt, and if sufficiently abundant brings it to the surface. It is *this* salt, not that of the Red Sea, that is found in many places, and that causes the "bitterness" of the Bitter Lakes.

Professor Hull said that the whole of Lower Egypt was covered by the waters of the sea "in very recent geological times." But this "very recent" must have been long before the building of the Pyramids at Giza, of the great temples at Bubastis and Tanis contemporary with the Pyramids (Professor Edouard Naville, *Vict. Inst. Trans.*, vol. xxiii, p. 140), and of the other ancient buildings in the Delta now buried under the Nile mud, that is, before 3200 B.C., at the latest computation. For these were constructed, and still stand, on dry land well above the ancient sea-level.

Now the recession of this ancient sea was undoubtedly caused, principally if not altogether, by the general rising of the land, not necessarily uniformly everywhere or simultaneously in every part. But it must not be forgotten that, both during the existence of the sea, and during its recession, as well as ever since, the River Nile continuously poured its volume of fresh water, laden with mud and bearing its fresh water shells and other organisms, northward to the sea. The mud would be gradually deposited, and the rest carried onwards, spreading fan-wise in the lower reaches. But little or none of this mud would be deposited at an actual right angle to the course of the stream, whereas the light shells might be washed into any

part of the flood. It is thus that I account for the presence of the shells of fresh Nile water animals in the Wadi Tumilat, the Bitter Lakes and other parts of the Isthmus of Suez, though no ancient Nile mud is found there. I say no *ancient* Nile mud, for at a later date canals were dug which would carry more modern mud.

As the land rose wrinkles were formed, through which the Nile flowed, both eroding them and lining them with mud. Thus arose the seven branches of the Nile. Both east and west of the Delta lay the deserts, the dust and sand and gravel of which, blown by the winds, increased the height of the land. The soil brought down from Abyssinia to Egypt raises the level of the bed of the Nile by four inches, some authorities say four and a half inches, in a century. Consequently, the bed of the Nile, and of its ancient branches, is now about eleven feet higher than it was in the days of Seti I (1320–1300 B.C.), the author of the first known canal through the Wadi Tumilat. That is to say, the beds of the branches of the Nile which might supply water to his canal were then eleven feet below their present level. The nearest branch of the Nile was the Pelusiac (now the Bahr el-Baqar), which, at the vicinity of the Wadi Tumilat, flowed due northward, only turning a little north-eastward well beyond the Wadi. It could not, therefore, have supplied water to the Wadi, except through an artificial channel, even assuming that the level of the Wadi was then somewhat lower than it is now. The fact that Seti had to dig a canal is enough to show that there was no natural watercourse in the Wadi. That is to say, during the times of the Ancient and Middle Kingdoms of Egypt, the Hyksos, the Restoration and the XVIIIth Dynasty, and down to the time of Seti I, there was no fresh water flowing in the Wadi Tumilat, nor means of bringing it there.

But if, as it seems to be agreed by geologists, at his time, and, of course, still more so at earlier times, the height of the Isthmus of Suez above the sea was low enough at El Gisr to allow the Red Sea to penetrate so far, it is easy to see that Seti could dig a *sea water* canal along the Wadi Tumilat, which was what he required for navigation purposes, as far as Bubastis, near the modern Zagazig. If this sea-water canal was deep enough to communicate with the Pelusiac and Tanitic branches, no doubt the latter would deliver, at exceptionally high states of the Nile, a certain amount of their fresh water into the canal. This

would account for the deposits of Nile mud in the actual course of the Wadi Tumilat.

But it is out of the question that any Nile water could ever have been used for *irrigation* purposes in the Wadi. It would have been necessary to raise it by shadufs, water-wheels, etc. And it was far too precious and necessary for the cultivable parts of the Delta to be wasted on this uninhabitable desert—not to mention that there is no trace of Nile mud outside the site of the old Pharaonic canal. Interesting particulars may be found in Mr. A. Lucas' "Report on the Soil and Water of the Wadi Tumilat Lands under Reclamation" (Cairo, 1903 ?).

As it is, at a distance of a few yards from the present Canal and drain, dig as deep as you will, you will find *salt*, but no water, unless it be the seepings from the canal and the drain, and that will be brackish. The cultivation of the Wadi is strictly confined, therefore, to the fields on the surface of which the canal water can be distributed by irrigation methods.

Even so, the present taxable area, that is, the area which is sufficiently productive, with all the modern advantages, to produce taxes, is not more than about 112 square miles, or a square of 31 miles long by about $3\frac{1}{2}$ miles wide. This includes the canal, the drain, the railway and the Lake Mahsama. Immediately beyond these limits, both north and south, is dry, sandy and stony desert. Before the construction of the Ismailia Canal, in A.D. 1863, right back to the days of the earliest fresh-water canal, this (? irrigated) belt was considerably less wide.

Yet we are asked to believe that the Sacred Books of the whole Israelitish nation—for the Samaritan text is identical with that of the Jews—in spite of their bitter internal hostility, agreed in accepting the egregious blunder of making this narrow strip in the stony waterless desert "the best of Egypt," and the home, abounding in "fish, cucumbers, melons, leeks, onions and garlic" (Num. xi, 5), for 430 years of a people who increased in that time to some two million souls, with herds of cattle, and flocks of sheep and goats. That is, more than 18,000 human beings alone to the square mile.

Not only so, we are asked to believe that these two millions, with herds and flocks, wagons and all the impedimenta of a great trek, assembled at one time and at one spot at the western end of the Wadi, and marched in a body through this strip, at no place more than six miles wide, a part of which was taken

up by the canal and by a lake, Mahsama. Then they encamped at a spot where the Wadi narrows down to *one* mile wide (less the width of the canal), at "Succoth," which, for the purposes of the theory, is identical with "Thuket," the civil name of "Pithom," which again, according to the only account extant, viz., the Book of Exodus, was a *city* (Exod. i, 11) containing store-houses. The extent of this city we are not told. But it certainly occupied a very awkward position in a constricted space of only a mile wide for the accommodation of so large a party.

The whole story is preposterous. Hardly a soul in Palestine could have been ignorant of the true condition in the Wadi Tumilat, one of the only two highways into Egypt, and in constant use both ways.

This agreement of the two sections of Israel in a blunder so easily exposed is the more inexplicable in that it cannot be attributed to religious or priestly influence. The rival priesthoods and religious systems of the two kingdoms were always, and still are, in bitter antagonism.

The only explanation is that the *history* was true, and the "blunder" did not exist. That is, that the notoriously impossible Wadi Tumilat was not the Land of Rameses, or Goshen, and that the Israelites never did attempt to march through that part of the desert.

Now, on what evidence is the charge made of such a blunder?

One argument, and one alone, is worth discussing. All the rest are totally irrelevant—the position of Zo'an (supposed to be identical with "Tanis") (Ps. lxxviii, 12, 43), and Pi-beseth (Ezek. xxx, 4–18). Neither of these has anything to do with the site of the Land of Goshen.

A single structure has been excavated at Tel el-Maskhuta, in the Wadi Tumilat. In it have been discovered statues of Rameses II, and inscriptions which are said to show that the place was dedicated to "Atum," and consequently was named "Pi-thom." Others show that the civil name of the place was "Thuket," which is asserted to be the Hebrew "Succoth" (Exod. xii, 37). This is held to be irrefutable evidence that (*a*) it was also the "Land of Rameses," that is Goshen; (*b*) both were built by the Israelites under the orders of Rameses II, who was, therefore, "the Pharaoh of the Oppression," and consequently (*c*) the Exodus could not have taken place prior to

the time of that king. Further, (*d*), since Thuket in the Wadi Tumilat was Succoth, the Hebrews must have marched through this Wadi in leaving Egypt.

