EVOLUTIONARY DOGMATISM.

Professor Sir Arthur Keith's Address at the British Association, 1927.

Dogmatism has found for herself a new home. Under stress of much scientific scourging, she has left her old theological habitation and, *mirabile dictu*, has found a place in the sun amid the realms of Science. In one of his last addresses Lord Kelvin declared Evolution to be an hypothesis. "I marvel," he said, "at the undue haste with which teachers in our Universities and preachers in our pulpits are re-stating truth in the terms of Evolution, while Evolution itself remains an unproved hypothesis in the laboratories of science." What has happened since? Nothing to warrant the new evolutionary dogmatism. Yet on the lips of some of its advocates to-day it has passed through the stage of being a theory, and has become firmly established as an indisputable fact and law of life! Thus Dr. Barnes dogmatically affirms that Man has come "from a tangle of apes, somewhere in the Tertiary." An official Christian Apologist tells us that "The method of Creation is unquestionably that of Evolution"—unquestionably! And now Sir Arthur Keith declares "the fundamentals of Darwin's outline of Man's history remain unshaken." "Nature" (August 27th, 1927) reviewed Sir Arthur's address with much trumpeting of "the triumph of Darwin"—echoing Sir Arthur's "the victory of Darwin," "to make victory doubly certain," "Will Darwin's victory endure?" etc. "Darwin's position," says Sir Arthur again, "has become impregnable": and in keeping with this dogmatic trumpet-tone are such remarks as "the brain of Pithecanthropus, *as we now know*, had passed well beyond the anthropoid status." Victory! Triumph! Unquestionable, impregnable, position! We now know! Did the theologians—who are now, as Mr. G. H. Bonner truly says,[1] abandoning their Creeds so gaily—even in their most dogmatic days ever exceed this? Yet Sir Arthur's edition of *The Origin of Species* in "Everyman's Library" has the overmodest motto, "Hoc solum scio quod nihil scio." Evidently

[1] Mr. Bonner subjected Sir Arthur's Address to a searching logical criticism, which elicited little more in reply than a frank admission that the laws of thought need not be taken too seriously.

there are two Sir Arthurs, and the one who now confronts us is not the modest scientist but the over-confident dogmatic Anti-theist.

This dogmatism is a serious matter for those who have no knowledge of the real and hypothetical nature of evolutionary thinking. It is impressive and sadly misleading. Evolution is not a harmless ingredient of thought but a dangerous explosive. Darwin and Wallace knew this, says Sir Arthur: and he himself, and his followers, know it too. "There is no halfway house for the Church, once it adopts Evolution as its Creed," he declared in *The Sunday Times* of October 3rd, 1927: "It has to accept all or deny all." A month later (November 19th) *Nature*, in a leading article, signed by Rev. J. C. Hardwick, upon the correspondence which took place between Dr. Davidson and Dr. Barnes, said :—

> We have only to consider how integral to the traditional dogmatic system is the doctrine of an historical fall of Man. The Christian theory of human nature (that is, its need of supernatural grace, and so on) hangs upon it; while the scheme of redemption, involving an historical Incarnation, is its dogmatic correlative. It is not merely a question of the Earth having been created in six days or during incalculable periods of time—that issue, though it has been considered serious, is trifling, compared with the others raised by the theory of Evolution.

So Dr. H. D. A. Major, Principal of Ripon Hall for the training of Candidates for the Anglican Ministry, is reported as denying the depravity of human nature, the Virgin Birth, the Cross as Sacrifice for Sin, the Bodily Resurrection of our Lord, and His Bodily Second Coming, and saying that educated people base their hope of progress upon the Doctrine of Evolution: and Dr. Barnes says bluntly, in a Sermon at Westminster, September, 1927 :—

> Darwin's triumph has destroyed the whole theological scheme. . . . In fact, Man is not a being who has fallen from an ideal state of perfect innocence; he is an animal, slowly gaining spiritual understanding, and, with the gain, rising far above his distant ancestors. Further, it is quite impossible to harmonise this conclusion with the traditional theology of any branch of the Christian Church.

It is easy to jest about Evolution, but that belittles a gigantic issue. Evolution is a shattering explosive. Chiefly because of it the Christian Faith is losing its hold. It is not a toy to play with, but an edged tool. The loud dogmatism of the Evolutionist may be justly resented. The modest presentation of a working hypothesis for field and laboratory we could all appreciate: the claim that various phenomena meet with a sufficient explanation

in the evolutionary hypothesis, and that Evolution is a credible theory, we are all ready to consider calmly: but the shout of triumph, the baseless slogan "We now know!", the war-whoop and the tub-thumping about "impregnable positions," all this we are not ready to suffer; and, pleasant as the style of Sir Arthur's address generally is, it seems to argue a lack of sensitiveness when an eminent osteologist shouts so loudly and joyously that his party has destroyed the ground of our faith and the hope of our souls.

