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806TH ORDINARY GENERAL MEETING.

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, FEBRUARY 22ND, 1937, AT 4.30 P.M.

W. E. LESLIE, ESQ., IN THE CHAIR.

The Minutes of the previous Meeting were read and confirmed.

The CHAIRMAN then called on Mr. Alan Stuart, M.Sc., F.G.S., to read his paper entitled "Science and the Interpretation of Scripture."

SCIENCE AND THE INTERPRETATION OF SCRIPTURE.

By ALAN STUART, ESQ., M.Sc., F.G.S.

TO those who are both students of science and Christianity to-day, two very significant changes in outlook are taking place. On the one hand, many leaders of scientific thought are declaring that ultimate reality may be mental or spiritual, and on the other, many leaders of the Protestant Churches are finding no conflict between their religious beliefs and the commonly accepted conclusions of science concerning the universe and the origin and nature of man. This *rapprochement* between two parties (both avowedly seekers after truth), whose hobby for centuries has been throwing stones at each other, might at first sight seem to be wholly good. It is to be feared, however, that this amicable relationship has often been attained, at least on the Christian side, by surrendering beliefs which the writer regards as essential corollaries of New Testament Christianity. The doctrine of the Fall of Man due to disobedience of God's command; the consequent necessity for spiritual regeneration by faith in God on the ground of the atoning work of Christ on the Cross, are not now held with the tenacity of former days. This is due largely to the effect of evolutionary doctrines which have permeated into every phase of study and life, and which lead men to believe that it is inevitable that progress to higher and better things in the spiritual, moral and

mental spheres is automatic. These evolutionary doctrines, based upon the work of Darwin and Huxley, became largely materialistic in spirit. It was taught and believed by many that the process of evolution is a continuous one, taking place by means of fixed laws and continuing by means of resident forces. Hence there was no need to believe in a Creator nor was miracle possible. Doubts began to be thrown on the veracity of the Bible and its story of the beginning of things on this earth, and many people came to regard it simply as folk-lore or myth. A doctrine so destructive of their most cherished beliefs has been fiercely and continuously attacked by those who regard the Bible as the Word of God, divinely inspired, and therefore historically accurate and the final authority on God, man, sin and righteousness, and redemption.

It must not be concluded that because scientists say that ultimate reality may be spiritual that science now supports religion. The position is rather that it can now bring no valid argument against religion, since its scope is so much more restricted than either philosophy or religion, and it can know nothing of ultimate causes. Science in general studies natural phenomena, and sets itself to answer the question " How ? ". Philosophy takes within its scope the whole field of human activity and may be defined loosely as man's unaided effort to solve the riddle of the universe. Religion, rightly understood, also touches life at every point. Both religion and philosophy may use the facts and conclusions of science to enable them to answer the question " Why ? ", but the former takes into account the existence of a Creator and the possibility of a revelation from Him to His creatures. Hence the religious man is in a much better position to reach valid conclusions about the scheme of things around him than is either the scientist or the philosopher. It is to be regretted that he has not always made good use of his opportunities, for his views on the world around us have very often been in direct conflict with the views of the astronomer or the geographer. Witness the disagreement between the savants of Salamanca and Columbus as to whether the world was round or not; the anger of the leaders of the Church at the new and " unscriptural " views of Galileo as to the solar system; the burning of Giordano Bruno at the stake for his astronomical beliefs which were not in accordance with the interpretations of the scriptures by the Roman Church. We know now that the

Church was wrong, and had to change its interpretation, which, while it was in accord with the new knowledge of the time, was found not to change any fundamental belief one iota. These facts ought to make Christians very careful not to make dogmatic statements about the world of nature, based on a study of the scriptures alone. This practice has been far too frequent, especially in much of the anti-evolution literature published by and for evangelical Christians. Hugh Miller enunciated a sound principle when he said : " I would . . . without hesitation, cut the philological knot, by determining that the philology cannot be sound which would commit the Scriptures to a science that cannot be true " (p. 123*). In modifying a widely held interpretation of Scripture to be more in accord with new knowledge, we must, of course, be sure that the new knowledge is worthy of acceptance, that it has been well tested and is verifiable. Some evangelical Christians are very sceptical about the findings of science and the honesty of scientists (especially biologists and geologists !). It may be well to give a brief account of its methods and scope.

Scientific method essentially consists of (1) technical experimental means by which phenomena are observed and studied and (2) logical and mathematical treatment of the results of observation and experiment in order to discover the relations of the phenomena studied. Science can, in general, use only abstractions of the things it studies. In the science of physics, for example, such properties as weight, density, size, velocity, acceleration, etc., are studied. Now these are parts and not wholes. The world we live in is smelly and noisy, but the world of physics is none of these things.†

Science progresses by the study of phenomena, the relations of which are first tentatively stated by means of a hypothesis as a starting point for further study. The scientist's imagination must play a part at this stage. Hypotheses are tested by further observation and experiment, which will either lend support or not to the first ideas on the relations of the phenomena. An hypothesis (or a theory built up of verified hypotheses) which is found to withstand any test which can be applied to it comes to

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* Hugh Miller, *The Testimony of the Rocks.* The Two Records, Mosaic and Geological. Edinburgh, 1884

† C. E. M. Joad, *Guide to Modern Thought.* London, 1933, ch. iv.

be regarded as a natural law by means of which " the invariable sequence between specified conditions and specified phenomena " can be stated. Hence, in spite of the fact that science can deal only with parts and not wholes, it can discover and relate certain things which are true in our experience and which are constantly found to be reliable bases for further research.

Remembering these things, then, that science cannot tell the whole truth, and that it cannot investigate ultimate causes, we will not fall into the error, on the one hand, of enthroning science instead of God, nor will we, on the other, cavil with the scientist because he has not discovered God nor made creation the starting point in his investigations. For instance, the following quotation is typical of many : " Yet how can science expect to reach correct conclusions if it does not accept as its starting point the great foundational truth that God is the Creator ? " (p. 79*). A scientist who goes back causatively as far as he can, and then falls back upon the idea of creation as the ultimate cause, enters the realm of philosophy and leaves that of science. The truth of creation came to scientist and non-scientist alike by revelation.

And now let us turn to the Bible and ask how we are to regard its utterances in the light of science. If we take note of the references in Scripture to natural things, we find that they can be classified into three well-marked groups. In the first class come references of a literary character like that of Hab. iii, 6, " the everlasting mountains were scattered " ; or of Gen. xlix, 26, " the utmost bound of the everlasting hills." The geologist knows that hills and mountains are transitory, but the idea is simply to express great length of time in relation to human life. Such rhetorical and illustrative references, to be understood by those to whom they were addressed, must conform to the ideas of the time in which they were written. The second group comprises what are commonly called miracles. All that need be said about these here is that in our own experience a new cause produces a new effect, without changing any of the laws of nature. Our heavier-than-air flying machines do not violate any known laws of nature, yet their flights would have been regarded as miraculous by the ancients. We must not forget that to explain a miraculous happening by means of some immediate natural cause does not necessarily get rid of the miraculous element.

* W. Bell Dawson, *The Bible Confirmed by Science.* n.d., London.

For example, to say that the town of Jericho stands in a very unstable district in which earthquakes are frequent, and that it must have been an earthquake that caused the walls to fall down flat, does not eliminate the miraculous coincidence of the trumpet blast and the collapse of the walls, of which, by the way, one part remained standing! A true appreciation of miracles necessitates a view of both the physical and spiritual realms.

The third group of statements is such that they can be classed only as direct revelations, for they do not conform to the scientific knowledge of their day, nor to that of long afterwards. One such, to which our attention is shortly to be directed, is the account of the creation found in the first chapter of Genesis, and others have often been noted, for example, in the Book of Job. Now although statements of the last class are very interesting and, indeed, important, in that they form some part of the evidence for the inspiration of the Holy Scriptures, yet it is the spiritual message that is of paramount importance in the Bible, and it is the inner spiritual meaning and truth that takes precedence over mere narrative. The great truth in the first chapter of Genesis is that God is the Creator, and the details of how and when He did the work are of secondary importance; the great truth in the story of the Noachic deluge is that God hates sin and must judge it; whether the waters actually overflowed every square foot of this earth is of secondary importance.

My excuse for discussing in this paper certain of these matters which I have classified as of secondary importance is that I believe that the present state of the controversy between the representatives of conservative biblical thought and the evolutionist camp warrants it.

In a discussion on this subject, certain other things must be borne in mind. Finality has not been reached in science, and a too ready desire to reconcile Scripture with any new scientific statement which seems to confirm an interpretation may lead later to an undignified retreat. It is surely significant that men have always been able to find texts which can be interpreted to fit the science of their time, and in each age Scripture has been quoted in support of erroneous views. This can only be done when quotations are taken from their contexts (whether Biblical or scientific) and the words of Scripture given meanings which their use in the Bible does not warrant. It behoves us, therefore, to eschew too dogmatic an utterance on matters which are

reasonably arguable or not finally proved, and to remember humbly that, just as science has not yet reached finality, we also, as Christians, only see as through a glass darkly. Our interpretations of some scriptures may have to be modified in the light of future knowledge. This will never affect the truth of God's eternal Word.

It is only natural that new knowledge which makes us reconsider our interpretation of a scripture should be received with caution. A strong body of conservative opinion is a necessity in human affairs, and nowhere more so than in religious matters. This conservatism acts like a damper on the swinging needle of a seismograph, and by its restraining influence ensures that change shall be gradual, time being allowed for the community to adjust itself to the new conditions. These preliminary matters having been dealt with, I will turn to the main subject with which I wish to deal, and that is the relation of the sciences which have contributed most to the doctrine of evolution, to the Scriptures.