This argument assumes, against all likelihood, (*a*) the perfect veracity of Rameses II, a notorious robber of other men's credit; (*b*) that there was never a place in all Egypt dedicated to Atum, an aspect of the Sun God which was the ancient national deity of the country, until Rameses II thought of the Wadi Tumilat as an appropriate spot for him; (*c*) that none of the great campaigners of Egypt back and forth into Canaan, not even the Hyksos, cared for their lines of communication, or constructed a blockhouse, or a victualling station, on the high road until Rameses II.

I will not dispute "Pi-thom." But the attempted identification of "Goshen" with "Kesem," and "Phacusa" and of "Thuket" with "Succoth," will not bear investigation.

But even if the solitary edifice at Tel el-Maskhuta was an ancient foundation merely restored by Rameses II, as it seems likely, it does not fit the description of the city built by the Israelites for "the king that knew not Joseph." For the latter is unmistakably a "*city* of places-where-people-or-things-are-*taken-care-of*," (*'arei-misknot*), not a mere solitary structure. The two words are quite distinct. *'Arei* means *cities*. It occurs 1,078 times in the Old Testament, always with that meaning. And the *mi-* in *misknôt* signifies a *place*. There can be no mistake as to what is meant.

Yet there is absolutely nothing, either in the Bible or in the Egyptian monuments, in the Wadi or elsewhere, to connect the Israelites with the edifice at Tell el-Maskhuta. For the name of "Israel," or "Hebrews," is not found in any inscription in the whole of Egypt until the time of Merneptah, the successor of Rameses II, and he recorded it in his stela as that of a people then fixed in *Canaan*.

Nor is the Bible in any way responsible for the confusion that the critics make between the two cities, Pithom and "Ra'amses," and the land of Goshen.

For "the land of Rameses," in Goshen (Gen. xlvii, 11), which the Pharaoh of Joseph's time granted to Jacob and his family to settle in, was manifestly the private demesne of the king (*'erez Ra'meses*, "the land of the son of Ra' "). This was seventy years before the death of Joseph. Now it was *after* the death of

Joseph, under a *new* king that "arose up over Egypt, which knew not Joseph" (Exod. i, 8–11), that the Israelites built a *new* city at Ra'amses. This may, or may not, have been in Goshen; it may, or may not, have been in the same "land of Rameses." Apparently, from the name, it also was in a private demesne of the king, but not necessarily in the same demesne as their home. In any case, there is nothing whatever to show that it was in the same district as Pithom, wherever the latter may have been. On the contrary, it is most unlikely, for this purpose, that these two cities should be planted together in one of the most vulnerable parts of the whole country.

Yet it is only on the assumption that *Ra'meses* also was in the Wadi Tumilat (for which there is not a shadow of an iota of evidence) that the start of the Exodus from *Rameses* (Exod. xii, 37) can be located in the Wadi Tumilat—with all its absurdities.

Finally, wherever the two cities were, the account of their building in the first chapter of Exodus makes it perfectly clear that they were not built under the Pharaoh of Moses' time, but under the new king that arose over Egypt which knew not Joseph, *i.e.*, a new dynasty, and not long after the death of Joseph, at least 300 years before the Exodus. Whether this was, as I believe, the Hyksos, or the XVIIth, or the XVIIIth Dynasty, it was certainly not Rameses II, who was the third king of the XIXth Dynasty and in no sense a "new king that arose up over Egypt."

Now, I would not waste my trouble, or your time, in a merely academic refutation of a ridiculous myth if I had not concrete facts and a satisfactory alternative to offer. This alternative is not a pet theory or discovery of my own. It is the original ancient tradition in Egypt itself. This tradition connects Moses and the Exodus, not with the Wadi Tumilat, a modern invention, but with the Nile about and above the site of Cairo. The ark of bulrushes is said to have drifted ashore on the island of Roda. The cliffs on the southern face of Gebel Moqattam are called Gebel Musa to this day, with 'Ain Musa not far behind them. The oasis of El-Basatin ("the gardens") is still a holy place, and the favourite burial-ground of the Jews of Cairo. The valley that runs eastward from El-Basatin, under the Gebel Musa, bears the significant name of "Wadi et-Tih," "the wadi of the wandering," identical with the name given to the Desert of Sinai, "Badiet et-Tih."

Very briefly, the alternative I offer is as follows :—

Goshen was the valley of the main river Nile, extending from the entrance to the Fayum at Hawaret el-Kesab, including the "Island Nome" and up to Memphis, on the western bank, nearly opposite the modern Helwan. The Pharaoh that promoted Joseph was one of the kings, say, Khu-taui-Ra Ugafa, of the XIIIth (Memphite) Dynasty, *c.* 1909 B.C.–*c.* 1874 B.C.), whose court was at Itht-taui, a fortress a little south of Memphis, close to the modern village of El-Lisht. One of the private demesnes of the king, "Rameses," was on the east side of the Nile, at the modern Basatin. Access to this property was facilitated by the ferries ("El-Me'adi") a little north of the modern Tura. So that communications between "Rameses" and the court at Itht-taui were both short and easy.

From Basatin the route of the Exodus went up the Wadi Bila Ma, and the Wadi et-Tih, to Bir el-Gindali ("Succoth"), a distance of about 25 miles. From Bir el-Gindali, instead of following the Wadi el-Gindali and the Darb el-Hagg, east-north-eastward, the usual route (Exod. xiii, 17, 18), they continued south-eastward another 25 or 30 miles, and encamped at a spot under the Gebel Ramlia range ("Etham, in the edge of the wilderness of the Red Sea," xiii, 20 ; Num. xxxiii, 6). Continuing a short way in this direction they came up against the range of Gebel Akheider, through which there is no pass. They found themselves, therefore, "entangled in the land, the wilderness had shut them in" (Exod. xiv, 3). So they turned back and passed, north and east, through the pass of the Wadi Ramlia, and so to the Bir Beda, a watering-place, and the Wadi Beda.

It must not be supposed that the whole of this journey was accomplished in 72 hours. On the contrary, the people took a whole month to reach "the wilderness of Sin, which is between Elim and Sinai" (Exod. xvi, 1). The "days" are the distances covered by the headquarters of the host. The people had no need to hurry, once they had got away, with the approval of the king, and of the Egyptians (Exod. xii, 31–33), and were ostensibly going only into the Arabian Desert for a religious celebration. As in all their 40 years' wanderings, the headquarters moved from place to place, and the mass of the people followed at their leisure. The whole of this southern wilderness is still fairly well watered, and in former days, when it was well wooded, it was better still.

On hearing that the Israelites had turned back, the king, perceiving that they were no longer headed for the Arabian Desert for their rites, but had turned in a direction which would take them out of Egypt proper altogether, set out to pursue them with his chariots.

Streaming over the Wadi Hagul, the Wadi Hammath, and the Wadi Tweirig, the Israelites arrived at El-Hafair (" the holes ") (" Pi-ha-Hirot," " the mouth of the caverns "), on the sea-shore, between a watch-tower (" Migdol "), or light-house, perhaps at Bir Odeib, and a shrine of Baal-Zephon (" the Baal of the North "), probably the northerly landmark, on a high point in the Gebel Ataqa, for ships coming up the Red Sea (Exod. xiv, 2, 9). There was no escape for the hunted people. For there is no practicable road beyond the Ras el-Adabieh, round the base of Gebel Ataqa between it and the sea. During the night they reached this point, and there they had to stand still and see the salvation of the LORD. And there the LORD performed the miracle for them of rolling back the waters between the 4¼ and the 3¼ fathom lines. And so they passed over on dry land to the Asiatic shore, near the 'Ayun Musa.

To the obstinate materialist this story involves the fatal objection of a definite miracle, in dividing the actual Red Sea. To the believer in GOD it is a confirmation of the Divine Word, that the ALMIGHTY did intervene with His mighty arm to deliver His people in their deadly extremity.