Sir Arthur, in the preface of his little book "Concerning Man's Origin,"[1] says, regarding his address at the British Association, "I could evoke no response from the sea of faces before me—only a stolid attention." Possibly the floor of the Association realised more clearly than the platform that the issues were too serious for such jubilance. Possibly, also, they realised that dogmatism about Darwinism was a little out of date in 1927. It is not easy for most minds to exclude in toto and perfectly all contrary views of the case. But that is where Sir Arthur triumphs. He admits nothing contrary to the views of his hero, and shows great dexterity in presenting even the failures of the evolutionary argument as reasons for accepting the impregnable Darwinism. For example: "In more recent years medical men have observed that characteristic alterations in the appearance and constitution of the human body can be produced by the action of other glands—the pituitary, thyroid, parathyroid, and adrenals." This is uttered, just in the course of Sir Arthur's argument *for*. Who would imagine the real fact, viz, that these words chronicle *the fall* of the old "vestigial argument," through the discovery of the use of the old supposedly useless "rudiments"? Or again, Sir Arthur dexterously argues: "Was Darwin right when he said that Man, under the action of *biological forces which can be observed and measured*, (the italics are mine) has been raised from a place among anthropoid apes to that which he now occupies? The answer is, Yes". The "Yes" is merely the expression of Sir Arthur's faith; and he omits to add that the biological forces have not yet even been observed! The address was short, and there was no time for anything but affirmation: but, if legitimate affirmations had been the only ones allowed, the address would have been very much shorter.

In this address Sir Arthur challenges attention both as a

[1] An enlargement of the thesis of his Address.

Scientist and as a Logician. In one or both capacities he takes this ground : that Man, physically and mentally, in his material and immaterial parts, is of one origin. In the little volume which enlarges upon his address, he protests against what he regards as the impossible position of the Modal or Theistic Evolutionists, who explain the material part by Evolution, and the immaterial by the creative inbreathing of God. There can be no doubt that in this he is right. The contrary view has no support either in the Bible or in reason ; and why Christian thinkers should assume the entirely unproven evolution of the human body is a great perplexity. But unity of origin has a two-fold importance both for Creationist and Evolutionist : for Evolution must in that case be proved in both departments of human nature, and failure in either department discredits the whole hypothesis. The Evolutionist, claiming Man's single origin, has not shown his hypothesis worthy of acceptance by proving, for example, the evolution of the backbone, unless he can demonstrate the evolution of the Moral Imperative as well. To parody a statement of Sir Arthur's : the Evolutionist, claiming Man's single origin, has no halfway house. He must demonstrate everything, or fail everywhere.

We look first, then, at Keith the Scientist ; and note that he pins his faith to Darwinism. He believed that his audience, if not convinced Darwinists, were yet " prepared to believe, when full proofs are forthcoming, that Man began his career as a humble primate animal, and has reached his present state by the action and reaction of biological forces which have been and are ever at work within his body and brain." " The fundamentals of Darwin's history (sic) remain unshaken." Sir Arthur does not specify in detail. All he says is that Man had an anthropoid origin : but this was not an original idea of Darwin's. Darwin's contributions were Natural Selection, Sexual Selection, and Pangenesis. How far are these ideas accepted to-day ? Take Natural Selection, which may be briefly outlined in such sentences as—Variations occur : these are heritable : some give victory in the struggle for existence : thus their fortunate possessors are able to hand them on to the succeeding generations. Is Natural Selection " victorious " ? Is its rock "impregnable " ?[1] Sir Arthur quotes Owen as dismissing Darwin in the

[1] That Prof. Keith intends to claim the detailed plan of Natural Selection to be "impregnable" is made clear in his edition of the " Origin," where he says that if the machinery of evolution described in the " Origin " were wrong the book would be out of date.

briefest of paragraphs, and at the same time citing passages from his own work to prove that the concept of Natural Selection as *an* evolutionary force was one which he had already recognised : and the fact is that posterity is affirming the correctness of Owen's estimate. The wide-spread opinion in the scientific world is well summed up in Sir Oliver Lodge's minimising words, " Natural Selection is a *vera causa* so far as it goes." But it only goes a little way ; and Prof. W. B. Scott expresses the wide-spread conclusion : " Natural Selection does not appear to offer an adequate explanation of the facts " (*The Theory of Evolution*, p. 25).