I do not think that there will be any controversy about the amount of harm that the doctrine of *materialistic* evolution has produced in the realms of morals, religion, politics, economics, and indeed in every phase of human life. It is not the purpose of this paper to expound what has been done elsewhere much better than could be done here. It is a good thing that there are those who have spent time and talents to combat this evil. But when one surveys the anti-evolutionist literature as a whole, with the exception of a few outstanding examples, one is immediately struck by several facts. These are, that the basic facts of geology and biology, upon which the theory of evolution has been based, are very rarely presented at all or, if presented, are shown in an unfair light. It too commonly appears that a jibe and an exclamation mark are regarded as substitutes for cogent argument. A very common method of attack is to conclude that because scientists differ widely on the exact age of the earth, or the causes of evolution, that therefore there are no facts worthy of consideration, and that the theory of evolution is a figment of the imagination. It is forgotten that the same mode of argument can be used by the non-Christian, who, looking upon Christendom and its multitude of sects and differing views, comes to the conclusion that there is nothing in Christianity. The Christian knows that this conclusion is not justified, and should therefore

be willing to allow that such arguments used against the scientist are also invalid.

In any discussion on the subject of science and Scripture, the following points should be noted:

(1) The scientific knowledge must consist of verifiable facts or laws, accepted by the majority of people qualified in the relevant subject.

(2) The Scripture under discussion must be studied primarily to get the meaning it bore at the time of writing, *i.e.*, the words of the original bear the meaning they had when they were penned. This does not mean that they may not have an added meaning now in the light of later happenings.

(3) The meaning to be given to any word must be decided in the light of the use of the word by the Holy Spirit in Scripture.

Certain words which will appear in the following part of this paper will here be defined. For the idea of an evolutionary process initiated and carried on simply by so-called natural forces, governed wholly by chemical and physical laws, and for which is denied the necessity for any creative agency or acts, *i.e.*, denies that God created the heavens and the earth, the term *materialistic evolution* will be used. For the idea of a process which simply implies the production of the many forms of life from one or many older forms of life, by gradual and/or saltatory changes during descent by whatever means, the term *evolution* will be used. The term *special creation* implies that every present-day species was separately created and has remained essentially unaltered since it came into being. Whenever the word *creation* is used, it means the power of God exerted to bring into being some form of life (*i.e.*, a species), *not necessarily* instantaneously. An *orthodox Christian* is one who accepts the "categorical imperatives of the Christian faith."

The subject will be dealt with in the following order:

(1) A statement of the relevant facts of geology.

(2) A discussion of their interpretation.

(3) The relation of the above to Genesis i.

(4) Summary and conclusions.

It is necessary to make a brief statement of the relevant facts because attempts have been made recently to deny the fundamental bases of geological science.* It must be stated here categorically that the geological arguments used in these books are quite unsound, and are based upon either a wilful misrepresentation of the facts or a woeful ignorance of them, and this in the name of the truth of Christianity. Such attempts gain scant notice from geologists, but amongst non-scientific Christians and sincere inquirers much harm is done by arguing untruthfully for the truth (Job xiii, 7).

As to the origin of the earth, the geologist has little to say. This is the field of astronomy ; but all theories agree that however the material aggregated a stage must have been passed through when the earth was blanketed from solar radiation by planetesimal dust or the clouds of the primitive atmosphere.†

The science of seismology has provided evidence as to the inner constitution of the earth,‡ and shows that the crust of the earth is very irregular, being probably 40 to 50 miles thick under the high mountain ranges but very much thinner under the oceans. The crust is not an homogeneous layer, or a series of regular layers extending round the earth, but is composed of different kinds of rock from place to place, piled upon and against one another.

Three main classes of rocks occur, namely, *igneous rocks* which have been formed from a molten magma by cooling and crystallisation ; *sedimentary rocks* which have been formed from the detrital debris of older rocks undergoing denudation ; and *metamorphic rocks* which have been formed from the other two groups by means of heat or stress. It is with sedimentary rocks we must primarily deal, for it is in them that the organic fossil remains of former living creatures are preserved.

The relative ages of various strata are established by the *law of superposition,* younger beds being laid down upon older ones. Except in places where compressive earth movements resulting from mountain building activities have altered the relative sequence

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* G. McCready Price, *Q.E.D.* (New York, 1917) and *The New Geology.*

† H. F. Osborn, *The Origin and Evolution of Life.* 1925, p. 43.

‡ R. A. Daly, *Igneous Rocks and the Depths of the Earth* New York 1933.

of the rocks by thrusting and over-folding, *this law is axiomatic.* Some thrusts are nearly horizontal and simulate bedding, but the true character of the junction is readily recognised on close inspection.

Knowledge of the relative ages of fossils depends upon the same principle, that is the younger lie above the older. It is also a well-established fact that in every part of the world where the succession has been examined there is agreement as to the general sequence of fossil forms. It used to be thought that migration of faunas would lead to wholesale reversals of the order of fossils in different areas, but this has been found to be a rare exception and not the rule. When such reversals happen, neither the general aspect of the faunas nor the broad sequence is affected. A comparison of the diagrams of fossils from the Cambrian or Carboniferous rocks of Europe and America would convey the truth of this generalisation to the non-specialist, and it applies generally to every period. (The special case of the Australian continent will be referred to later.) The "*principle of faunal dissimilarity* which postulates that the fossils found in the several rock formations are peculiar to those strata," is another important principle of geology. It is therefore possible to trace the history of life on the earth as it is revealed in the rocks now exposed. The fossil record is not complete, because animal remains need special conditions for preservation to take place, and land animals and plants have a much smaller chance of being preserved than have those which live in water. Usually only the hard parts of animals are preserved, but often the internal structure of a fossil is perfectly preserved by having been chemically replaced molecule by molecule. These can be studied as easily as modern species by making rock sections through the animal at small intervals.

The maximum thickness of the sedimentary rock cover has been estimated to exceed 60 miles, and is probably up to 80 miles thick. This is the amount of material which has been laid down first of all horizontally. To get the above result, the maximum thicknesses of succeeding formations are added together,* from Cambrian times onwards. This thickness of sediments must have taken immense ages to build up. It is significant that the more the question is studied greater and greater time is

* *The Physics of the Earth,* IV. *The Age of the Earth.* Nat. Res. Council, Washington, 1931, p. 18.

found to be necessary, and the concensus of opinion now is that 100,000,000 years is a very conservative estimate from the beginning of Cambrian times until the present, and the conclusion is forced upon one " that the records of the rocks fully justify us in claiming for the earth an antiquity so vast as to be far beyond the power of the human intellect to grasp."

Methods based upon the ratios of lead isotopes produced from uranium and thorium give much greater ages than those which have been deduced from the rate of accumulation of sediments. Sir Ambrose Fleming, in a recent paper to this Institute, threw doubt upon the accuracy of these methods by showing that many isotopes of lead may be present in minerals, and that the result may be invalidated owing to difficulties in determining their proportions and mode of origin. These difficulties are realised to the full by those engaged in the work. The following quotation sums up the situation. " In attempting to build up a time scale it is clear that we have to steer a difficult course through a maze of data of very variable quality, guided in some places by atomic weight evidence, in others by series of accordant ratios, but in far too many by a subjective weighing of probabilities. Nevertheless, although only a few points can be fixed with precision into the geological column, and the total assemblage of data is too confused to permit detailed accuracy, it is remarkable how consistently the most probable ratio for each of the various suites falls into its proper place and order as judged by geological age. That this is so must be considered the final proof that the ratios selected are at least of the right order, and that no serious error is anywhere involved."* The date for the latest Cambrian of Sweden, one of the best results obtained so far, is given as 450,000,000 years.

The earliest well-developed faunas appear in the Cambrian system where every invertebrate family is represented. In the Pre-Cambrian, certain evidences of former life have been found. Beds of limestone and layers of graphite, together with phosphatic nodules, are the lithological evidences. Very ancient plants may be represented by graphitic capsules from the Pre-Cambrian of Finland, an ancient crustacean by *Beltini danai* from the shales of Montana, and in addition worm tubes, algæ and sponges are listed from different localities.

* *The Physics of the Earth*, IV. *The Age of the Earth.* Nat. Res. Council, Washington, 1931, p. 435.

Following the invertebrates of the Cambrian, come in turn the first vertebrates (fish), amphibians, reptiles, birds, mammals, and lastly man. The successive appearance of higher forms of life is one of the fundamental facts of geology, and forms an important part of the evidence upon which the theory of evolution has been built. Now the theory of evolution depends for its support not only upon the belief in the continuity of the life stream but upon the ordered sequence of life forms, and the anti-evolutionist has endeavoured to throw doubt upon the truth of both these concepts. While it is true that many of the groups of animals became extinct, and were apparently replaced by entirely new groups in the same locality, yet other forms come down almost unaltered from very ancient times. For example, the genus *Lingula* has a range from Ordovician to Recent, and the genus *Nautilus* extends from the Trias to the present day. It must be remembered that some of the gaps which now occur in the sequence may be bridged in the future, as a very small area of the world has been examined in any detail as yet. Work in Mongolia has recently brought to light many curious and strange types of mammals. Further, in certain groups of rocks series of fossils occur which show such small progressive changes as they are traced vertically from horizon to horizon that it is difficult to believe that the later forms are not the descendants of the earlier ones. Examples, such as the minute changes in the Cretaceous echinoid *Micraster*, the various Jurassic ammonites and the *Ostrea-Gryphæa* sequence of shells in the Lower Lias, can be cited. The existence of these more gradual sequences is another fact which has been used to uphold the theory of evolution. A third fact, the importance of which cannot be too strongly emphasised, is that there is absolute continuity between the fossil sequence and that of the life of the present time; the evidence for this is overwhelmingly strong. Present-day plants and animals descend far down into geological strata. For example, " the plants found in the Forest Bed (Pliocene) include upwards of 130 species of flowering plants which are nearly all living in Norfolk at the present day " (this and the following quotations from pp. 483, 467, 431, and 432*). In the Norwich Crag (still older) of the marine molluscan fauna " nearly 90 per cent. are still living." The gradual decrease of

* E. Neaverson. *Stratigraphical Palæontology.* 1928.

living molluscan species at earlier and earlier horizons in the Pliocene is given :

	Per cent. not known living
Icenian	11
Butleyan	31
Newbournian	32
Waltonian	36
Gedgravian	38

Lower still " in the marine Tertiary faunas, gastropods and lamellibranchs are extremely abundant, and in general approximate closely to existing assemblages, though most of the species are extinct. Among the older Tertiary floras of Britain are genera of poplar, laurel, acacia, oak, elm, willow, maple, and many genera of plants allied to those now only found in tropical countries." " By the end of Cretaceous times, the flora had assumed the general aspect that it has to-day."