DISCUSSION.

Lieut.-Colonel A. KENNEY-HERBERT said: This paper has been written by one who knows Egypt and knows it well; the nature of the country, the habits of its people, its ancient history and its traditions. It therefore contains much valuable information; but as a commentary on the Bible story of the Exodus I must confess that it is not convincing.

It presents the picture of a Bedouin tribe leisurely moving eastward across the desert, but scattered because of the inadequacy of pasture and of water. A tribe, too, that could lose its way in the short distance between Cairo and Suez.

In contrast, the story we read in Exodus is one stupendous miracle After their departure from Succoth, God directed their movement

in Cloud by day and in Fire by night. They were not entangled in the land, though Pharaoh thought they were. They did not move slowly, for it was told the king that the people fled. Pharaoh had only given permission for *a three days' journey into the wilderness*. On the second day they reached Etham on the edge of the wilderness, the account does not *add of the Red Sea*.

When Pharaoh's pursuit caught them up, it found them encamping by the Red Sea, not streaming through various Wadis like an army in disorder.

I think that it can be shown that that morning was the sabbath, and for that reason the Cloud had not directed that the march was to continue that day. That is why Pharaoh found them by the sea. That is why even God Himself did not move in between the two hosts until sundown, for when He moved, He moved as a Pillar of Fire (Exod. xiv, 19, 20).

I knew the area described some thirty years ago. It is not the country in which anyone in charge of a large body of men, women and children would allow them to wander at their pleasure in any direction. He would keep them well in hand.

If, in all the forty years of wandering, the people followed at their leisure, how was the order of march laid down in Numbers x maintained, how was the daily supply of manna arranged ?

These are a few of the points in which the details of the picture presented to us differ from the details handed down to us by revelation.

There is one point of great value in this paper. It implies that the Red Sea reached as far north as El Gisr, that is practically to Ismailia. I can now understand that the third day's march from Etham to Pi-Hahiroth was not unduly long. I take it that such a mixed multitude could not do more than ten to twelve miles a day.

The Rev. CHARLES W. COOPER, F.G.S., said : I wish to question the correctness of the statement (page 5) that " the name Hebrew is not found in any inscription in the whole of Egypt until the time of Mernepta, the successor of Rameses II."

The correctness of the order of the names and rule of Pharaohs as given in the *British Museum Guide Book* (1930), p. 421, is not,

I believe, disputed. Therefore Amenhetep III and IV (Akenaton) reigned long before Rameses. It was to these two kings that the Tel el Amana letters were written, appealing for help against the "Abiru" invaders, who were the Hebrews.

The Rev. H. TEMPLE WILLS, M.A., B.Sc., said: I want to make one or two comments on this subject. The first is that Israel had to pass a fortified wall when leaving the land—a wall erected to keep out the Bedouin from Canaan. This wall was built along the northern part of Egypt, especially across the regular road to Canaan. Israel could not have left the land without the permission of the Pharaoh who would give instructions for the gates to be opened. Etham was the first station on the road to Canaan which Israel followed at first until God ordered them to turn back. In Exod. xiii, 17, 18, we read God "led them not through the way of the Philistines, although that was near; for God said, lest peradventure the people repent when they see war and they return to Egypt; but God led the people about, through the way of the wilderness of the Red Sea."

The other comment I would make is that we are told in Exod. xv, 22, that Ayun Mousa, the Wells of Moses, was three days' journey from the crossing-place. That would be true if the people crossed the arm of the sea at what are now the Bitter Lakes, but would be quite untrue if the crossing was near Suez.

Lieut-Colonel MOLONY thought that Mr. Michell had brought forward much sound evidence that the land of Goshen was probably along the Nile south of Cairo, but that his arguments that the crossing of the Red Sea took place south of Suez were weaker.

Even if the Israelites started from a point south of Cairo and went via Bir Gindali, they may still have reached the neighbourhood of the Bitter Lakes by the Darb el Haag or a route north of it.

Mr. Michell points out that El Hafair (whose site we know) means "the holes" and Pi-ha-Hirot mentioned in the Bible means "the caverns." This is certainly a striking resemblance, but seems to be the only evidence for the southern route.

The Bible account ascribes the opening of a passage through the Red Sea to wind. The effect of wind on a long stretch of water,

such as Loch Tay, is surprisingly great, and may well have dried a passage through some shallow place near the Bitter Lakes.

Author's Reply.

I regret that the main theme of my paper, the impossible character of the Wadi Tumilat, either as a place of settlement for a pastoral people, or as a route for the Exodus, and the effect of this upon the date of that event, was not discussed.

Lieut-Colonel Molony's suggestion that the Israelites might have turned north-eastwards by the Wadi Gindali and the Darb el-Hagg, and so have reached the Bitter Lakes, is certainly worth attention. It is a Pilgrim Route, and it may have been then a road to the Turquoise Mines in Sinai. But it seems to me unlikely. For they were *not* to go by the way of the land of the Philistines (Exod. xiii, 17), and it would be a very roundabout way to Sinai, and still not avoid the passage of the Red Sea, if that sea reached to the Bitter Lakes. And if it did, the name Yam Suph would not be applicable to that part of the Sea. For "suph" denotes "*flags*," and "*sea-weeds*" (Jonah ii, 5), and neither reeds nor rushes (*i.e.*, papyrus), nor reed-grass. I think it stands for "the sea of the end," or the uttermost sea, that is, from Babylonia, and so the main body of the Red Sea.

My only concern in defending the route *south* of the Jebel Ataka is that it fits closely in every detail with the particulars given in Exodus, whereas the northern route is quite impossible to reconcile with the Bible.

Mr. H. T. Wills ignores my argument that Israel could never have passed by the Wadi Tumilat where his fortified wall was situated. And he assumes, without evidence, that the Ayun Musa are *Marah* (xv. 23).

Now the only indication we have of the direction they took on leaving the Red Sea is in Exod. xv. 22, "they went out into the wilderness of Shur," and this would be *northward*, or north-eastward (*see* Gen. xvi 7 and xxv. 18). Marah was apparently a single well, while "Ayun Musa" is plural. Further, though the waters of Marah were made sweet for the occasion (v.25), this was not necessarily permanent, for the underlying salt would eventually rise to

the surface. Indeed, the name implies that Marah lay in the area of the sand dunes east of the Bitter Lakes. There is a Bir Murr about 8 miles east of Suez, which shows that there is salt beneath these dunes.

I think it is quite likely that Elim was at Nakhl. This name means "Palm Trees." We know nothing of the Israelites' movements during the month that elapsed before their arrival in the wilderness of Sin (xvi. 1), except that they came back to the Red Sea (Num. xxxiii, 10, 11). On the surface it certainly seems an unnecessary detour, but we have to remember that God's purpose was to *prove* them, and humble and chasten them with hunger, etc. (Deut. viii, 2–5).

Rev. C. W. Cooper's objection does not apply to my statement that "the name of 'Israel' or 'Hebrews' is not found in any inscription in the whole of Egypt until the time of Merneptah," for the Tell el Amarna letters were written in *Palestine*, and not in Egypt.

I do not dispute the order of the names and rule of Pharaohs. But I hold that the Exodus and conquest of Canaan took place at least seventy and thirty years respectively before the time of the letters complaining of the activities of the Habiru. Consequently I do not believe in the identification of the Habiru with the Hebrews. Besides, the cuneiform characters are thoroughly reliable for the *vowels*, and there is no possibility of a middle vowel i in the name "'Ibri," *i.e.*, "Hebrew."