Sir Arthur is vastly wrong in thinking the scientific world is prepared to accept Darwinism. Nothing, in this connection, could be more informative than to contrast this address of his with the last great address of Bateson, before the American Association for the Advancement of Science, on " Evolutionary Faith and Modern Doubts," at Toronto, at the close of 1921. (*Science* : December 25th, 1921.) There is no greater name since Darwin : though he received far less attention than he had a claim to in his later years, because he offended the all-powerful evolutionary hierarchy. Darwin made the one impressive attempt to show how Evolution *might* have taken place. Frankly stated, his aim was to show " *What is conceivable*," and what we perhaps have a right to " *imagine*." So far was Bateson from being under the impression that Darwin's position is " impregnable " that, having in previous years affirmed that Darwin no longer speaks to us with philosophic authority, and that we have no facts, and that we have not even the right to formulate any theory about Evolution, he proceeded in 1921 to say that in " genetic circles " they had left off even talking about it. Forty years previously they had talked about Evolution ; but discussions came to an end primarily because no progress was being made and they now felt silence to be the safer course ! That is a vast distance from a readiness to accept Darwinism ! Bateson professed himself to be still an Evolutionist ; it was the only alternative to Creationism, which, alas, he frankly scorned. But his Evolutionism was a matter of faith only :—

> Where is the difficulty ? If the angiosperms came from the carboniferous flora, why may we not believe the old comfortable theory (i.e., of Evolution) in the old way ? Well, so we may, if by belief we mean faith—the foundation of things hoped for, the evidence of things not seen.

In his preface to Berg's *Nomogenesis*, Prof. D'Arcy Thompson says that when in 1884 he spoke to the British Association in Oxford on "Laws of Growth," the Chairman did not conceal his impatience. For the Chairman there were *no* difficulties in Darwinism in those days! "Since those days many things have happened, and Bateson has come—and, alas, has gone." If Bateson were here, a man unafraid of the evolutionary hierarchy and prone to speak plainly the truth that was in him, it would be vastly entertaining to have his opinion of Sir Arthur's address. For Sir Arthur is still very much in the happy position of the Chairman in 1884. Yet many others are still with us, whom Sir Arthur might have borne in mind. Dr. D. H. Scott is still here, and is a foremost authority on fossil botany. Space forbids me to quote him at length, but he has said (*Nature*, September 29th, 1921):—

> Not only is "the omnipotence of Natural Selection" gravely impugned, but also variation itself, the foundation on which the Darwinian Theory seemed to rest so securely, is now in question.

Dr. Scott even spoke of being back again in "pre-Darwinian chaos"; and I cannot forbear from quoting his tremendous words upon the absence of everything that can be called "evidence" in the realm of evolutionary change:—

> At present, all speculation on the nature of past changes is in the air; for variation itself is only an hypothesis, and we have to decide quite arbitrarily what kind of Variation we think may probably have occurred in the course of descent.

Moreover, if Sir Arthur forgot Dr. Scott he might have remembered Prof. D'Arcy Wentworth Thompson; for Sir Arthur is an anatomist and osteologist. The whole anatomical argument for Evolution is nothing more at all than a statement of likenesses, with *an assumption tacked on* that these likenesses can only be explained by the theory of blood-relationship and descent. But Prof. D'Arcy Thompson showed in his *On Growth and Form* (1916) that similar forces, playing on similar material, will produce resemblances; which do not necessarily argue descent but may be the outcome of the play of natural forces. Or Sir Arthur might have borne in mind the two latest contributions to attract attention in the realm of evolutionary thinking. Many of us realised with surprise that General the Right Hon. J. C. Smuts is not only an able soldier but that he has a brain capable of rare feats of abstract thinking

when his *Holism and Evolution* came into our hands. This is not the time to enter upon a consideration of Holism, which at first sight seems to be mainly a most able effort to present the observable facts of the grading of life upon this planet in the most abstract possible way. But whatever it is, or is not, it certainly is *not* Darwinism. The emergent Wholes of Holism are emergent and not resultant, and therein lies its closest affinity to Darwinism. For Darwin's "species" are "emergent," not "resultant". Hydrogen and Oxygen, combined by the electric current, form not a resultant mixture but an emergent water; and Darwin's new species are conceived by that philosopher as really new, and vitally differing from those that gave them birth, in other words as "emergent." So General Smuts' "Wholes" emerge and are different from the constituent parts whose broad interplay gives them birth. But Darwin saw the evolutionary movement taking place in the individual, and the movement of life proceeding in a million minute independent details at one time; and General Smuts sees the evolutionary movement taking place upon the broadest plain, where the individual is swept along in the unexplained development of "the field"—a vastly different conception from Darwin's.