These, then, are the fundamental contributions of Palæontology to evolutionary evidence.

It might now be asked whether the evidence is such as to justify a belief that life has originated in some lowly cellular organism and has continued to advance continuously through the various stages enumerated above. Some have maintained (on the basis of their interpretation of Scripture) that even in the most perfect and gradual series of fossils no proof of genetic relationship is forthcoming. On this aspect of the problem I quote from my paper "Genesis and Geology." * "For example, Davies remarks (*Trans. Vict. Inst.*, 1927, p. 38), ' What the evolutionist, to my mind, has to prove is not the succession of forms (to which the rocks give ample witness) but the actual genetic continuity between those forms. Palæontology is the only branch of science to which we can appeal for evidence upon this point and Palæontology in my experience is incapable of demonstrating continuity anywhere ' ; and again, ' there is no method known to science whereby even one single step in descent can be established apart from historic testimony,' and in support he quotes Dr. Bather (an evolutionist) as saying, ' the palæontologist cannot assist at a single birth (*Trans. Vict. Inst.*, 1926, p. 221).' " Major Davies'

* A. Stuart, "Genesis and Geology," *Evangelical Quarterly*, vol. 1, 1929, p. 350.

view will appear to many scientists to be extreme, and indeed he himself confesses (*op. cit.*) that in describing a succession of certain Tertiary Echinoderms the temptation to " regard modifications of type found at certain horizons as evidence of progressive evolution through descent was almost irresistible." In the same paper it is suggested that each group of slightly modified forms was separately created or alternatively reached their present positions by local changes in conditions (migrations ?). The present writer firmly believes in special creative acts by God but thinks that in cases similar to that quoted above the attempt to defend separate creation for each successive assemblage makes more difficulties than are necessary. For if the sequence is not admitted to be a genetic one no descendants of lower groups can occur at higher horizons. This means that either *all* the progeny migrated to another locality or that the creatures were sterile—both suppositions being more difficult of belief than that the sequence is a natural genetic one. If it be maintained that the sequence of such closely related forms is due to incoming migrations, it is difficult to see how the *accident* of migration resulted in so orderly and progressive a series. Statistical studies of such groups have recently begun. One instance will suffice in illustration, namely, the *Gryphœa* sequence in the Lower Lias (*Geol. Mag.*, 1922, p. 256). If numerous specimens are taken from one horizon, and a variation curve is made for any one character in which the group as a whole progresses, such as the coiling of the shell, it will be seen that the community is homogeneous. If the variation curves at successive horizons are plotted with respect to horizon and the number of whorls, it will be seen that whereas the group progresses as a whole, the successive curves overlap somewhat. The point to be noticed is this—that some specimens from one horizon can be fitted into place at other near horizons, but occupy a different relative position in their new setting. This is strong evidence for continuity. " Such a progressive stock must be regarded as a ' plexus ' or a bundle of anastomosing lineages " (Trueman, *Rep. Brit. Assoc.*, 1926, p. 356). Swinnerton remarks, " In no case where such careful study of the evolution of a biocharacter has been conducted has any indication of saltation been detected."* Discontinuity must, of course, occur in those characters in which a continuous mode of change

* H. H. Swinnerton, *Outlines of Palæontology.* 1930, p. 390.

is impossible, as, for example, the addition of a tooth to the jaw or an extra digit to the hand, the latter and similar variations being known amongst human beings.

The elucidation of apparent lines of descent through the geological sequence is fraught with many difficulties, mainly due to local gaps in the sequence, and to the paucity of specimens for statistical study, especially amongst the higher animals. Coulter* states, " It is something like the difference between the tracks in a switchyard and the main line. We have succeeded in investigating the switching, but the through trains are baffling."

A fair summary of the evidence supplied by Palæontology for progressive change during descent is as follows :

(1) A succession of fossil forms from extinct invertebrates to living species of mammals is seen, some groups showing apparently continuous fairly rapid changes together with short geological range, while others show little change in time, and have long geological histories.

(2) The fossil series is continuous with the present animal and plant world. (Note that the glacial period exerted an insignificant influence in the production of new forms. This is important as some writers have made the glacial period the " chaos " of Gen. i, 2.)

(3) Man has appeared very recently, geologically speaking.

The question might now be asked whether the evidence broadly outlined above is sufficient ground upon which to build a theory of evolution. For about eighty years scientists have been labouring to find a cause for evolution. They have failed absolutely. The theory of natural selection which has held the field for so long is becoming suspect in many camps. Interference with organisms by man can cause variations of small degree, but when free breeding is allowed the type seems to be preserved. Exposure of the organism to short-wave radiations alters the chromosomes and thereby induces variations, and some have therefore suggested that the cause of evolution may be due to the effects produced by some form of cosmic radiation. This is non-proven. The evidence seems to point to the fact that no changes in organisms are at present being produced by natural processes comparable with those which have occurred in the past. The literature on evolution is studded with confessions that as yet there is

* J. M. Coulter, *Ann. Report Smithsonian Inst.*, 1926, p. 325.

no adequate explanation of progressive changes, the advance of one group to another of higher rank.

So we may conclude this section by saying that there is a large body of evidence witnessing to orderly changes in organisms in the past, and that these changes appear sometimes in continuous sequence and sometimes suddenly. Secondly, the causes of these changes is not understood. Lastly, no proof exists that comparable changes are taking place in nature to-day.

Let us now discuss these findings in relation to the account in Genesis i.

The divine account begins with the assertion that God is the Creator. This is a revelation beyond the scope of science either to find out or to contradict.

It has often been pointed out how the record of the rocks parallels the account in this chapter. The only apparent discrepancy is that undoubted fossil plants are not found commonly in the earliest rocks. It is obvious that animal life needs plant life for its existence, and the discrepancy is only due to the poor preservation of the earliest flora. It used to be taught, and still is, that plant life originated in the oceans. This, as T. C. Chamberlain points out, "is . . . little more than a cosmogonic assumption,"* and both he and Osborn† express the view that plant life originated on the continents. This is in accord with the record of our ancient authority. Sir J. W. Dawson has pointed out the extraordinary aptness of the Hebrew words to designate the various groups of animals as they are brought into existence. These are: *sherets* or "swarmers," v. 20, or oviparous groups; *oph*, translated "fowl," but referring to all winged creatures; *tanninim*, elongated animals like crocodiles or Ichthyosaurus, etc., but not "great whales"; *behemah*, *remes* and *haytho-erets*, the land animals of v. 24 mean herbivorous animals, small quadrupeds and wild animals (the carnivores) respectively. The meaning of these words is made clear in Lev. xi.

This identity even to small details (so far as is possible in so simple and condensed account) of the written and the geological record, coupled with the fact that the fossil record merges without break into modern times, can mean one only thing, and that is

* T. C. Chamberlain, *The Origin of the Earth.* Chicago, 1924, p. 250.
† H. F. Osborn, *The Origin and Evolution of Life.* 1925, p. 35.

that the written account describes the record of the rocks. The evidence all points against the interpretation that the geological record can be dropped in between the first and second verses of the chapter. This theory was formulated over a hundred years ago to fit in with the ideas of the time, and was not held by either Hugh Miller or Sir J. W. Dawson, who were in a better position to assess the value of the evidence than was Dr. Chalmers in 1814. Again, the fauna of the Australasian continent bears many resemblances to the Mesozoic fauna of Europe. The New Zealand lizard *Sphenodon* survives from the Mesozoic of Europe, as does Heterodontus, the Port Jackson shark. *Trigonia*, a characteristic Mesozoic lamellibranch, is found in Australasian seas. The marsupial mammals, now common in Australia, lived in Europe during the early Tertiary and the Mesozoic. All these facts converge and lead to one conclusion, that there is no time-gap between the first and second verses of Genesis. The theological sequence of creation and " chaos," followed by reconstruction, is a scriptural one, but it can be applied only to the whole of the Creation story, the fall in Eden, and the work of redemption in Christ, which is the only " new creation " mentioned in the whole of Scripture. The philological arguments from the use of the words " tohu " and " bohu " appear to me to be forced. The idea of *chaos* is not present in the words, which mean simply " desolate " and " empty," in the sense that the earth was uninhabited. Isaiah xlv, 11, means that God went on to complete His work to make the earth fit for man's habitation, " Who formed the earth and fashioned it, Who fixed it firm, made it no waste, but for inhabitants " (Moffat). With Dr. Yahuda, I believe that Genesisi, 1, is just a plain statement of fact amplified in the rest of the chapter.* It follows that the creative days (referred to as one day in the second chapter) are not of twenty-four-hour periods. Sir J. W. Dawson says, after discussing the meaning of the *Olamim*, or ages of Psalm xc, " That this idea of long creative periods has been obscured in our time, is one of the lamentable inheritances of the Middle Ages. It is time now to revive it, not only in learned discussions but in popular teachings."†

The orthodox Christian exegetists, who emphasise the use of

* A. S. Yahuda, *The Accuracy of the Bible.* London, 1934, p. 139.
† Sir J. W. Dawson, *Modern Science in Bible Lands.* London, 1888, p. 16.