With regard to Lieut-Colonel Kenney Herbert's criticisms, (1) I am sorry my term "streaming over the Wadi Hagul," etc., should have given him the impression of "an army in disorder" or "wandering at their pleasure in any direction." On the contrary, they *followed* their leaders, and these, and the 600,000 men "went up by five in a rank out of the land of Egypt" (Exod. xiii, 18) in a perfectly orderly manner. They "went out with an high hand in the sight of all the Egyptians" (Num. xxxiii, 3). When we consider the women, the children, and their attendants following these ranks I think my term "streaming" is very appropriate. (2) The "picture of a Bedouin tribe leisurely moving eastward across the desert, but scattered because of the inadequacy of pasture and of water, or that they had lost their way," is by no means what I meant to convey.

The Israelites were at no time a tribe, or tribes, of Bedouin. They were *settled* Semites, *cattle* breeders and dealers, longing to get to fixed abodes, and utterly impatient of desert life. When I said followed *at their leisure* I was thinking of the herds, and the flocks, and the children that could not be over-driven (*see* Gen. xxxiii, 13). (3) It is true that, in the first instance, the Egyptians " were urgent upon the people, that they might send them out of the land in haste " (Exod. xii, 33). This is what I meant by " once they got away." It was after they had *turned back* (xiv, 2) that it was told Pharaoh that the people fled. Meantime, as they were going on a perfectly approved expedition to worship their god within the Arabian Desert, they had no need to hurry. The Egyptians, we are told, were busy with the burial of their dead (Num. xxxiii, 4), a serious and lengthy process with them. Still less had they need to hurry in the forty years' wandering. Here again the people followed their leaders, along the course of the stream that went with them (I Cor. x, 4), that flowed from the Rock in Horeb (Exod. xvii, 6). As for the manna, each man gathered it for himself where he was (xvi. 16).

(4) It is true that the wilderness *of the Red Sea* is not expressly stated as such in Num. xxxiii, 6. But Exod. xiii, 18 and 20, makes it quite certain that Etham, the second station of the exodus, *was* in the wilderness *of the Red Sea, i.e.*, the *Arabian Desert.*

I can understand, and sympathise with, reluctance to give up a plausible theory. But surely the verbal truth of the Bible comes before all other considerations !

SOME RECENT LITERATURE CONCERNING THE ORIGIN OF MAN.

By A. Rendle Short, M.D., B.S., B.Sc., F.R.C.S.,
Professor of Surgery in the University of Bristol.

THE subject before us is so enormous, and arouses such widespread interest, that it will be necessary at the commencement to define some limits to our inquiry. We shall therefore confine our attention to the question of man's origin from an ape-like ancestor. We shall not attempt to discuss the general theorem of an animal ancestor of nature unknown; if there were any large measure of agreement amongst those scientists who reject the ape-theory what animal is to be postulated instead, it might be profitable to do so; but there is not. Nor shall we have anything to say, except incidentally, concerning the length of time man has been on the earth, nor as to the question as to the original relation between the various races of mankind—white, negro, Mongoloid, American Indian, and the rest.

The orthodox scientific theory of man's origin, taught in nearly every college and university in the world, expounded in the text-books, expected in the examination room, and believed by the majority of the anatomists, zoologists, and anthropologists, was first powerfully argued by Charles Darwin, and popularised by Haeckel and Huxley. It is to the effect that man owes his ancestry to an extinct ape-like ancestor. Some evolutionists considered that he was derived from the existing anthropoid apes—the gorilla, chimpanzee and orang-outang—but this view is given up. Sir Arthur Keith, in his Presidential Address at the British Association in 1927, announced that the question is now definitely settled and the ape-like ancestor theory proved. The common stem giving rise to man and the apes probably diverged in Miocene times, and our immediate ancestors were intermediate in structure between modern man and the ape. No doubt this view is very widely accepted, especially by the older anatomists

and by the writers of orthodox text-books of science; no doubt it is commonly taught in nearly every university in the world. Very many facts and observations seem to confirm it. But science has a way of upsetting our "settled conclusions" just when we are beginning to feel happy and secure about them, and I propose to bring evidence before you this evening, not to establish an alternative theory—apparently the time has not yet come for that to be done—but to show that though Sir Arthur Keith declared that Darwin's theory of the ascent of man would never be shaken, it is being shaken. Mr. Pyecraft (1), one of the zoologists at the Natural History Museum, South Kensington, wrote recently concerning the Theory of Natural Selection generally: "We seem to be threatened with a recrudescence of the controversy over the Darwinian theory. But now the conflict is not to be between learned professors of biology on the one side and the Church and the people on the other, but an internecine warfare—that is to say, between ourselves. It has taken something like fifty years to secure what we might call orthodoxy among the elect; now all is to be thrown into the melting pot again."

The same appears to be true with regard to the ape theory of man's origin. The doubts about it are beginning to percolate down to the newspapers. The *Morning Post* wrote, just about the time when England went off the Gold Standard: "There are disturbing signs that the scientific world may have to go off the ape standard. Speeches at last week's meeting of the British Association suggested that scientists are uncertain whether the stability of physical evolution can be maintained, and now Professor Sergio Sergi, at the World's Anthropological Congress, seems to be depressing the value of the 'missing link.' Owing to the general uneasiness that prevails, it is impossible to give authentic quotations for the evolution theory, but personally I am getting into something else as soon as I can." And in a more serious vein, the *Daily Telegraph*, in a review of a book we shall presently be quoting from, said in December, 1933: "Since the first flush of enthusiasm which followed the enunciation of the Darwinian theory of evolution, the *tempo* of the science of anthropology has suffered a surprising slowing up. This branch of knowledge has advanced from certainty to perplexity." It may be said, "But this is only the opinion of newspaper men." We turn therefore to the scientists.

Let us begin by reviewing the evidence for the ape line of descent. The first and greatest argument, of course, is the very close anatomical similarity between the human body and that of the gorilla or chimpanzee. The likenesses are so numerous and so well known that it would be tedious and unnecessary to enumerate them ; they are so obvious that in the opinion of many nothing more need be said : man and the ape must be brothers. Amongst animals, bodily resemblances have generally been taken to prove blood-relationship. But there is another side to the matter. Although there are striking resemblances, there are also very constant differences. The human brain is far larger and more developed. The ape has a projecting muzzle, a hairy coat, and a foot quite unlike ours ; the great toe is opposable, like a thumb. Man has no vibrissæ (tactile hairs) ; every other mammal has them. The apes have no hymen. No doubt it will be replied that these are merely the differences between species or genera, but a much more considerable point is next to be mentioned. The trend of modern zoological research goes to show that likeness of bodily structure is *no proof of common descent or blood-relationship*. There is a phenomenon amongst animals, living and extinct, known by the name of " Convergence." Two totally unrelated animals, widely different in their geological history and zoological relationships, may have a strangely similar bodily structure or individual organs if their mode of life is similar. And this Convergence is not an occasional and exceptional phenomenon ; examples of it are numerous and widespread. A very full discussion is given by L. Berg (2), of Moscow. How like the common newt, that divides its time between stream and shore, is the crocodile, whose habits in that respect are similar. Yet the crocodile is a reptile and the newt an amphibian. Their zoological relationships are very far apart ; their resemblance is due to the suitability of that particular pattern of legs, tail and general conformation for a life spent betwixt land and water. The spermatozoon of vertebrates, *e.g.*, toad, is, down to minute details, like a free-swimming, lowly form of life called Trichomonas ; but no one imagines that vertebrates are descended from Trichomonas. The extinct (Mesozoic) plants called Bennettitales show a sort of flower, with male and female elements and pollen, but they are Gymnosperms, allied to modern Cycads, and cannot possibly be ancestors of modern flowering plants.

Common wheat exists in several varieties, bearded and

beardless; white, red or black-eared; winter and spring. But just the same varieties are found of other wheats, spelt, rye, and barley. This must be an inherent law of grain; it cannot be chance.

The Dipnoi (air-breathing fish living in mud or water) cannot be the ancestors of frogs, toads, etc., but they share with them the paired lungs, the partitioned auricle (of the heart), and many other characters.