Moreover, Sir Arthur might have remembered Prof. Berg's *Nomogenesis and Evolution*. It is of startling interest to find that, behind the terrible screen of Bolshevik Russia, scientific research is being pursued. How many minds must have turned eagerly away from the nightmare of communistic tyranny to the quiet fields of scientific observation and research! Dr. Berg is Chief of the Bureau of Applied Icthyology, and Professor of Geology in the State University of Leningrad. Prof. D'Arcy W. Thompson very fittingly introduces Dr. Berg to English readers: for *Nomogenesis*, without pretending to have fathomed the secret of the movement of life, decisively sweeps on one side Natural Selection, and finds the movement of life (as *Holism*, does) to be broad and general rather than individual, and covering the whole geographical landscape. Somehow, for example, the Gudgeon of the southern waters—South Russia, the Crimea, the Caucasus, Turkestan, North Italy—develop *en masse* a greater or lesser number of scales on the throat, and the body and caudal peduncle become deeper: whilst in the northern waters these features have *never* been

observed (p. 364ff). This "epidemical" character of the variation of species, the simultaneous *en masse* manifestation of new characters over a vast territory, is a matter of the greatest importance in the problem of Evolution, and bars out the concepts of Darwin. Berg finds that the geographical landscape appears directly to affect flora and fauna, according to a "principle of regulation" in nature. Useful variations plainly arise just where they are needful, just as a French lock is operated by a specially designed key; whereas Natural Selection operates accidentally upon useful variations (p. 37). Berg finds no doubt remaining that the organism is capable of acting efficiently, without having been trained thereto by previous individual or inherited experience (p. 43). As against Darwin, Prof. Berg quotes Zeiller (*Elèments de Palèobotanique*, p. 382): "Instead of transformation, little by little, the one into the other, they (the species) present to us in general a well-marked individuality, remaining unchanged during the whole course of their existence" etc.: Lotsy (in a series of works, 1912 to 1917), to the effect that all the diversity of the vegetable world is a result of combinations of a certain number of permanent, non-varying, primary elements; and Bateson (as also Davenport), who held that all the Evolution we know is an unpacking of an original complex, which contained within itself the whole range of diversity which living things present (p. 359ff).

Moreover, Dr. Berg declares: "To support the view that animals descended from four or five progenitors is now impossible. The number of primal ancestors must be computed in thousands or tens of thousands"; and in a Note he adds "Belogolovny (1911, p. 222) speaks even of 'millions of initial points'": and two concluding pages are occupied with two parallel columns displaying the essential errors of Darwinism. Berg's conclusion is that Selection is a factor *preserving* the standard and *limiting* variation; that Evolution is not a process of divergence of characters but of convergence; that great numbers of primitive organisms have developed on parallel lines, this convergence affecting the most essential features of the organism such as the skeleton, and the circulatory and nervous systems. Law is evidently at work, little as we understand it, and acts over broad fields of life. This all dissents from Darwinism practically everywhere. Much more might be said: but this is enough to reveal how far Sir Arthur's jubilance over "Darwin's triumph"

erred; and possibly such error was the reason why Sir Arthur could evoke no response from the sea of faces, but only a stolid attention.

But just one typical illustration of the difference between Darwin and those who disagree with him may well be given. Both Darwin and Dr. Berg quote the hive-bee, to show how the length of the proboscis is of importance. The contrast between the two is most instructive, and I have italicised certain words of Darwin's :—

> The tubes of the corolla of the common red and incarnate clovers do not, *on a hasty glance*, appear to differ in length. Yet the hive-bee can easily suck the nectar out of the incarnate clover but not out of the common red clover. . . . . Thus in a country where this kind of clover abounded *it might be* a great advantage to the hive-bee to have a slightly longer or differently constructed proboscis (*Origin*, p. 117).

Dr. Berg, on the other hand, quotes Khokhlov, who found that red clover can be profitably visited by bees with a proboscis not less than 6.70 mm. in length; that the Abkhaz bees have 61 per cent. of their number with such length of proboscis; whilst the Orel bees have no more than 1.3 per cent.; and Berg argues that more than half the hive must vary favourably at once, which means that variation is in a determined direction (pp. 369 and 370). The contrast between the two is simply that Darwin represents the theorists and Berg the careful observers.

I have space only for some brief glances at detailed features of Sir Arthur's scientific argument. He is a pragmatist, and finds assurance of the truth of Darwinism in the affirmation that *it works* in the realm of medical research and practice. This is an argument which he has been adducing for some years. It is true that in many essential anatomical features the primates are alike, and therefore the knowledge of the anatomy of the lower primates may well be of great service to the physician and surgeon. But this does not argue in any way whatever the derivation of Man from "a humble primate animal." The similarities are equally well explained by the doctrine of a Creation which embodied archetypal forms in flesh and blood, and the pragmatic argument might equally well credential the doctrine of Creation. Sir Arthur himself admits "If an ancient feature is reproduced, it is because it is a necessary part of the scaffolding for the new" (*Con. Man's Origin*, p.21). Exactly: the Great Designer moved from one form of Creation to another, "hut to palace" as it were, carrying through in large areas the same essentials of

design, repeating old features because they were necessary to the structure of the new form.