the word "*bara*"—"to create," in vv. 1, 21 and 27, do not explain the surprising omission of it from verses 11 and 24 where one would naturally expect to find it. In verse 11 the command is "Let the earth bring forth" and in verse 24 the same command is coupled with "*asah*"—"to make." The use of words is very significant in Scripture. "Holy men spake as they were moved by the Holy Spirit." So there must be some difference between the operations differently described. The word "*bara*," while it is mostly used to describe a creative act bringing into being something which has never existed before, and an act complete in itself, is used in another sense as of a continual creative process, as in Psalm cii, 18, "The people which shall be created" (*see also* Is. liv, 16; Ezek. xxi, 30; Mal. ii, 10). I do not suggest that it is so used in Genesis i, but the fact should be borne in mind. "*Bara*" evidently means in Scripture the act by which something is brought into being which no process in operation at the time would do by itself. Now, as I pointed out in the discussion on the recent paper by Dr. Clark, observation shows that associated phenomena are related to one another as alternate series of crises and processes, or, to put it another way, by causation and development. Take, for example, the crisis of conception, the process of growth during gestation, the crisis of birth, the process of growing to maturity and old age, the crisis of death; the process of the work of the Spirit of God upon an individual, the crisis of conversion, the process of growth in grace and in the knowledge of Christ, the crisis of the freeing of the spirit from the body, etc. It is my conviction that the word *bara* records the major creative crises in the record of events, and that *asah* and its accompanying commands indicate the processes following the causative act of God, being all the time directed and controlled by Him. There is nothing, it seems to me, in either the Bible or in science to forbid the interpretation that evolution, in the restricted sense of variation during descent, has actually taken place, and that what the scientist calls organic evolution and endeavours to explain by such a theory as that of natural selection is only the evidence of the processes which God originated by creative acts. It is very significant that just as the astronomers and physicists are being compelled to suggest that ultimate reality may be mental or spiritual, so certain evolutionists are showing a change of viewpoint. Almost the last words in a recent symposium on evolution were to the effect that evolution does

not get rid of God but only demonstrates how He works.* Berg also, the Russian scientist, in his book on Nomogenesis, or Evolution by Law,† states that he believes that some directive force, working according to a law not yet understood, was the controlling factor.

Against the view that progressive change has taken place, it is sometimes urged that the plain meaning of the words " after his kind " forbid it. Yet if the use of this phrase in Lev. xi is studied, it will be seen to be used to express the idea of a group which shows variation.

After the creation of man it is said (Genesis xi, 2, 3) that God " ended the work which He had made " and " rested from all His work which God created and made." This *creative* work, and this alone, having been finished, it would follow that both the apparently continuous and sudden changes in organisms would cease. If this is correct, science will not be able to find evidence that evolution is now proceeding, and any arguments against evolution based on the study of modern forms lose point, and do not prove that such changes *never* took place.

I have no space on this occasion in which to deal with the thorny problems of the origin of man, but the following remarks can be made :

The words " in the image of God " cannot refer to man's body, for God is a spirit. The important thing is that man came into existence as the result of a creative act, and not as the result of any process which was in operation previously. Man, to the scientist, is a tool-using animal, but this definition will not fit the biblical description. Man's moral and spiritual nature is the result of the special creative act of God. This much is very plain. Biblical chronology (Ussher) places the appearance of Adam at about 4000 years B.C. There are many other computations on the same evidence up to over 6,000 years. Man appeared in the Pleistocene, and recently, by a new method of counting the layers in " varved " clays formed by the outwash muds from glaciers, de Geer has been able to date much more certainly than has been possible heretofore the end of that period. The end of the Ice Age in Norway is reckoned to be about 8,700 years ago. (*Science Progress*, vol. xxx, 1935, No. 117.)

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* H. H. Newman, *Creation by Evolution*. London, 1934, p. 370.)
† L. S. Berg, *Nomogenesis*. London, 1926.

The only points I wish to make in conclusion are these: Much of the attack prosecuted by orthodox Christians on the doctrine of materialistic evolution has, I believe, wasted much time and effort in trying to throw doubt upon the geological facts on which the theory has been based. This is a hopeless task, for there is plenty of evidence which will reasonably support a belief in progressive organic change, and this is the reason why I believe that the world of science goes on calmly and takes no notice of the wordy warfare. In all humility, may the suggestion be made that the time has come to combat the evils of materialistic evolution, not by decrying science and scientists but by positive statement of our belief in God as Creator, and a fearless presentation of the Gospel of Christ? Only thus will we get the ear of the outsider, whom we have antagonised by our preoccupation with unessential things.

Discussion.

The Chairman (Mr. W. E. Leslie) said: In order to save time, I will not comment on the paper. Within recent days I have talked with two young men. Both were evangelical Christians. Both were scientific workers. Both said they found it necessary to keep their science and their Christianity in watertight compartments. That is morbid and dangerous. The fault lies with those elders and teachers to whom these young men (and thousands like them) have the right to look for help. The help is too often not forthcoming—perhaps because of laziness, perhaps because of the pride that will not admit ignorance or tolerate contradiction. Whatever may be thought of the merits of the paper, it is at least an honest attempt to meet the situation.

Mr. Douglas Dewar said: Mr. Stuart shows much greater independence of thought than do most present-day geologists and biologists. He has taken a bold step in asserting that evolution is no longer going on, is a thing of the past, and I hope that one day he will "go the whole hog" and doubt whether evolution has ever taken place.

As I recently in this room commented on the radio-active method of estimating the age of the rocks, I will now only repeat that the

method is based on unproved assumptions, one of which, that radio-activity took place millions of years ago at the same rate as now happens, we certainly cannot demonstrate. Indeed, Mdme. Joliot recently at Cambridge, gave reasons for thinking that formerly it was much more rapid than it is to-day.

Mr. Stuart, in accepting supposed Pre-Cambrian fossils as such, does not seem to be aware that in 1935 Dr. Percy Raymond, President of the Palæontological Society of America, as a result of a careful scrutiny of all such supposed fossils, rejected out of hand all save three, viz., what he thinks *may* be burrows of worms, what *may* be the products of brown algæ, and *Beltina* ; but of this last he says : " Unfortunately it cannot be accepted until checked by later discoveries." I reject these because, if the evolution theory be true, the pre-Cambrian seas must have swarmed with animals, and their sediments should hold large numbers of fossils. Three possible kinds of fossils is an impossible number. It is a case of many or none at all.

The rocks seem to indicate a great creation at the beginning of the Cambrian period.

Succession does not necessarily imply descent. Archæology shows that the Romans appeared in England before the Saxons, and the Saxons before the Normans, but this does not prove that the Romans originated before the Saxons, and the latter before the Normans. Mr. Stuart, in common with almost every other geologist, makes the great mistake of believing that there is a necessary connection between the date of the first appearance of a group of organisms as fossils in the rocks known to us and the date of the origin of the group in question. The greater number of fossiliferous rocks known to us were laid down under the sea, and are formed largely by sediments derived from land. Thus the fossils they contain are only of marine animals that lived *near the land.* The fossils tell us nothing of the aquatic organisms that lived far out at sea. Rocks laid down on land are eroded away so rapidly that none laid down in the Cambrian, Ordovician, and Silurian periods has been preserved. For all we know, the earth may have had a rich land population during these periods. The fact that a great and diversified land flora extending from Spitzbergen to the Falkland Islands appears in the Devonian must mean, on the evolutionary hypothesis, that land

plants existed millions of years before the Devonian period. The Palæozonic and early Mesozoic land rocks known to us are almost certainly those laid down in very low-lying areas which happened later to become submerged beneath the sea and there became preserved owing to being covered by protecting sediments, and have been subsequently re-elevated. The fossils in these rocks are those of the comparatively small part of the land floras and faunas inhabiting the earth. The known rocks tell us nothing about the early inhabitants of the highlands and mountains. In no other way is it possible to interpret, on an evolutionary hypothesis, the sudden advent of a great and widespread host of flowering plants in the Cretaceous, and of placental mammals in the Eocene. Clearly the Devonian and Cretaceous floras and the Eocene placental mammals were either specially created in those periods or they migrated to the regions in which their earliest known fossils occur.

A most significant fact is that no new order of plants or animals has appeared in the rocks since the beginning of the Oligocene period. The explanation of this is, I believe, that not until the Tertiary do we know any rocks laid down in elevated regions. Another significant fact is that every great group of animals and plants appears abruptly in the rocks in considerable diversity, exhibiting all the pecularities of the type and, after its first appearance, each group undergoes little or no modification.

Lt.-Col. SKINNER said: The author has given us a very thoughtful paper, on which one would like to make many appreciative references; but our time is limited and I must confine myself to two points, and those by way of criticism. First of all, on page three, he challenges Dr. Bell Dawson's query, "Yet how can Science expect to reach right conclusions if it does not accept as its starting point the great foundation truth that God is the Creator?" May I put the question another way? "How can science expect to reach correct conclusions while ignoring, on one hand, the clear evidence in nature of a directive mind, and on the other, the palpable evidence in history of the antagonistic working of supernatural powers of good and evil?" Science says, in effect, "We cannot see these powers." Neither can science see electricity.

Secondly, in his penultimate paragraph, the Author says, "The words 'in the image of God,' cannot refer to man's body, for God is

a spirit." On the surface this appears indisputable, and in fear lest the stigma of anthropomorphism attach to our reading of the Scripture, we clutch at it as an axiom. Yet I venture to submit, very reverently, that this dictum, so simple and obvious, does not fully satisfy the content of the actual words of Scripture. Consider briefly the following passages: (Gen. i, 26, 27; II, 7), "And God said, Let us make man in our image, after our likeness . . .; So God created man in his own image, in the image of God created He him; male and female created he them . . . And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul."