The eyes of the octopus are just like those of a mammal, with cornea, iris, ciliary body, lens and retina; but the octopus is not the ancestor of the vertebrates. Lowly vertebrates have no eyes (amphioxus) or a very elementary eye (the hag fish). Two animals are known that have eyes like an old gentleman's bifocal spectacles, the upper half to see in air and the lower in water, but one is a fish and the other is a beetle.

Three types of fish—the electric eel, Torpedo and Malapterurus—can give powerful electric shocks, but they are quite unrelated. The claws of the lobster and of a scorpion are on the same pattern. The glow-worm and the fire-fly, and also certain deep-sea fish, are luminous in the dark.

One of the most remarkable examples of Convergence is furnished by the marsupials (pouched mammals of primitive type) of Australasia. There are forms that mimic most of the common types of the mammals of Europe, Asia, and Africa. There is a volplaning opossum like a flying squirrel or flying lemur, the flesh-eating Thylacine like a wolf, another marsupial like a rat, and another like a bear. Nor is it only in outward form that Convergence is seen. The crocodile, like the bird, has a four-chambered heart. The extinct flying lizard, the pterosaur, had air-filled bones, and the foramen admitting the air situated just where it is in birds.

Bower points out that both plants and animals are bi-sexual, but it is scarcely credible that they have a bi-sexual common ancestor. Osborn calls attention to the strange parallelism between extinct reptiles and modern mammals; the huge dinosaurs with horns (Triceratops) like a rhinoceros; ichthyosaurus, like a whale; pterosaurs, like a bat; flesh-eating cynodonts with teeth like a dog; iguanodon, walking on its hind legs and tail like a kangaroo; the turtle, armour-plated like an armadillo, or the extinct glyptdon. Surely all this must be law, not chance. Especially when we find that each of these types

requires not one but many coincident modifications—*e.g.*, the heavy-headed rhinoceros must have massive legs and a strong neck; the flesh-eating Thylacine, the wolf and the extinct cynodont must have agility to hunt their prey.

The most recent, and one of the most eminent of writers on the descent of man is Professor Le Gros Clark (3), who, on the whole, is in favour of the theory of descent from an ape ancestor; but he frankly acknowledges the difficulties and pitfalls of the hypothesis. He says: "In the evaluation of genetic affinities anatomical *differences* are more important as negative evidence than anatomical *resemblances* are as positive evidence. It becomes apparent that if this thesis is carried to a logical conclusion, it will necessarily demand a much greater scope for the phenomenon of parallelism or convergence in evolution than has usually been conceded by evolutionists. The fact is that the minute and detailed researches which have been carried out by comparative anatomists in recent years have made it certain that parallelism in evolutionary development has been proceeding on a large scale and is no longer to be regarded as an incidental curiosity which has occurred sporadically in the course of evolution. Indeed, it is hardly possible for those who are not comparative anatomists to realise the fundamental part which this phenomenon has played in the evolutionary process."

We are driven to the conclusion, therefore, that the similarity between man and the ape may be another example of Convergence: in other words, the resemblances do not definitely prove blood-relationship.

But further, as Wood Jones (4), the Professor of Anatomy in the University of Melbourne, has pointed out, there are some anatomical features that make it easier to believe the apes are descended from man—an impossible hypothesis (A. R. S.)—rather than man from an extinct ape. The course of evolution never retraces its steps (Dollo's Law). If a modification has once been made, it persists. Now in some respects man's structure is more primitive than that of the apes. Like early mammals, but unlike the apes, he retains the ethmo-lachrymal, ethmo-sphenoid, and sphenoparietal articulations. The male external genitalia are more like those of primitive primates than those of the ape. Some primitive muscles—*e.g.*, the pyramidalis and the pronator radii teres—are absent in the apes.

According to the law of Recapitulation, every animal has to

climb up its own genealogical tree—that is to say, its ontogeny repeats its phylogeny, or its development in embryo gives evidence of its ancestry. (The law of Recapitulation is the trump-card of the advocates of the evolution theory; as a matter of fact, we think its value is greatly overrated.) Also, throw-backs may occur—that is, pathological specimens will be born from time to time that resemble the ancestor. Judged by either of these tests, the ape-ancestor theory stands definitely discredited. It is true the infant may have a hairy skin (lanugo), but so have nearly all mammals besides the apes. The sloped back forehead, great eyebrow ridges, projecting muzzle, and opposable great toe, are never seen in human fœtus; in fact, the ape fœtus is more like a human being than *vice versa*. The Darwinian tubercle on the human ear, and multiple nipples, which are often quoted as proving man's animal ancestry, are nothing to the point, because no ape has long pointed ears, or multiple nipples. It is often stated that children are born with "tails"; but as a rule the alleged "tails" are nothing but fatty or fibrous tumours such as may be met with in many parts of the body, without any embryological significance. The bones of the coccyx are not useless relics: they have an important function in giving origin to important muscles. In any case, no ape has a tail. There are many congenital abnormalities with which the medical profession is well acquainted: club foot, hare lip, cleft palate, congenital dislocations, nævi, supernumerary fingers and toes, *spina bifida*. But none of these recall the ape. Who has ever seen a human with a projecting muzzle or opposable great toe? We come to the conclusion, then, that the argument from anatomy and development is too uncertain to be relied upon. In the opinion of Professor Wood Jones and others, man's ancestor was not an ape but must be sought much further back, and in a much more primitive mammal. He suggests a little creature called Tarsius, which has been described as a living fossil.

The next main argument for the ape-descent theory is derived from physiology. It is maintained, for instance, that ape's blood and human blood are identical, and differ from that of other mammals; this is taken to prove close relationship.

Far more work has been published on the comparative anatomy of the primates than on their comparative physiology. The best modern summary of the latter known to me is Zucker-

man's (5) *Functional Affinities of Man, Monkeys, and Apes*, published at the end of 1933. He shows that the blood of man and the apes cannot be regarded as identical. The blood of all animals has a good deal in common. The red corpuscles of man and most mammals are exactly alike under the microscope; the hæmoglobin of man and most mammals is indistinguishable by the chemist. As Nuttall showed in 1904, human serum and ape serum give the same precipitin reaction, though for ape's serum a much higher concentration is needed. But there are differences. Human blood contains hetero-agglutinins against the red corpuscles of the ape, and *vice versa*, so that it would be most dangerous to use ape's blood for transfusion in man. Basophile leucocytes, which are very scarce in human blood, are 3 per cent. of gorilla's white cells, 15 per cent. in the orang, and 20 per cent. in the chimpanzee. By the use of anti-erythrocyte sera, Landsteiner and Miller (6), of the Rockefeller Institute, were able to show in 1925 that human and ape red blood corpuscles are not identical, and can be distinguished from one another, but those of a white man and a negro cannot. (This is very fairly pointed out by Sir Arthur Keith himself in his article on the Origin of Man in the last edition of the *Encyclopædia Britannica*.) They go on to conclude: "The experiments described show that a definite and constant serological difference is demonstrable between the bloods of man and the two anthropoids studied, chimpanzee and orang-outang," and again, "This conclusion is in agreement with the accepted view that man has not evolved directly from any of the existing species of primates, as was formerly supposed, but that the Catarrhina, anthropoids, and man have all sprung from a common stock."

Zuckerman further reminds us that man is physiologically different from the apes in his use of fire and tools, in his function of speech, his carnivorous diet and custom of monogamy.

We turn next to the evidence of palæontology. Here we must definitely put out of our minds the wholly imaginary pictures of ape-men that appear from time to time in the illustrated London papers, and even in museums. As Professor Wood Jones says, "The missing link pictures must be deleted from our minds, and I find no occupation less worthy of the science of anthropology than the not unfashionable business of modelling, painting and drawing these nightmare products of imagination, and lending them in the process an utterly false value of apparent

reality." He compares it with the pseudo-science of the old phrenological charts.