Sir Arthur urges the anatomical argument as his main "stand by"— and that argument is merely an enumeration of similarities between man and simian, with an erroneous assumption tacked on that they can only be explained by descent. They can equally well be explained on Creational grounds. They can equally well be explained by convergence, the same forces acting upon similar matter producing similarity of form. Thus Profs. Osborn and Wood-Jones believe that the stock of Man and the anthropoids parted company in the Miocene and have evolved independently into similar form. But another weakness of Prof. Keith's argument is that he minimises the differences between Man and ape. Anatomically an illustration of this will suffice. He quotes Prof. Elliott Smith[1] on the human and anthropoid brains, that no structure found in the brain of an ape is lacking in the brain of a human being, and that the human brain reveals no formation *of any sort* not present in the brain of a gorilla or chimpanzee. But Prof. H. E. Osborn, a very eminent evolutionist, wrote recently for *Palaeobiologica*, a Viennese scientific publication, and is quoted by *Nature*, 1925, p. 336, in these words :—

> While admitting some anatomical resemblances, he stresses differences of "behaviourism" between Man and ape, and thinks that "scientific mythology has accumulated around the anthropoid apes, falsifying and exaggerating their human resemblances, minimising and ignoring their profound differences from Man in habit and gait and in the anatomy and functions of the brain."

Prof. Osborn, that is to say, agrees with Prof. Virchow as to the vast differences in anatomy and brain between Man and ape, and both of them differ greatly from Profs. Keith and Smith.

But what about the differences between Man and ape upon the mental, moral and spiritual planes ? One of the distinctive features of mankind is the capacity for *abstract thought*, a capacity which lifts him to a plane beyond even animal comprehension. As for apes, while they have been known to follow man, and, when Man has left a camp fire burning, to warm their paws at the fire, no ape has ever been known to show intelligence enough even to put more wood on and keep the fire going. What *moral* gulfs

[1] Prof. Smith was responsible for the wondrous picture in the "Illustrated London News," June 1922, depicting Hesperopithecus and his wife : whereas the part of a molar tooth, which was Hesperopithecus, is now almost certainly adjudged to be the tooth of a peccary, Prosthenops. It was a daring evolutionary adventure, and recalls those daring political charges which earned another famous man the title of "Galloper Smith."

separate Man and ape? What glimmer of reason have we for assuming that the ape has any knowledge of the Moral Imperative? Or that he shares with Man the distinctive and wonderful gift of freedom? That feature of the human spirit, its freedom, inevitably lifts Humanity out of the coils of necessity, from which he never could have escaped had the evolutionary hypothesis been true. Man has a concept of the Great First Cause, the Creator God, and *a spiritual nature* which permits him to come into direct and conscious fellowship with God. The ape has none of this: nor has the evolutionary hypothesis revealed any path by which the gorilla might scale the heights of the spirit. Evolution only becomes a possible philosophy when we forget "What a piece of work is Man! How noble in reason! How infinite in faculty! In apprehension how like a God!"

> Think deeply then, O Man, how great thou art!
> Pay thyself homage with a trembling heart!

Sir Arthur appeals to Palaeontology, to vestigial organs, to blood-reaction tests, to embryology, and introduces some new "turns" with the fragments called "Pithecanthropus" and "Piltdown Man." Space forbids such a treatment of his arguments in these directions as they really deserve; but they cannot be passed by in entire silence. The blood-reaction tests have proved a very great deal too much, if indeed they prove anything at all; establishing relationships not only between Man and ape but relationships of the widest and most incomprehensible and impossible character. The appeal to Palaeontology does not meet with the desired response from the Palaeontologist. Dr. D. H. Scott, to cite only one, and that an eminent authority, has admitted the difficulty of finding "genetic series" of fossil plants, and has declared: "On the whole, one is impressed by the independence of the various phyla of vascular plants, all through the geological record" (*Extinct Plants and Problems of Evolution*, p. 202); that almost all flowering plants found in the geological record are with us here still to-day; and that we can only try arbitrarily to imagine what happened in ages gone by (*Nature*, September 29th, 1921).

So far as the vestigial argument is concerned—the "evolutionary postmarks"—Huxley's warning long ago that this was a dangerous argument, and involved *petitio principii*, has been borne out by continual discovery that the "useless" vestigial

organs are useful and often essential to the human organism. They are not "evolutionary postmarks," but part of the very fibre of the envelope itself.