I think we shall all agree that, with man, God's creative activity reached its culmination. In that wonderful unveiling in the viiith chapter of Proverbs (from ver. 22 on), we see how all the works were directed to the earth being made habitable for man, and led up to the climax of his creation (v. 31) "my delights were with the sons of men." That was the purpose of God, to prepare a worthy place for habitation, and there to place a being fit to inhabit it and fit for fellowship and co-operation with himself. And it is of this being that we read, "So God created man in his own image, in the image of God created he him." Now while it is indeed true that "God is spirit," and equally true that "No man hath seen God at any time," it will not be disputed that, despite man's disobedience and fall, God has manifested Himself to man in the course of history many times. Consider the indubitable theophanies of the Old Testament:—the appearances to Abraham (Gen. xviii, 1, 2, 16–22, 33 and xix, 1); as Captain of the Lord's host to Joshua (v, 13–15); as the Angel of The Lord to Gideon (Jud. vi, 11); and again to Manoah (Jud. xiii, 3, 22, 23). In every appearing it had been as a man; a glorious being, if you will, but nevertheless in human form. Then lastly, His appearing in the person of His well-beloved Son. Does any one say, "It is only natural that God should appear in the form most familiar to man?" My reply would be that, inasmuch as man had been created in the image and likeness of God, if God were to manifest at all, it could scarce be in any other form than that created by Himself to bear His own impress. There is profound mystery here and we may not dogmatize, but lest the thought be deemed unscriptural, hear what St. Paul, whose

knowledge of divine mysteries was unexcelled, has to say : (Col. i, 15, 19, Weymouth's translation), " Christ is the visible representation of the invisible God, . . . for it was the Father's gracious will that the whole of the divine perfections should dwell in Him " ; (ii, 9, A.V.), " For in Him dwelleth all the fulness of the Godhead bodily." Or the writer to the Hebrews (i, 3, R.V.), " Who being the effulgence of His glory, the very image of His substance " (A.V., " the express image of His person ").

Or again, Our Lord's own word to Philip, who had asked, " Lord, show us the Father and it sufficeth us." " Have I been so long time with you and dost thou not know me, Philip ? He that hath seen me hath seen the Father."

Surely, then, in the human form alone, with all the marvellous faculties of its endowment, and independent of spiritual equipment, may there not (must there not) be something reflecting the mind, even the form of God ; something that cannot be predicated of any other creature ? Manifestations of His power and wisdom we may find in all His works in nature, but manifestation of His person in man alone.

Why stress the point at all ? Because I feel it is better to take the word in all its simplicity, just as we find it, unexplained (unexplainable, if you will), than to play for safety with a popular exegesis that puts asunder what God hath joined together in distinct creative act, and inevitably lends itself to keeping alive the pagan philosophy of organic evolution.

Mr. L. E. Jose said I wish to ask two questions of the lecturer: (1) Is it a fact that the successive stages of the geologic series are, as a rule, homogeneous ? Each fossil being of the same form as all the others of its kind in the same layer, but differing slightly from the examples to be found in the strata above and below ? (2) In so far as this is the case, does it not follow that any conceivable evolution must also have been homogeneous ? All the members of a species developing simultaneously in a similar manner, whether in an evenly advancing wave, or in sudden simultaneous changes ? If there had been structural differentiation of individuals in the struggle for life, some more advantageous, some less so, then we should expect to see fossil variations side by side in the same strata, *i.e.*, heterogeneity, not

homogeneity. But simultaneous variation appears to involve an active principle in each evolving species, quite independent of competition, or environment, or any other incidental circumstances.

These may be the elementary questions of an amateur. But the answers to them are of obvious importance, and experts are remarkably silent on the subject.

Mr. GEORGE BREWER said: On page 105 this statement occurs: "The philological arguments from the use of the words 'tohu' and 'bohu' appear to me to be forced. The idea of *chaos* is not present in the words, which mean simply 'desolate' and 'empty' in the sense that the earth was uninhabited." Gen. i, 1, states "In the beginning God created the heaven and the earth." Verse 2 does not mention heaven, but states that the earth was "without form and void." Dr. Young in his literal translation renders the passage "the earth hath existed waste and void." The inference would be that a serious catastrophe had taken place, the result of Divine judgment. The fact that the life germ of seeds remained in the earth, as implied in verse 11, shows that the earth was originally in a perfect state as it came from the creative hand of God. This gap between continuous passages of scripture is not an isolated instance; the same occurs in Isaiah ix, 6, "Unto us a child is born, unto us a Son is given: and the government shall be upon His shoulder." Nearly 2,000 years have elapsed between these two statements, and the second is not yet fulfilled. Again, in Isaiah lxi, 2, "To proclaim the acceptable year of the Lord, and the day of vengeance of our God," the last being still unfulfilled.

On page 107, line 8, the statement that the words "after his kind" does not necessarily forbid the idea of organic evolution seems appalling. That many varieties occur within the species, occasioned by environment and other causes, is generally admitted; but these are within clearly defined limits, as proved by experience in the case of both plants and animals. Again and again in Gen. i, the truth is clearly emphasised, that both in the special creations, and in the commands for the earth and waters to bring forth that which was already in them, it was to be "after their kind," and in verses 11 and 12, the additional statement is added "whose seed is in itself." This basic truth is confirmed in 1 Cor. xv, 39,

" All flesh is not the same flesh : but there is one kind of flesh of men, another flesh of beasts, another of fishes, and another of birds."

On page 107 it is stated that " the words ' in the image of God ' cannot refer to man's body." Of course not! They can only refer to the whole man, spirit, soul and body. How can a spirit be said to be an image, which must be visible ? Our Lord is stated in Col. i, 15, to be " the image of the invisible God," and Heb. x, 5, states concerning Him, " a body hast Thou prepared me." In view of these, and other scriptures, to suggest that God may have used the bodies of the lower animals in the creation of man, appears to me to be unthinkable, and a needless concession to the speculative theories of Evolutionists.

WRITTEN COMMUNICATIONS.

The PRESIDENT (Sir AMBROSE FLEMING, F.R.S.) wrote : This paper by Mr. Stuart is an attempt to deal with some of the difficulties which present themselves in comparing statements in the Bible con cerning the origin of the Universe, this earth and the living organisms on it, with the explanations and theories offered by branches of modern science of the same events.

These difficulties, so far as they are real and do exist, arise from the fact that the aims, methods of approach and postulates are different in the two cases.

Science has as its true object of research the external world appealing to our senses, and especially the quantitative relations in it. Lord Kelvin once said " Science is measurement." The implement of research is the human intellect operating in certain ways by and through experiment, observation and logical deduction therefrom. The postulate is the possibility of reaching truth by these means within a certain range of subject-matter.

On the other hand, the wonderful literature we call the Bible has certain qualities which show that it is not simply the product of the unassisted human intellect but is superhuman.

Although these books have been written by men, they contain predictions of future events impossible to man, part of which have been fulfilled exactly. But they are chiefly concerned with the prediction, arrival and work of an historic Person who was human

yet much more than human because he had powers altogether superhuman and Divine, whose work was and is, the redemption of Man and making known to him the Will of God.

The aim of the Bible is then to explain Man to himself, his special origin, primary perfection, downfall and mode of redemption and restoration to an intended relation to his Creator. Man was and is quite incapable of attaining this knowledge by the use of his own intellectual faculties.

To gain truth in Science we have to approach the task without any previous assumptions and allow facts to teach us. But in the case of the Bible the truth of its statements is certified to us by the mysterious yet forceful appeal it makes to the human conscience, affections and hopes and fears of man in a minor degree by historical archæological and linguistic research.

The faculties brought into play are different in the two cases. In scientific research they are the senses and intellect of man. In the case of the Bible they are for the most part the faculties called spiritual which are receptive and responsive and kept alive by a willingness to put into practice the truths it reveals as far as they are perceived or known.

The Bible does not give much assistance to a merely intellectual curiosity about beginnings of things or past events. Its purposes are chiefly practical and concern human conduct. The accounts in it of supernatural occurrences are unacceptable to, and rejected by many minds.

The Bible itself predicts this, for it says (1 Cor. ii, 14) "The natural man receiveth not the things of the Spirit of God; for they are foolishness unto him neither can he know them because they are spiritually discerned."

Also Christ himself said: John vii, 17, "If any man will (*i.e.*, willeth to) do his will he shall know of the doctrine, whether it be of God or whether I speak of myself."

Accordingly the so-called difficulties between Science and Religion may be very much the making of our own minds if we assume that the Bible statements have to be confirmed by, or brought into agreement with, human explanations or theories before they can be accepted as true; or that nothing is true unless it is comprehensible to the human mind and can receive a naturalistic explanation.

Up to 70 or 80 years ago nothing more than vague suggestions had been made for giving an explanation of the existence and appearance of the vast number of forms of animal and vegetable life on our earth in terms devoid of what are called supernatural suppositions.

But in 1859, Darwin published his theory of natural selection which was hailed with delight by many because it almost abolished any need for mentioning the word " Creator." Darwin himself had, however, found it was not possible to avoid its use entirely as shown by the last sentence in his book " The Origin of Species."

An intensive scrutiny of his hypothesis in the last forty years has, moreover, brought to light its insufficiency and defects. Hence many naturalists have criticised or condemned it.

Nevertheless, there is a most extensive use of the word " Evolution " to cover and describe any processes known or unknown which can be hypothecated to account for this multiplicity of living organisms and in general exclude the idea of a Personal Self-Conscious Creator as their source. On the other hand, it has been used in a limited sense to cover a mode or means of Creation.

Hence qualifying words have been added such as " Creative Evolution," " Emergent Evolution " or " Guided Evolution."

But such terminology does not lead to any scientific knowledge and on the contrary has done much to undermine or destroy belief in the truth of the Bible.