Confining ourselves to real evidence, although the whole world has been ransacked in the search for "missing links," the actual discoveries have been few, and have taken unexpected forms.*

When the first skulls of Neanderthal man were found, with huge brow ridges and head sunk on the chest, it seemed as if the true ape-man was before us. But Neanderthal man had nothing else ape-like about him. His brain was as big as ours; his teeth were truly human; he used tools, lit fires, and buried his dead.

So-called Rhodesian man appears to be closely allied to the Neanderthal type, and so does the Galilee skull. On the other hand, the Tauungs skull, called Australopithecus, also first described as a "missing link," is really that of a young anthropoid (Keith). A better case can be made out for three other fossil types, yet all with serious reservations. I append a very brief summary. (The details are taken from the writings of Sir Arthur Keith (7) (8).) First in the field was Pithecanthropus erectus, found in 1894 at Trinil, in Java, by Dubois. These remains consist of the top of a skull, three teeth, and, found at a distance of some 15 yards, a femur. To these is to be added, possibly, a piece of a jaw. The beds in which these were found are considered to be late Pliocene, or more probably early Pleistocene. (Pleistocene means the Ice Age; Pliocene is the geological time-period next earlier.) The skull has been variously described as that of a large extinct ape (by Virchow, Bumuller, Kollman), or intermediate between man and ape (Dubois, Keith, and others).

Next in order is Eoanthropus dawsoni, found by Mr. Charles Dawson at Piltdown, in Sussex, in 1911–12. The geological level, again, may be late Pliocene or early Pleistocene, and again there is a discrepancy between the skull, which has the shape and brain capacity of modern man (Keith) and the jaw found near it, which is ape-like. A piece of worked elephant bone was also discovered close by.

More recently, in 1928–29, a nearly complete fossil skull with several fragmentary jaw bones and teeth has been found near

* The whole subject of the fossil remains of man and apes has been admirably dealt with by Mr. Douglas Dewar in a paper read before the Victoria Institute on March 25th, but for the sake of completeness some of the ground is gone over again.

Peking by Mr. Pei, and described by the late Dr. Davidson Black. These also are dated early Pleistocene. The skull has a brain capacity equal to that of a human, but is shaped rather like Pithecanthropus. The jaws and teeth, also, are intermediate between man and ape, so far as can be determined from the scanty nature of the evidence. The find is called Sinanthropus pekinensis. Worked flints with evidences of fire have been discovered in close association with the remains.

To sum up, there have undoubtedly been some strange types of mankind on the earth in prehistoric times, but that they link man with the ape is open to question. It is clear that Eoanthropus was truly human ; it is possible, but not certain, that the jaw belonged to the same individual. They were not found close together. It is by no means so certain that the femur (human) and the cranium (ape-like) of Pithecanthropus have anything to do with one another. Peking man was truly human. Several " episodes " show how cautiously this palæontological evidence ought to be interpreted. In 1922, Professor Gregory, in America, found a single tooth which he thought was from a man-like ape, and called it Hesperopithecus—" the evening of the apes." The London papers, of course, came out with the usual imaginary drawings—half-ape, half-man. In 1927, it turned out that the tooth belonged to neither ape nor man but to an extinct peccary. In 1926, at Gardar, in Greenland, parts of a human skull and jaw were found, more ape-like in some respects than even the Rhodesian skull. It would have been a beautiful missing link but for the fact that it came from a Norwegian twelfth-century Christian graveyard. According to Professor Hansen, who described it, it is a throwback to primitive man. Sir Arthur Keith, with far greater probability, concluded that it is the result of a disease, acromegaly. But that raises the question whether the other abnormal skulls may not be due to disease also. The real ape-like ancestor of man, therefore, remains to be discovered, if he ever existed. With this agree the candid words of Sir Arthur Keith, written in 1931 : " The fossil forms which represent this stage in the evolution of anthropoid and man have not yet been found ; their existence is inferred."

The most unexpected part of the palæontological evidence, however, remains to be mentioned ; the further back we look for early man, the more like ourselves he appears to be. When skulls with a cranial capacity equal to that of a modern

European, and in all respects undeniable members of the species *Homo sapiens*, were discovered at Galley Hill, at Calaveras, and at Castenedolo, in geological deposits at least as old as those in which *Pithecanthropus erectus* was found, it was felt that the evidence must be lying, and it was more or less discredited. But during the past year or two at Kanam and Kanjera, in East Africa, Dr. L. Leakey (9) has obtained portions of a jaw and skulls of the same great age, early Pleistocene, which are definitely modern in type, and associated with worked flints of human manufacture. These conclusions were verified last year by four committees of experts, anatomists and geologists, sitting simultaneously.* In 1925 a similar find was made in the City of London in digging the foundations for a building. We thus reach the surprising conclusion that *Homo sapiens* is as old as, or older than, any of his alleged ancestors, so far as at present discovered. In other words, the palæontological evidence concerning the forerunners of modern man reduces itself to something not far removed from nil. Reid Moir has found worked flints in East Anglia in earlier beds still, the Pliocene, which present evidences of the work of an intelligent people.

Very briefly, let us have a word with the psychologists. Some of them have been inclined to adopt the attitude that the ape at his best is as good as man at his worst. They emphasise the cleverness of the tricks which a chimpanzee may be taught, profess to be able to recognise ape language, and would have us believe that the Australian aborigine or Central African native has barely the intelligence of a beast. But, as Zuckerman points out, it is very doubtful if, according to exact experiment, the chimpanzee is any more intelligent than a baboon, or, one might add, making due allowance for anatomical differences, a dog or a horse, and, as for the African or Australian native, it is at length being recognised that you must not judge intelligence by that of the adult brought up in the wilds, but rather by that of the child given a proper education. Granted this, the best of the native children will be at least as good as the worst of the European.

Dr. Oliver (10) in September, 1932, tested two large schools in Kenya, the one consisting of native boys and the other of the children of European settlers. He found that the average

* *See* Addendum.

intelligence of the natives was only 85 per cent. that of the Europeans, but 14 per cent. of the natives surpassed the European average. It is noted that the Europeans were of good stock, probably higher than the average at home.

In assessing the relative brain power of Africans and Europeans, it must not be forgotten that the standard of bodily health in the white man is, as a rule, far better, and this is found to have an effect on learning capacity. Dr. J. H. Sequeira (11), in his admirable Chadwick Lecture of April 28th, 1932, drew attention to the astonishing multiplicity of diseases in the individual native, whose person in most instances presents the picture of a pathological museum. Thus in an investigation in one large district 94·8 per cent. of the children under 10 years of age showed symptoms of chronic malarial infection; 75 per cent. of the boys in a reformatory revealed infestation with hook-worm; yaws is almost universal, and is a very disabling disease. It is generally believed that the natives of Australia are as low in the scale of human intelligence as any, but an Australian aborigine was good enough a year or two ago to play in first-class cricket; another is an eminent mathematician. Central African natives can be taught to make microscopic slides and find malarial parasites. To talk about the ape being as intelligent as man is too puerile to be taken seriously.

A curious experiment has lately been carried out by Professor and Mrs. Kellog (12), of Indiana University. They brought up their own child, aged ten months, and a chimpanzee, aged seven and a half months, born in captivity, on exactly the same lines, down to the minutest details. The animal was fed upon a bottle, clothed, bathed, fondled and given exactly the same treatment as the baby. It was put in a perambulator and wheeled about, and in due course taught to walk and to feed itself with a spoon. Its mistakes were corrected, as one corrects the mistakes of a child. But the chimpanzee remained a chimpanzee and the child a child. It was definitely inferior in learning, though it was able to respond to 58 different words and the child to 68. It is put to the animal's credit that, if hungry, it would bite the Professor's trousers. The experiment was brought to an end after nine months—that is to say, just when a child begins to make rapid strides in its education.