But Pithecanthropus and Piltdown Man, singled out by Sir Arthur as his strong pieces, must be looked at closely for a few moments. Regarding Piltdown Man, we are fortunate in having some independent evidence of the character of the stratum in which these skull fragments were found. This independent evidence is of the greatest moment. Mr. G. W. Wilks went to view the gravel pit immediately after the discovery and before any change had been made by further digging, and has described from notes taken at the time what he found the position to be (*The Fundamentalist*, April, 1928). The stratum in which the fragments were found was between an upper band of about five feet of pure wealden gravel without flints and a lower band of the same unmixed wealden gravel, extending to and below the floor of the pit. The band containing the fragments ran round the pit, and was from twelve to eighteen inches thick where the fragments lay, *and had probably from five to ten per cent. of its bulk composed of flints.* Where did these flints come from? They can be explained only in one way; flints are not found near Piltdown, and can only have been brought by some mighty flood of waters, up the river Ouse, through the gap in the South Downs, from the sea. When, moreover, we find the eminent geologist, Prof. G. F. Wright, declaring that Black Head on the Brighton Sea-front, and many other deposits on both sides of the Channel, are rubble-drift from The Deluge, we have vast difficulty in recognising Piltdown Man as a semi-anthropoid ancestor from the misty geologic distances, and may probably see in him a brother man from days of terrible degeneracy just before the Flood.

As to Pithecanthropus, Sir Arthur's method of treating him is full of instruction, and reveals how easily ancestors and evidence may be manufactured by enterprising evolutionists. Pithecanthropus consists of a thigh-bone and, fifty feet away, a piece of a brain-pan and two teeth. "The thigh-bone might easily be that of modern man, the skull-cap that of an ape" (Keith). Whether thigh-bone and skull-cap belonged to the same animal, who can tell? If they did not we have in these fragments merely a man and an ape. But Prof. Keith assumes they belonged to the same animal, and draws the easy conclusion that Pithecanthropus shows

how one portion of the anthropoid body evolved man-wards more rapidly than another portion. In this case thigh-bones made quick progress, the skull-cap only slow. It is so clear that Sir Arthur's arguments really depend upon a prior unshakeable assumption of the truth of what he is supposed to be proving. We may fairly ask for something better than this. It is only one more illustration of the giddy evolutionary circle. The major premiss is "Evolution is true"; the minor is always "This is in accord with Evolution": and the dogmatic conclusion, labelled "a fact," is always "Therefore this is true." It is in this way Pithecanthropus arrives upon the scene.

A similar kind of argument characterises Sir Arthur's excursion into Embryology. The embryological argument is that in pre-natal months the human embryo passes through the stages of humanity's ancestral development. It "climbs up its own genealogical tree." The answer to the argument is that while in many stages the embryos of Man and beast appear to be much alike—as is inevitable upon Creational assumptions—yet we do not find much that we ought to find, and we do find features which on the evolutionary assumption have no right to be there. For instance, the cranial development of the unborn child is superior to that of the adult man. Similarly, the cranial development of the unborn anthropoid is superior to that of the adult anthropoid. Thus, if the embryological argument were sound, the course of development would not be "lower ape . . . higher ape . . . man . . . superman," but exactly the reverse, viz. "superman . . . man . . . higher ape . . . lower ape (the ape of to-day)." Prof. Keith will not frankly admit this. He even says "in anthropoid development we find no suggestion that a higher stage in development was ever reached." This is not in accord with facts; and even on the same page (*Concerning Man's Origin*, p. 22) he himself says that in scores of instances Prof. Bolk has shown that structural characters peculiar to Man appear as transient features in the unborn young of anthropoids. Prof. Keith's conclusion is that, while some embryological features are recapitulations of the past, some are prophecies of the future! "In the human foetus, if we could read the human horoscope aright, we might obtain the means for foretelling Man's possibilities in times to come" (p. 22 *ibid*). It is a delightfully simple solution of the problems of evolutionary embryology. Note the order of ideas,

viz: Evolution is true; we know this because the embryo recapitulates the past, and some essential anthropoid features appear in the human embryo; man therefore came from ape; but some essential *human* features appear in the *anthropoid* embryo; this must be because the embryo prophecies the future; for we know Evolution is true! Thus Evolution and Embryology prove each other. Roll thou my log and I will roll thee thine. Sir Arthur will have it both ways. He assumes the truth of his evolutionary hypothesis; calls his deductions therefrom "facts;" and then adduces them in proof of Evolution.[1]

If the British Association and the British public are prepared to accept this kind of thing from an eminent osteologist, they must be swinging fast along the down-grade. We ask for evidence. To be told what we shall believe "when full proofs are forthcoming" does not suffice. Prof. Keith calls Darwin's "evidence" "circumstantial," and says circumstantial evidence often figures in Courts of Law. But what terrible mistakes circumstantial evidence often leads to, Mr. Oscar Slater's name will recall; and evolutionary evidences are hardly worthy of the name at all. Keith frankly admits a series of mistakes in the past; he admits also that "the geological search . . . has not produced so far the final and conclusive evidence of Man's anthropoid origin. We have not found as yet the human imago emerging from its anthropoid encasement"; and all this should banish dogmatism in the present hour. We are not obscurantists in any sense; we are avid for facts; we shall raise our hats to them when we get them and live under their command. But the "facts" of Evolution are so doubtful and so peculiar—"a little glooming light much like a shade."