The important question is whether the intellect of man in its present condition *is* capable of understanding or discovering the precise methods of Divine operations in Creation. Can we discover, for example, exactly how the miracles of Christ were effected ? He converted water into wine, multiplied bread to feed thousands, created shoals of fish in lakes, cured chronic disease, stilled a storm, and raised the dead by a word.

No naturalistic explanation of these events can be given in terms intelligible to the human mind at present. We must either accept or reject the accounts. There does not seem to be an adequate basis for the supposition that these " mighty works " are merely miracles in the same sense that X-rays or wireless broadcasting would be miracles to unscientific peoples now.

The Author admits, and I agree, that it does not eliminate the

miraculous action to assume, even if true, that some secondary agencies have interposed between the Divine Will and the event. If the walls of Jericho fell down by an earthquake or Elijah's sacrifice was consumed by a flash of lighting, we are still in ignorance of the way in which these so-called natural agencies obey their Creator.

The whole of the events in the Universe of things are at every moment a manifestation of the Will of God, whether those events are part of an orderly continuance or are of an exceptional character for a certain purpose; and Science moves altogether out of its proper field in endeavouring to explain how any part of these events can take place of themselves and independently of that Will.

The paper under discussion is somewhat difficult to analyse in such way as to determine what it is the Author considers he has proved or disproved. If I am not doing him an injustice, he seems to deduce from the palæontological record in the earth that in connection with the appearance of living organisms on it there have been certain more or less sudden changes in, or appearances of types to which the word " Creation " must be applied, but that there are other series in which the changes are so gradual that the word " Evolution " in a modified sense may apply. But that the causes of these slow modifications are not known. This is very much the view held by the late Dr. H. F. Osborn, at one time head of the Natural History Museum of New York. I submit, however, that whether there has been a sudden or gradual change, the result is not spontaneous or automatic and the word " Creation " applies in both cases.

The Author administers a rebuke to some believers in the veracity of the Bible for ill-advised attacks on some conclusions of science or invalid arguments against evolution, and compares it with theological opposition in the Copernican theory. He forgets, however, that some great astronomers like Tycho Brahé did not accept that theory and that Galileo's troubles chiefly arose from his breaking his own promise not to *popularize* a theory not yet generally accepted, which he did do in his book *Dialogues Concerning Two Systems of the World.*

The opposition of religious people is not to adequately certified scientific knowledge but chiefly to the reckless popularisation of the unproved hypothesis of the automatic evolution of the human race

from animal ancestors, a statement which inevitably leads to a disbelief in, and rejection of, all Scripture teaching as to the nature, responsibility and salvation of man. The publication in illustrated papers of imaginary pictures of low-browed brutal faces labelled reconstruction of Java, Pekin, or Heidelberg " man, " or of gorillas labelled " man's cousin " and suggestions that they are proofs of man's evolution from animals has worked untold harm. The embracing of these ideas by some religious teachers is an irreparable disaster and is the direct cause of much irreligion of the present day because it deprives their teaching of any vitalising power.

Lt.-Col. L. M. DAVIES, M.A., F.G.S., F.R.S.E., wrote : I appreciate the Author's desire to support belief in the Bible ; but since he attacks other—and in my opinion sounder—methods of doing the same thing, I feel compelled to criticise. He raises so many issues, however, that I can only touch on a few of the points on which I disagree with him. Thus, on page 7, he emphasises as a " fact " the " absolute continuity between the fossil sequence and that of the life at the present time." How, then, could an authority like J. A. Thomson tell us that : " In regard to the origin of domesticated animals and cultivated plants we remain in great obscurity. In regard to the actual pedigree of wild species we are in still greater ignorance " ? (*Heredity*, page 137.)

As a stratigrapher and palæontological research worker, I am always dealing with supposed fossil genealogies, and explained the weaknesses of this line of evidence in my paper on " Evolution " (*Trans. Vict. Inst.*, vol. 58, 1926, pp. 214–252). Apparently the author, who refers to that paper, thinks it enough to state that my " view " would appear " extreme." He makes no attempt to answer a single one of my criticisms of the value of fossil evidence, or to show how continuity can be established where I show it to be simply assumed. Apparently he thinks that " variation curves," etc., where fossil variants happen to be found in great numbers, establish universal continuity. But such cases are extremely rare, and prove no more for continuity in general than the quoting of a connected clause or two from a book would prove that that book was not divided into chapters. What is more, exactly similar variation curves can be produced in relation to man-made machines,

where genetic continuity is out of the question. And I have seen how such nicely prepared curves can collapse ; for my experience is that the more fossil discoveries multiply the more do ideas of fossil connections have to be modified. I would point out that the most experienced palæontologists are generally the most cautious in accepting the validity of fossil genealogies. " It is impossible," declares Dr. Lang, F.R.S., the present Keeper of Geology at the British Museum (Nat. Hist.), " to prove a true lineage, and extremely improbable that we can ever produce anything but an approximation to one " (*Proc. Geol. Assoc.*, vol. 41, 1930, p. 178). Similarly Charles Depéret remarked, in regard to all fossil ancestries, that : " The genealogical trees we are able to draw up are subjective to the feeling of each observer " (*Trans. Animal World*, p. 114). In other words, as I insisted in my paper, there can be no guarantee of genetic connection between any two supposed fossil " ancestors " ; and so the effects of fossil evidence depend entirely upon our susceptibility to superficial appearances of proved unreliability. The Author's susceptibility is obviously higher than mine, since he (p. 102) cannot understand my refusal to accept such an appearance. In that particular case, it was as well that I did not, since further examination showed that each of the seeming links was specialised out of true series.

The Author seems to think that evolution can be squared with Genesis if we allow that evolutionary changes were God-impelled. But this device merely falls between two stools ; for consistent belief in Continuity has no room for such a compromise on the one hand, and Scripture is equally opposed to it on the other. We have merely to ask ourselves how the account of the creation of Eve is to be squared with it. The deep sleep into which Adam was put—the rib removed from his side—the flesh closed up in its place—the rib formed into a woman and brought to the man, etc., all oppose the idea that human beings resulted from the simple expedient of giving spiritual powers to the progeny of apes.

As to the " gap " theory, the Author is obviously not very well informed. Hugh Miller did accept it at first, and only abandoned it on account of his dogma that a Creator could not have created the same species twice over—an idea to which Scripture is definitely opposed. This doctrine of separate creations which Hugh Miller

abandoned was still supported, nevertheless, by other geologists like Greenough, d'Orbigny, d'Archiac, Sedgwick, Agassiz, Élie de Beaumont, Barrande and many others. Since Barrande's life overlapped my own, that doctrine may be said to have continued to the present day; so it is hardly correct to suggest that it was only maintained by a half-informed clergyman in 1814. Mr. Stuart's Bible exegesis is also not very accurate on this point; and he omits to notice quite a number of essential facts which tell quite strongly in favour of the " gap " theory and against his own. Unfortunately, space does not admit of my saying more on that subject here.

Dr. E. CECIL CURWEN wrote: I feel that Mr. Alan Stuart's paper is one of the most sensible and constructive contributions to the literature of this subject that I have read for a long time. I would particularly like to endorse some of the points he has made, and feel that in approaching this subject attention should be paid to the following points:

(1) In studying the Biblical narrative it is essential to find out the meaning it conveyed to the ancient Oriental minds for whom it was written under the Holy Spirit's guidance, and for this we must divest our minds of some of our Western literalism.

(2) We must be ready to admit the observed facts of science bearing upon the origin and early development of Life and of Man in geology and archæology, while distinguishing them from the superstructure of atheistic philosophy which has been built upon them under the influence of anti-religious feeling.

(3) We must concentrate on the extremely rich spiritual significance of the early chapters of Genesis, and rest assured that if we understand this aright, the rest will in due course unfold itself.

(4) Much harm can be done by bull-headed attacks on " Evolution," which confuse fact with inference, and which to the non-Christian scientist only proclaim that their authors have insufficient insight into the questions involved.

Dr. J. BARCROFT ANDERSON wrote: If Mr. Stuart will reconsider the matter, I think he will admit that the Adam was shaped in his creator's physical likeness, the likeness of Him Who was " first formed of all formation; because by him were formed all things,

in the heavens and upon the earth, the visible and the invisible, whether thrones, whether lordships, whether virgins, whether powers " ; (Col. i, 15 and 16). The first time Joshua saw his Creator, he took Him to be a man, saying " Art thou for us or for our enemies?" It is also recorded what " Jehovah " there and then said to Joshua.

As regards Adam's " *moral and spiritual nature* " the record is in Gen. vi, verses 5 and 6. " And Jehovah was seeing that the Adam multiplied evil things on earth, and every plan of design of his heart, only downwards all the days. And Jehovah was repenting that he shaped him the Adam by earth : and he was grieving himself to his heart. And Jehovah was saying : ' I will be suppressing him the Adam whom I brought into existence, from upon the face of the Adame-eh ; from Adam to beast and creeping thing, and bird of the heavens, for I have repented that I have shaped them'."

Thus the penalty of the Flood was the consequence of Adam's " *moral and spiritual nature.*"

Lt.-Col. P. W. O'GORMAN, C.M.G., M.D., M.R.C.P., etc., wrote : Having heard and later read Mr. Stuart's interesting paper, I beg leave to submit a few comments.

1. " Ultimate reality " is, of course, God, the Creator and maintainer of the whole Universe.

2. Religious leaders naturally depend for their knowledge of science on the accepted views of the scientists of their day.

3. But science is not permanently fixed but varies from day to day. Forgetful of this and notwithstanding that scientists are not infallible, they are notoriously very conservative of, and insistent on, their own opinions, and highly antagonistic to, and combative against, contrary opinions. So absorbed are some of them in their own ideas, and so lost in the particular pursuit of their special hobby that they begin with a possible assumption—a working hypothesis, warm themselves up to believe it to be a theory—a probability ; and, too frequently, in a fog of verbosity take its proof to be granted and talk of it as a fact. It is a very human failing and accounts for much of the confusion we experience, as evidenced among evolutionists Once involved in championing its truth, it is very difficult to crush

animosity, eat humble pie, and recant when its falsity has been demonstrated.