It is generally taken for granted that human intelligence shows a progressive development; that modern man is far cleverer

than his neolithic ancestors, and these again than the cave man and the flint-chipper of Chellean (early Palæolithic) times. Of course, our civilization is immensely more complicated. Our machines and our medical skill would be a marvel to the Ancient Britons; but the argument that therefore we have better brains is entirely fallacious. Other men have laboured and we have entered into their labours; other men have invented and observed, and we have learned what they had to teach. Some of the most remarkable of human discoveries were made so long ago that their origin is lost in the mists of antiquity. Who were the prehistoric geniuses who counted the days of the year; discovered the properties of opium; learned how to make cheese and soap; combined copper and tin into bronze; and invented the smelting of iron ore? Who made the first boomerang, or the first bow and arrow, or tamed the first horse? Indeed, we may push the inquiry further back still, and pay tribute to the intelligence of the man who first chipped flints and learned the secret of making fire. As Mr. Reid Moir, the great authority on Palæolithic man in East Anglia, has recently stated, the very earliest worked flints known to us, the pre-Chellean, present such differences that they must have been made by an intelligent and well-cultured people, who had, moreover, a great fight to maintain mastery over the numerous wild beasts that shared the lordship of the world with them. No wonder the earliest known skulls held brains as big as ours.

In this connection we may quote the words of Professor McDougall (13), of Harvard University, a leading authority on psychology: "It is now widely recognized that the strict neo-Darwinian theory of organic evolution is inadequate. . . . It finds itself, at the conclusion of its attempts, with mind upon its hands as an enormous remainder or surd, that cannot intelligibly be brought into the scheme or ignored, save at the cost of the absurdity of the whole scheme."

There will be wide agreement with the scientific correspondent of *The Times* (14) who, commenting on Sir Charles Sherrington's address to the Royal Society in 1925, wrote: "In short, these newer results of science reinforce the dogmatic statements of Western theology, and, it may be added, the common belief of the majority of mankind, that there is a vital difference between men and animals. Our quality of exhibiting reasonable and responsible conduct becomes more distinctive."

Let us conclude with a few quotations from first-class authorities. Professor Le Gros Clark, an advocate of the ape-descent theory, writes, "While, however, we may accept the thesis of Man's descent from 'lower' forms of life, there is by no means a consensus of opinion among biologists as to the precise route by which the human family arrived at its present status, or what may have been the real nature of its immediate progenitor." In his opinion, the common ancestor of man and the apes must have been very far back, and quite a small animal, no larger than a gibbon. It is the different structure of the foot that leads him to this conclusion. He further recognises that no mere play of external forces upon a more primitive organism that reacts to its environment in obedience to what Darwin called Natural Selection is adequate to explain the origin of man. He writes, "It seems certain that the instances of parallelism in the evolution of the Primates which have been brought to light in the preceding chapters are to be interpreted satisfactorily only by the conception of definite pre-determined trends of development, that is, by the conception of Orthogenesis. This conception puts the onus of evolutionary progress more on the germ-plasm, and regards the influence of the environment as of somewhat secondary importance. Hence it seems to intensify the mysteries of the germ-plasm, which (it implies) is endowed from the beginning with countless potentialities for evolution in definite directions. It becomes, therefore, increasingly difficult to conceive of evolution as being fundamentally merely a matter of action and reaction between the physico-chemical factors of the environment and those of a passive or at least a neutral and completely plastic organism. For this reason, Orthogenesis is apt to be dismissed rather abruptly as a 'vitalistic' principle, complicating in an unwelcome manner the mental pictures which biologists have striven to elaborate under the influence of mechanistic ideas. *But if the mysteries of the living and evolving germ-plasm are even deeper and more enigmatical than we have been inclined to believe, it were better to recognise the fact*" (italics ours).

With this accord the words of D'Arcy Thompson (15), the eminent zoologist, in his introduction to Berg's book on *Nomogenesis*: "How species are actually produced remains an unsolved riddle; it is a great mystery. Here at least is a conclusion that few men of our time will venture to dispute."

Professor H. F. Osborn (16), the greatest authority in America

on fossil vertebrates, and head of the Natural History Museum, wrote: "Hence the idea of man's ape ancestry is a myth and a bogey, due to our previous ignorance of the real cause of human evolution." And, again, he writes of "the profound cleft between the ape and the man. It is our recent studies of the behaviourism of the anthropoid apes, as contrasted with the behaviourism of the progenitors of man, which compel us to separate the entire ape stock very widely from the human stock."

Wood Jones comes to the following conclusion: "Man is more primitive than the monkeys and apes. . . . It follows that, far from being a descendant of the apes, he may be looked upon as their ancestor. . . . Indeed, from the point of view of anatomy, I conceive it to be impossible to take any other view."

And Tilney (17), in his monumental work published two or three years ago on *The Brain from Ape to Man*, says "Apes are quite as unconcerned in the origin of man as they are innocent of participation in it."

The special interest of the Victoria Institute is the relation between modern science and Christian faith based on the Bible. The Christian has always felt that the gap between animals and man is bound to be wider than certain scientific authorities would have us suppose. According to the first chapter of Genesis, man was last on the earth of living things; here geology agrees. His creation is separated from that of the animals by the usual formula, "And God said," which always introduces something new. According to the second chapter of Genesis, his body was not created out of nothing, but from the dust of the earth. Man does not eat dust, but it is remarkable that the some thirteen elements of which the human body is made up—carbon, sulphur, phosphorus, hydrogen, oxygen, nitrogen, calcium, magnesium, sodium, potassium, iron, chlorine and iodine—are all found in rock or soil, along with silicon and aluminium, which the body rejects; no elements are present in the body that are not found in rock or soil; those most plentiful in soil are also plentiful in the body, and elements like iodine that are scantily found in the body are scantily found in nature also. It has been customary to interpret the passage in Genesis as meaning that man's body was formed directly from the earth, without any intermediate stages; but perhaps that does not necessarily follow from the Hebrew text. But no explanation of the problem of man's origin that derives him wholly—not only

his body, but also his thinking power, memory, and instinctive reaction to the qualities of right and beauty—from a self-working process of evolution, without any Mind to direct it or moral qualities to give it atmosphere, can possibly be accepted. God said, "Let us make man in our image, after our likeness."

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(13) McDougall. *Evolution in the Light of Modern Knowledge*, 1925, p. 352.
(14) *The Times*, March 16th, 1925.
(15) D'Arcy Thompson, Introduction to Berg's *Nomogenesis.*
(16) Osborn. *The Times*, May 3rd, 1927.
(17) Tilney. *The Brain from Ape to Man.*

ADDENDUM.

Very recently, the site of Leakey's discoveries has been re-examined by another geologist, and the antiquity of his human material seems to be in doubt (Boswell, *Nature*, March 9, 1935; Dreyer, *ibid.*, April 20). The whole incident shows how hazardous some of the confident conclusions of anthropology really are.

DISCUSSION

Mr. DOUGLAS DEWAR, B.A., F.Z.S., said: Professor Rendle Short's most stimulating paper raises so many interesting points that I have to impose upon myself a self-denying ordinance and touch upon only one or two.

In my opinion he has dealt very tenderly with the theory that man evolved from an ape. To my way of thinking the superficial

resemblances between man and the big apes are heavily out-weighed by the deep-seated differences. Professor Rendle Short has touched but lightly on these, presumably because, as he points out, anotomical similarity is no proof of blood relationship. Among these differences between Man and Ape Professor Rendle Short does not mention that which I consider the greatest, viz., the vertical position of man's body, which is unique among mammals, and his bipedal gait, which is also unique, because other mammals, such as the kangaroo, jerboa and tarsier, that progress on their hind limbs, do not walk or run but move in a series of jumps. The upright posture of man renders his anatomy fundamentally different from that of the apes who cannot walk on their hind legs without the aid of their hands or a stick or the support of a human trainer. Not only are man's legs and feet different from those of any other creature, but the whole formation of his hip bone and the curvatures of his spine are unique. These involve muscular peculiarities.