Prof. Keith also challenges our attention as a Logician. To him it is inconceivable that life as it is to-day has come into existence in any other way than as the result of the action and reaction of the forces inherent in nature, i.e., in the original simple organism and the forces of its environment. He rejects, as all the main evolutionary line rejects, the idea of the activity of God; naturally he rejects also the idea of the Soul; and to him the science of Genesis represents merely the state of ignorance which prevailed in eastern lands in the millenium prior to

[1] Prof. G. McCready Price has shown how the order of the strata of evolutionary geology was first determined by the fossils: and now the age of the fossils is determined by their position in the strata: vide "The New Geology" and other works.

Christ. Rejecting God, of necessity all Creational conceptions are excluded; and Sir Arthur appears to think that he has banished difficulties and mysteries, and explained the wonders of life. He rejects, of course, the argument from design. Paley and the Watch have only an antiquarian interest. The watch came stage after stage, and Keith thinks there never has been any need to posit a designer. The first stage was a small pocket clock invented in the fifteenth century; but surely not even the first invention came into existence without an inventor. Dr. Berg (*Nomogenesis*, p. 34) also chances to cite the case of the Watch—but how differently! "We might just as well expect that if the wheels, screws, and other component parts of the mechanism of a watch were put into a vessel, we could by the simple process of shaking get them to combine in such a manner as to become a watch which would function as such." There is the ring of sound old metal about this! The human mind affirms as clearly to-day as ever that design is impossible without a Designer.

How did this wondrous Universe of Means and Ends, where adaptation is ubiquitous, come into being? The answer "Evolution" is sound and nothing more. *How* does Evolution work? No one pretends to say. Mr. John Linnell, in *The Hibbert Journal*, October, 1928, says ignorance of the method does not matter. "The vast majority of us are equally ignorant of the working of a dynamo or an earthquake." But the vital difference is that we have endless illustrations that dynamos and earthquakes *do* work, but no single illustration of the transmutation of species. And Prof. Keith goes much further. We not only have no method, but we have no causation. We have design without a Designer. All design has been effected by "Natural Law."

It is most important to note the character of Sir Arthur Keith as a logician, that is, as a thinker. To him, "Nature" as an impersonal force is more credible than God. All design has been effected by natural forces. "God" is an assumption; but so, we answer, is the conception of design by natural forces. Moreover, there is no antecedent probability for Sir Arthur's assumption, but precisely the reverse. If any facts of design can really be explained by "natural forces," they can be explained with at least equal cogency by "God." It is not possible therefore to claim that Keith's assumption has any facts in its favour which cannot

be quoted on the other side with equal reason. Moreover, "God," as the explanation of design, is an explanation native to the human mind. It is impossible to move in the higher realms of abstract thought without positing the Designer to explain the design, the Moral Governor to explain the Moral Imperative, the Self-Existent to explain conditioned existence. Keith's assumption of design through Natural Law is a late assumption, reached with difficulty and in defiance of the reiterated affirmations of Reason, at the end of a long process of sophistication, with all the intuitions of the mind, the ultimate principles of human thinking, in fierce rebellion.

Prof. Keith indeed needs for the establishment of his Darwinism that we accept an hypothesis, without any proven support in fact, as a Law; that we be content to know nothing of any possible *method* of transmutation; and that we set at defiance the natural and essential laws of human thought. Keith indeed is in arms against the ultimate laws of thought. He thinks we can have liberty from the great law of Causation. Mr. G. H. Bonner has challenged him along such lines as these, and Sir Arthur had no answer except a frank avowal that he does not trouble himself about the Laws of Thought. For the evolutionist to fail here, and to find himself in rebellion against those ways of thinking which are innate and instinctive to the human reason, is just as fatal to his hypothesis as it is to be obliged to admit that the human imago has not yet been found emerging from its anthropoid encasement, or that Evolution necessitates the position that some facts of Embryology are recapitulations of the past and others are prophecies of the future. The necessities of the human mind cannot be trifled with just because it is "pretty Fanny's way."