4. In the time of Galileo, Columbus, and Bruno, the whole world, scientists in particular, continued to maintain the ancient Ptolemaic geocentric theory, which only the insane would deny. The religious authorities, children of their age, could hold no less. Consequently when sacred Scripture, which was the inspired word of God, was temerariously assailed directly or indirectly as false, the Church as its official guardian grew alarmed and became censorious.

5. Unfortunately Galileo (born 1564, d. 1642), like so many of his kind, was untactful and perverse, jeered and scoffed at his fellows, made solemn promises and broke them, and so suffered. Curiously, his contemporary scientists, stung by his behaviour, refused even to peep through his newly-invented telescope. Altogether he was not badly treated. Cardinal Bellarmine, the greatest theologian of that age, and other theologians, intimated that if Galileo would really prove his theory, the Church would accept it and interpret Scripture accordingly. But he could not prove it, except by analogy, nor, in fact, could it be proved till further relative scientific discoveries were made some years later (Newton's *Principia* in 1696). Thomas Huxley, who personally examined in Rome all the documents concerned, declared that the Ecclesiastical Courts which condemned Galileo had really the best of the argument. As a matter of fact, Nicholas de Cusa (died 1464), many years before Galileo, had already propounded this very heliocentric theory, and it was developed by Copernicus (died 1543), who dedicated his book to the reigning Pope.

6. We are living in more tolerant times, that is, times in which the ultimate destination of our souls seems to be regarded with much indifference, and not as in days of yore when one soul, for whose salvation the God-man Christ died, was considered infinitely more valuable than the entire universes of countless myriads of material stars. Scriptural interpretations must accordingly be viewed in relation to that fact—" with fear and trembling " as St. Paul warns us, for our Lord Himself says : " what shall it profit a man if he gain the whole world but lose his soul ? " Reliance, therefore, on scientific discoveries must be not absolute or final but tentative,

and their light on difficult passages of Scripture, while gratefully received, must be utilised with particular caution. Is it not the failure to observe this rule that has led the Modernists to jump to erroneous conclusions of great moment ?

7. Mr. Stuart rightly insists that science is experimental knowledge and deals with facts as discovered. It has nothing to do as such with inferences drawn from them, which may or may not be right. Such speculations are in the province of philosophy. Nor has science anything to do with original or ultimate causes. It has to do with physical facts known or discovered and their logical results. Hence it is not necessary for science to assume that there is a Creator. Nevertheless, I think it will be admitted that both philosophy and revelation, together with the Natural Moral Law implanted in the minds of all men (*See* Rom. ii, 14, 15), are to act as controlling guides. Some people imagine that scientists are at full liberty to do the utmost to acquire and use whatever experimental discoveries place before them. But personal responsibility for the dangerous uses that certain discoveries may probably lead to, warns the discoverer not to make them known. Discovery of extremely shattering explosives or extremely deadly poisonous gases are instances.

8. A Miracle may be defined as the unusual supervention by the power of God, of a superior force to overcome an inferior one. It is not a violation of law, it does not abolish the regular relation of cause to effect, but it only interrupts, as a special exception, the operation of a particular effect, or interposes a superior cause. And it has as its aim a supernatural reason. God works by the utilisation of His own gifted natural laws. Hence the case of the possible coincidence of trumpet and earthquake in the fall of the walls of Jericho is rightly accepted as a miracle by Mr. Stuart, despite the fact of the frequency of earthquakes in that region.

9. St. Augustine, one of the greatest exegetes of the Church, says : " When in the pages of the Sacred Writ I come upon anything that is contrary to truth, I judge that the text is faulty, that the translator did not strike the right meaning, or simply that I do not understand it." (Letter to St. Jerome.) We may add that when science has established a *certain* truth, it cannot conflict with a *certain* truth of faith : for God is the author of both and cannot

contradict. If science seems to conflict, then it is either itself wrong or the interpretation or application is faulty.

10. The question of man being made in the image and likeness of God suggests three explanations:

(1) As God is a Spirit, so man's soul is created a spirit. (2) As God is Intelligence, so man's soul is endowed with intellect—reason. He is a rational being. (3) As God creates, so man—a composite of body and soul—propagates his kind. Hence the express mention in one of the texts in Genesis of the two distinct sexes. Man is also an inventor and makes things. But God is pure spirit, pure intelligence, and "creates" out of nothing. Man is only a creature in the image and likeness of God, and cannot, of course, create out of nothing. The soul of man, being a simple non-composite spiritual or immaterial intellect, capable of abstract thought, independent of matter (unlike the animal), cannot die, that is, be de-composed; and hence is immortal. And hence God alone can create the human soul, matter cannot generate or evolve it. Animals and vegetation reflect only partially their inferior likenesses to man, and hence less so to God.

W. Bell Dawson, M.A., D.Sc., M.Inst.C.E., F.R.S.C., wrote: The Scriptures maintain that the works of God in the visible universe are sufficient evidence in themselves to make clear "His eternal power and godhead." In what we see around us, there is thus evidence to show that there must be an intelligent Creator; except to those whose "foolish heart is darkened." We are further expected, when we do recognise a Creator, to be thankful to Him because His works contribute to our benefit. This implies that a Personal Creator is acknowledged, to Whom we should give thanks. All this is plainly set forth in Romans i, 20–22.

On the other hand, we cannot know the plan or purpose of God for mankind, or His Way of Salvation and Redemption, without a revelation from Him. This is made plain by the instructions and revelations which God gave to man from Adam onward to the end of the Bible.

Author's Reply.

My main object in writing this paper was to suggest that it makes no fundamental difference to any Biblical doctrine if the work of

Creation described in Genesis i is regarded as a series of crises and processes initiated and directed by God, and that it is these *processes* which have given rise to the phenomena upon which scientists have based the theory of evolution. I have tried to demonstrate that the account itself may so be interpreted without doing violence to the text. Indeed, the very words used seem to suggest the view I advocate. To interpret the evidence, both Scriptural and geological, in this way does not modify the fundamental beliefs of evangelical Christianity. The truths that God is Creator; that man is unique in his moral and spiritual nature; that man suffered the Fall by disobedience to God and needs redemption in our Lord Jesus Christ, remain, with all the other fundamentals. The position I have reached is one into which I have been forced by greater knowledge of attested and proved facts in my own and other sciences, but the change in my interpretation of certain of the Holy Scriptures has not in any way lessened my belief in them as the Word of God, nor taken anything from their Divine authority.

I have been somewhat disappointed that much of the criticism of my paper has neglected this side of the question, and concerned itself with a reiteration of the stock arguments against materialistic evolution so common in evangelical anti-evolution literature.

This preamble is, I think, an answer to Sir Ambrose Fleming's statement that it was "difficult to . . . determine what the author thinks he has proved or disproved." I did not set out to prove or disprove anything, but to state an interpretation of the Scriptures which had for me, an evangelical Christian, succeeded in bringing into one compartment of my brain my science and my beliefs, without altering in any way the fundamentals of Christianity. I put forward my views (not in any way new or revolutionary), in the hope, first, that some of my young brethren in the Faith, who may be in the quandary mentioned by our chairman, might be helped by seeing that the work of Creation has not necessarily been exclusively catastrophic, and second, to make a plea that only those who have real knowledge of what they are discussing will enter the lists against materialistic evolutionists. Much harm has been done to Christianity by ignorant controversy.

I agree with Sir Ambrose that the Scriptures do not need the confirmation of science before they can be accepted as true, but I

suggest that the established facts of science may help us to attain the most reasonable interpretation of scriptures which deal with the world of nature. This does not mean that miracle is put out of court, as I have shown in my paper. I cannot see how the use of any *terminology* " can undermine or destroy belief in the Bible," as suggested by Sir Ambrose. If such terms as he quotes have been used to " cover a mode or means of Creation " they indicate a step away from mere materialistic doctrine. To some people the term " creation " means only the sudden appearance of something where nothing existed before, and to many the term " evolution " means simply an atheistic theory which has been the means of destroying the faith of thousands in God, and which has no more basis for its existence than the nightmares of deluded scientists. Between these two extremes some acceptable term is necessary to describe the creative activity of God, which I believe includes both sudden crises and slower continuous changes.

I, too, am opposed to the presentation to the public of unproved hypotheses *as if they were established truths*, but I also deplore the attitude of those who, in denying the truth of a hypothesis, deny also facts which are certified as true by all who are competent in the subject.