Professor Parsons asserts that there is a greater difference between the musculature of man and that of the other Primates than there is between that of many different Orders.

I maintain that it is just as impossible for a quadruped to evolve into man gradually as it is for one to have become gradually transformed into a whale or bat. There is no kind of gait intermediate between the quadrupedal and bipedal. In my opinion, it is as futile to seek for a fossil skeleton intermediate between that of a human being and that of a quadruped as to hope to find one of a creature midway between a bat or a whale and an ordinary land animal. No anatomist has yet accepted my invitation to make a drawing of the skeleton of such a creature.

I do not think that Vialleton exaggerated when he asserted that man is quite as much isolated from his supposed cousins as bats and whales are from their supposed terrestrial ancestors, and therefore, for anatomical reasons only, man should be deemed to form a separate Order. If we take into consideration his psychic characters he should be placed in a separate kingdom.

Another fundamental peculiarity of man is that he is the only land mammal not provided with a protective covering of hair, fur or wool. For an animal to lose such a covering would not involve the mechanical difficulties attending the transformation of a quad-

ruped into a biped; nevertheless I find it very difficult to believe that any Primate gradually lost its hairy covering, because of the great disadvantages under which a naked skinned animal labours in comparison with one endowed with a hairy covering. Quite apart from the loss of the protection against cold, on the one hand, and from the rays of a tropical sun on the other, and the loss of a valuable protection from the teeth and claws of powerful assailants and the fangs of poisonous snakes, and from skin abrasions during a hasty progress through a dense jungle, quite apart from such disabilities the loss of the hair of a Primate would deprive the female of the ability to retain full use of her limbs for brachiation or other kind of locomotion when carrying her helpless offspring. The young ape or monkey clings to the hair of its mother with leech-like tenacity, to the hair of the back in the case of New World monkeys and that of the under parts in the Old World monkeys and apes. So tight is the grip of the young one on its mother's hair that great force is needed to dislodge the youngster. Le Vaillant records that he shot in British Guiana a monkey carrying a young one on its back. The youngster, which was uninjured, continued to cling to its mother's dead body all the while this was being taken to the camp. In order to tear it away Le Vaillant had to obtain the assistance of a negro. The moment it was disengaged, the youngster made a dart for a wooden block that stood near covered with a peruke, which it embraced with all its paws, nor could it be made to quit this for three weeks.

Considerations such as these show how fantastic is the theory that man evolved from some kind of ape.

As regards Dr. Rendle Short's remarks about Sinanthropus (Pekin "Man") being able to use tools, I am inclined to think that the artifacts found in association with that fossil were manufactured not by that creature but by the men who preyed upon and devoured it. Modern types of men were in existence at that period.

In conclusion, may I make a few remarks about "convergence" of which Dr. Rendle Short has cited many examples. While not denying these likenesses I do not admit that they are the result of convergence. These likenesses are just what we should expect to find if every type is a special creation admirably adapted to its surroundings.

To the evolutionists it is most surprising that such various creatures as peripatus, the centipedes, spiders, scorpions, insects and wood-lice should all breathe by tracheæ of precisely the same construction; hence the theory of convergence has been formulated, *i.e.*, that these complicated organs have evolved independently on several occasions. To such lengths have facts forced this theory that Woodward writes, "Apparently the same family or genus or species may have originated more than once from a separate series of ancestors." In order to account for certain facts the theory has been applied to mankind. Dr. Crookshank believes that man has evolved independently on at least three occasions, the white races and the chimpanzee from one common ancestor, the negro and the gorilla from a second and the mongol and the orang from a third common ancestor. In his book *The Mongol in our Midst*, he adduces a number of facts in support of his view of the origin of man. Klaatsch and Sergi likewise believe in the polyphyletic origin of man.

Finally I propose a hearty vote of thanks to Dr. Rendle Short for his valuable paper.

Mr. W. McAdam Eccles, M.S.Lond., F.R.C.S.Eng., said: I, too, would like to add my meed of praise to Mr. Rendle Short for the paper which he has read this afternoon. But I desire to express my regret that he has taken up so much time in confuting the theory that man has *descended* from "an ape-like ancestor," and for two reasons.

Firstly, man, in whatever way he came into being, has never "descended" but ascended, and secondly, to protest that to argue this point so persistently as being "Scientific" is to impress the mind of the man-in-the-street that he is somehow related to the monkey, a statement often attributed to Charles Darwin but never made by him.

In passing it must be allowed that Darwin did make a mistake when he styled his work "The Descent of Man."

Turning to the last sentences of the address, I can hardly agree that man "occupies a section of the story of Creation *all by himself*" (my italics). Apparently Mr. Rendle Short refers to the first

chapter of Genesis when he writes thus, but if anyone will read that chapter, he will see that man's creation really follows, and is on the same " Day " and linked with the " creation " of " animals, reptiles and wild beasts, God saw all that He had made and very good it was. Evening came and morning came, making the sixth day."

I would ask a very definite question. And it is : Is our physical (animal) body " in the likeness of God " ? If so, then the body of a chimpanzee is " in the likeness of God."

No ; Man possesses that which the animals do not possess and never will possess, a power to correspond with God, to have a Spirit in the likeness and resemblance of the Divine.

Author's Reply.

I should like to thank those who have spoken in such kind terms of my paper, and especially Mr. Douglas Dewar for taking the Chair, and for his very interesting remarks, with which I largely agree.

I have made a few small alterations to meet criticisms from Mr. McAdam Eccles, but I believe the popular idea is correct in attributing to Charles Darwin a theory that man is descended from a Simian ancestor. He says :—

> " As man from a genealogical point of view belongs to the Catarhine or Old World stock, we must conclude, however much the conclusion may revolt our pride, that our early progenitors would have been properly thus designated. But we must not fall into the error of supposing that the early progenitor of the whole Simian stock, including man, was identical with, or even closely resembled, any existing ape or monkey." (*Descent of Man*, New Edition, 1901, p. 239.)

NOTE.

Among the late Dr. Pinches' papers there is a note referring to fresh and convincing evidence as to the sovereignty of Belshazzar, which reads as follows :—

" In a poem of the Persian period, translated by Mr. Sidney Smith of the British Museum, in his *Babylonian Historical Texts* (Methuen & Co., 1924), is a remarkable and by no means friendly account of Nabonidus, King of Babylon, the father of Belshazzar. Mr. Smith shows from this poem that the Tema to which Nabonidus went for at least eight if not for thirteen years of his reign, leaving the executive power at Babylon in the hands of his son, Belshazzar, was not in the neighbourhood of Babylon as has hitherto been supposed, but far away in *Amurru*, " the land of the Amorites," a name given to the West Country, and that it is probably to be identified with the North Arabian Oasis of Teyma referred to in Job vi, 19, and Isa. xxi, 14. The passage which speaks of Tema tells us also of a far more important fact, viz., that Belshazzar was raised by his father to the sovereign power at the time of his departure to Arabia, thus explaining, not only the statement as to his kingship in Dan. v, 1, but also the references to the years of his reign in chaps. vii, 1 and viii, 1. This most interesting passage runs thus :—

' A camp he (Nabonidus) entrusted to his eldest-born (Belshazzar),
An army he caused to go forth with himself ;
He loosed his (Belshazaar's) hands, he entrusted to him the sovereignty,
While he himself set out on a distant expedition.
The forces of Akkad (Babylonia) advanced with him,
Toward the town of Tema in Amurru he set his face,
He set out on a distant march, a road not within reach of Old.'

T. G. P."