Aristotle defined Causes as Material, Formal, Efficient, and Final. Suppose the case to be that of the Human Being—then the material cause is flesh and blood and so forth, the formal cause is the "idea," or "archetype," i.e., the shape and constitution of the type "Man"; the efficient cause is God; and the final cause is a Being fit for fellowship with God. The human Reason rejects inevitably the suggestion that the Efficient Cause can be dispensed with, just as it also rejects inevitably the suggestion that Man has come into existence without any Formal Cause, i.e., without any design in the mind of the Designer. The same argument applies, of course, in every realm of life; and when we

find that the various types of plants and animals appear upon this earth without any explanation of their form, and persist in that form until they disappear, how can the conclusion be resisted that Formal Causation was at work in each case, and an archetypal form embodied in material substance? Genesis ii. 5, as translated in the A.V., "And every plant of the field before it was in the earth, and every herb of the field before it grew," embodies the true archetypal thought. But Prof. Keith believes that wondrously adapted creatures need no Formal Cause; that they come into being without design; and of course equally without Designer; and if there is any meaning at all in such a statement as this, viz., *that there are wondrous forms of life without design, and without Designer*—if that is anything at all beside words—its meaning is a tenuous abstraction which is forever eluding thought. It is infinitely far removed from that robust Human Reason, which rules in all life's practical affairs, and ought to command the allegiance of a pragmatist like Prof. Keith.

Yet Sir Arthur has his substitutes, at all events for the Designer! "God" is too difficult a concept for him; but wondrous are the miracles of unbelief! Sir Arthur declares that "All life is purposive"; that living matter can both plan and execute; that unless matter is purposive, it cannot be alive. The thinker and the thought do not lie outside but inside living matter, and directing intelligence is of the essence of the constitution of matter![1] In place of the Personal God of Theism, Prof. Keith offers us purposiveness and directing intelligence as part of the constitution of matter! The change at all events cannot be said to be a simplification; nor does it diminish mystery but rather increases it; nor is it in keeping with the natural movements of human thought.

But Prof. Keith goes further. Both in his address and also in his exposition of it elsewhere, he asks our attention to the *osteoblasts*. A bone of the arm is broken, and he asks us to note the happenings in the wondrous factory of the arm, where myriads of microscopic workmen (the osteoblasts) get to work at once to repair the breakage. No osteoblast has ever been trained, no plans or patterns are supplied, each has the needed design in its own knowledge, its skill is perfect, its knowledge of its own place

[1] Dr. Fleming asked Prof. Keith: "If living matter itself is the intelligence which shapes itself, then where did the guiding intelligence reside when there was no living matter, the temperature of the globe being too high to allow protopelism to exist?" but he naturally received no reply.

and power is innate! Each of these wondrous little things is presented as a Self-Existent Intelligence, with a skill we men can never aspire to, and a knowledge of osteology so far transcending Sir Arthur's own as to be nothing short of divine. The Great Deity, the idea of Whom is native to the human mind, is banished; but in His place we have unnumbered myriads of little deities called osteoblasts, who do the Great Deity's work to Sir Arthur's satisfaction. Great are the miracles of unbelief, and great are the demands of the evolutionist!

Prof. Keith declares the design and the Designer to be the same, in sheer defiance of the laws of thought. His words are all to be found in the dictionary, but whatever do his sentences mean? He looks on from outside and cannot see the Designer. He can watch the osteoblasts under the microscope; but the microscope does not enable him to see God. Therefore he says that God is not there. But must we not be guided by the only realm we know? There is indeed only one realm really known to us, the realm of human life, and there certain essential things can be seen. There, in that realm, the distinction between design and Designer is perfectly plain, and the one is as essential as the other; and when Prof. Keith says there is no duality of function in living matter (*Nineteenth Century*, 1928, p. 230), or in other words that there is no Designer in the Universe, he contradicts the most certain verdict of intelligence in the only realm *which we know*. Pope's lines seem peculiarly applicable to him, as an answer to his impossible argument:—

> All Nature is but Art, unknown to thee:
> All Chance, *Direction which thou canst not see.*

Scientifically, we conclude, Evolution remains a mere hypothesis. If, as Darwin hoped, it provides a stimulus to research, well and good. May it continue to do so; but before it attains the dignity even of a theory it must have some facts upon its side. A theory is an hypothesis which has been well buttressed about with facts, whereas Evolution still floats merely on the breath of bold speculation. It has no more plausible advocate than Sir Arthur Keith; but the reason he harks back to the long-discredited Darwinian methods of Natural Selection, etc., is simply that no one has ever found Evolution at work, and no one has ever therefore been able to prove anything about the methods of the assumed transmutation. To buttress up the hypothesis, as he conceives it, Prof. Keith is obliged both to resort to most

peculiar methods of argument and to defy the elemental laws of thought. Viewed scientifically, it cannot be too strongly affirmed that Evolution is a matter of evidence, first, last, and all the time. Viewed philosophically, it cannot expect to be treated with respect unless in its turn it treats with respect the elemental laws of human thinking.

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