Mr. Dewar does not guide me by giving any reference to Madam Joliot's statement, so I quote the following in answer to his suggestion that radio-active processes may have varied in rate through geological time. " The variation of the rate of radio-active generation of lead isotopes in the Earth during geological time is believed with ever-increasing confidence to be completely in accordance with the disintegration theory of Rutherford and Soddy, and to vary in no other way whatsoever . . . the nature of the evidence has been summarised which leads to the conclusion that there is nothing in the terrestrial environment—including changes in space or time, temperature or pressure changes, chemical reactions, and bombardment by cosmic or radio-active radiations—that disturbs the normal rates of disintegration within the limits of experimental error (*i.e.*, within about 1 per cent.). The modern theory of the atom adequately accounts for this remarkable immunity." (The Physics of the Earth. IV, *The Age of the Earth.* Nat. Research Council, Washington, 1931, 155.) All the evidence so far accumulated

points to the inevitable conclusion that since life appeared on earth, immense ages have passed. Mr. Dewar quotes the most destructive evidence against Pre-Cambrian fossils he can find, and his authority is willing to admit three kinds, namely, burrows of worms, algal deposits, and Beltina. Now, in addition to these, I only add graphitic capsules which may be plant remains, and sponges. Without any examination of these or consideration of the inorganic evidences, Mr. Dewar rejects all Pre-Cambrian fossils, and, arguing that if the evolution theory be true the Pre-Cambrian seas must (why *must* ?) have swarmed with living things, and that rocks of that age should hold large numbers of fossils. He goes on to say that " three kinds of fossils is an impossible number " and " it is a case of many or none at all." In this statement Mr. Dewar shows how easy it is even for the non-evolutionist to theorise and not allow evidence to have full weight. Three kinds of fossils is not an impossible number, but just three kinds, and I would remind Mr. Dewar that *one* undoubted fossil would settle for ever the question of Pre-Cambrian life. Even if the Pre-Cambrian seas did swarm with life it is not at all surprising that very few evidences of it are available. The types of living creatures such as plants and worms and like soft-bodied animals would be fossilised extremely rarely, with very little chance of ever being found, for the actual outcrops of any bed are only a fraction of the total volume of rock, and outcrops of bare rock without vegetation rarer still. Mr. Dewar also says that " in common with almost every other Geologist " I " make the great mistake of believing that there is a necessary connection between the date of the first appearance of a group of organisms as fossils in the rocks known to us, and the date of the origin of the group in question." He denies, in spite of good evidence, that life existed in Pre-Cambrian times, and then, conveniently making the same mistake he accuses me of making, interprets this to mean that there was a sudden creative act in Cambrian times. He suggests also that as we know the life of Cambrian, Ordovician and Silurian times mainly by marine fossils there may have been a " rich land population during these periods." If this was so, how comes it that in Devonian times, in which Mr. Dewar recognises " a great and diversified land flora," there is not any evidence of this supposed rich fauna ? We know of extensive

land deposits of Pre-Cambrian, Devonian, Permian and Triassic times. It is not until Carboniferous times that amphibia appear, and true land reptiles arrive in the Permian and Trias. Mr. Dewar's last paragraph is, I hope, the result of hasty writing and not what he really means to say. His explanation why no new order of plants or animals has appeared since the beginning of the Oligocene period is striking, and is to the effect that " not until the Tertiary do we know any rocks laid down in elevated regions." First of all I do not know what Mr. Dewar means by " elevated " but the statement as it stands is not true. I have listed the periods in which extensive land deposits are known, and both the Torridon Sandstone, and much of the Old Red Sandstone was laid down in lakes surrounded by high mountains. Apart from the truth or otherwise of the statement, the logic of the argument is peculiar. In effect this is, that we do not find anything new appearing after a certain time because we know little about any previous time! Perhaps Mr. Dewar is suggesting that if we knew much more about pre-Tertiary land faunas we would find that many living things which we regard as Tertiary in age would be found to be really much older. I must say that there is sufficient evidence of the time sequence of the great groups throughout geological times to deny this suggestion emphatically. Further work may show that certain groups may have begun a little earlier in time, for example, good plant remains may yet be discovered earlier than Devonian, but enough is known to have established the general sequence. The statement, too, that once a group has appeared it suffers little or no modification is not borne out by facts, as a cursory study of the Ammonoidea, the Echinoidea and many other " groups " will show. Mr. Dewar does not define his term " group " but it must be fairly wide, because in his book *The Difficulties of the Evolution Theory*, pp. 106–108, he recognises the Tertiary fossil of Eohippus as a horse, saying, " Eohippus is as clearly a horse as the pouter is a pigeon," " although it is not much larger than a fox, it exhibits four toes on the front foot, and three on the hind, and its teeth are low-crowned, whereas those of the horse, to-day, are high-crowned," and he goes on to say " when more fossils are found it may be possible to construct a true pedigree of the various members of the horse family. We shall probably find that the family is composed of several genera,

each of which begins as a pentadactyl or tetradactyl horse and suffers the loss of the lateral toes as an adaptation to environment." The whole paragraph and especially the last clause is remarkable from one who, in his opening sentences in this discussion, hopes that I shall doubt that evolution has ever taken place, for he is evidently here suggesting slow adaptation to environment as a means of creation. This is very slow "creation" and is very like what I plead to be recognised. Mr. Dewar's position is not so very far from mine after all! He evidently can recognise the Eohippus-Horse sequence despite great differences in the two end forms, and great gaps in the fossil evidence.

I answer Col. Skinner's criticism as to science being unable to begin by accepting God as Creator, by quoting from Sir Ambrose Fleming's contribution to this discussion. "To gain truth in science we have to approach the task without any previous assumptions and allow facts to teach us." This is exactly the position taken by the Apostle Paul in Romans i, 20–22, referred to by Dr. Bell Dawson. Man must first of all study natural things about him, and then as a result he is expected to come to the conclusion that there is a God who is the Creator. The order is, first observations, then the conclusion; not the assumption before study, that God is the Creator. The conclusion is, nevertheless, not a scientific one, but a philosophic or a religious one.

Col. Skinner and others raise the point about whether man's body is included in the "image." I think that the arguments from the theophanies that Christ had a body in human form previous to the Incarnation is invalid, exceedingly dangerous, and really unscriptural We cannot argue, for example, from Luke iii, 22, that because the Holy Spirit descended "in a bodily shape like a dove" the Third Person of the Trinity always inhabits such a body. The anthropomorphic argument seems to take away much from the truth of the Incarnation, and the words in Hebrews x, 5, "A body has Thou *prepared* Me," lose point. The scripture quoted that "Christ is the visible representation of the invisible God" (Col. i, 15) must mean that Christ is the portrayal to men of the whole character of God. For men to understand this, the revelation must be made in terms of man's own life and environment, or be misunderstood. I would remind those who advocate these views of

Romans i, 22–23, which stresses the dangers of this anthropomorphic outlook :—" Professing themselves to be wise they became fools, and changed the glory of the uncorruptible God into an image made like unto corruptible man." The whole argument of Paul in Acts xvii, 22–31, is directed against these ideas of God. In Philippians ii, 7, it is definitely stated that He " took upon Him the form of a servant and was made in the likeness of men." This refers to the Incarnation. Col. Skinner suggests that my thesis is " playing for safety." I am not concerned with safety but with truth, and because there is a pagan philosophy of evolution we must not be afraid to change our ideas as to how the God in whom we believe has worked.

To Mr. L. E. Jose I would say that there is no absolute identity of form in any group of specimens from any one horizon. The group varies in any one character around a mean to which the majority of the specimens approximate, just as in the human species the average height is about five and a half feet, but there are also pygmies and some men above seven feet in height. At succeeding horizons in some groups of fossils the position of the mean for any one character is seen to change progressively and so the group changes as a whole in a definite direction. The group is heteromorphic in that it is a variable group but homogeneous in the fact that it is composed of a freely interbreeding community and that the members taken together form a group which varies regularly around a definite mean. I agree that the variation of such a homogeneous group in a definite direction points to some active principle which seems to work independent of competition between each member of the group.

Both Col. Davies and Mr. George Brewer raise the question of the " gap " theory which is based on the belief that a catastrophic judgment fell upon a primitive creation between the time represented by Gen. i, 1, and Gen. i, 2. I held this theory myself before I knew any geology and followed Schofield and Collett and the others. But the exact parallel between the fossil record and the written one leaves no doubt in my mind that they refer to the same series of events, and the view expressed in the Schofield Bible that we should " relegate fossils to the primitive creation (v. 1), and no conflict with the Genesis cosmogony remains " cannot hold.

Even if we allow the validity of the arguments for a catastrophic judgment before verse 2, I still maintain that the evidence goes to show that the fossils belong to the first chapter as a whole and that the days can only be periods of God's working.

Mr. Brewer again follows Schofield in suggesting that plants survived the catastrophe before verse 2, hence the command "let the earth bring forth." Again he says "in the commands for the earth and waters to bring forth that which was already in them." Does Mr. Brewer really mean that water animals as well as plants escaped the catastrophe? If such a command implies that life was dormant in earth and sea, what about verse 24, "let the earth bring forth the living creature" (no *bara*—create, is mentioned here)? As to the words "after his kind," would Mr. Brewer agree with Mr. Dewar that Eohippus was of the same "kind" as Equus? It is not necessary to believe that all living forms originated in one original cell of protoplasm. Berg's concept of many original forms of life is not unreasonable.

In reply to Col. Davies I would say that ignorance of the exact pedigree of any species of domesticated animal or cultivated plant does not destroy the evidence I give on p. 101 that the aspect of both fauna and flora in Tertiary times gradually assumes a modern aspect by the slow increase of present-day species. I agree that true lineages are practically impossible to decipher, but groups of anastomosing lineages are reasonably demonstrable. His illustration of a clause or two taken from a book is not good for his own argument, for even though it be divided into chapters, a book worthy of the name is a unified whole. The whole weakness of Col. Davies' attitude to my mind is that it seems to be based upon the belief that every fossil represents a specially created individual with unlimited capacity to migrate (to the confusion of palæontologists), coupled with complete sterility or a stubborn resolve to remain celibate, for the members of this school of thought seem to deny the very possibility that any fossils can ever be found that can be reasonably well shown to be related to an earlier group. It is obvious that for any one fossil specimen, its immediate ancestors may not have been fossilised, but it appears extremely likely from the fossil records that a good number of his "sisters and his cousins and his aunts" were.

I think that I have covered most of the important points raised in the discussion, and wish to thank all who have contributed, for it is only by open discussion that the truth can be hammered out and our ideas clarified. I would like to thank Dr. Curwen especially, for he exactly expresses my feelings as to the confusion which has arisen in some minds because facts have not been viewed apart from the anti-religious philosophy based upon them. I feel the time has come for a restatement of the evangelical position in the light of our present-day knowledge, and feel that the Victoria Institute is a proper place from which such a restatement could come.