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ARTICLE VIII.

CRITICAL NOTES.

I.

THE THEOLOGICAL AND SCIENTIFIC THEORIES OF THE ORIGIN OF MAN.

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THE question of the origin of man has been so long under discussion that it is now possible to get a fair view of the comparative merits of the opposing theories of his creation. The charge that the theory of man's physical relationship with the other primates is a reversion to the old savage belief in the brotherhood of men and beasts may be set aside now as having lost its force. When the theory first appeared, theology was already in the field with others concerning the age of the race, the method of its creation, and its original home. But while the scientific theory was opposed by the whole Christian world because of the belief that the Bible teaches a contrary doctrine, the negative evidence opposed to it, and the positive evidence in favor of it, have made their proper impressions; and the value of the latter has come to depend not only on its amount, but in a marked degree on its nature. Meanwhile, the supposed evidence in favor of the opposing theories has been tried and found wanting.

Reiteration and association with sacred things often gives error the force of sacred truth. A remarkable example of this tendency is Usher's chronology of the Bible. It is still quoted as final in the Sunday-schools, and is sometimes, even yet, made the basis of attack on scientific theory. But scholars are agreed in nothing with reference to it so much as they are in the opinion that it is far from perfect. Many years ago Adam Clarke made the pathetic confession that he ultimately fixed on the commonly received chronology because it seemed to be the least objectionable. More recently Lange made the remarkable confession that "the first imperfection [of biblical chronology] is the want of an unbroken series of dates by years, starting from some fixed point in history. The second is the absence of a reference of the dates in the history of Israel, to the contemporary dates of general history."

In like manner, the Duke of Argyll, commenting on the great diversity of

the Old Testament texts and chronologies, says that no confidence can be felt in any of the results. Professor Charles Hodge also declared that "the Scriptures do not teach us how long men have existed on the earth." And recently Professor William H. Green, after a thorough discussion of the Old Testament genealogies, concludes that "the Scriptures furnish no data for a chronological computation prior to the life of Abraham." In the face of these admissions it is, to say the least, a misfortune that Bible houses and tract societies should continue to print Usher's chronology in the Bible margin. Nor is it a good excuse for the retention of what is not correct to say that it is the best there is. The first step toward the truth is taken by the removal of error.

While it is becoming more and more plain that the Bible cannot be used as the foundation of a discussion of the age of the human race, the same is true of the method of his creation. What the Bible says about the origin of man is very brief and apparently very plain: "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 formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul. And the Lord God caused a deep sleep to fall upon Adam, and he slept; and he took one of his ribs, and closed up the flesh instead thereof. And the rib, which the Lord God had taken from man, made he a woman and brought her unto the man." The body of man being a visible thing, its creation must have been a visible process; especially because, according to the record, it was made, not out of newly created material, but out of what was already in existence, "the dust of the ground." The hypothesis that the Creator was present in a visible form, collecting his material, fashioning the trunk and limbs, boring the arteries, spinning and planting the hair, and in the end admiring his own work, lies under the ban of vulgar anthropomorphism, and would be rejected by intelligent theists as the work of an impious imagination. Only two other hypotheses are left. Either the inorganic materials of the body flew together, or slowly slid together into the human form. These are the only possible conceptions apart from the theory that man is derived from another mammal. It would be a great step forward in the discussion, if theologians would point out the superiority of any one of them.

In the long and bitter struggle against the theory of descent, the only point of agreement has been that "man was specially created." But no amount of reflection can discover anything whatever in the biblical narrative concerning the method of man's creation. At only one point in the narrative is there anything specific as to method, and that is in the story of the creation of the woman. It is plainly stated that the Lord took a rib out of Adam's side and made a woman out of it. But what little is said about the biblical story of man's creation, in the anthropological discussions of systematic theologians, leaves the impression that the description of Eve's creation must be regarded as figurative. Tayler Lewis spoke of it as "that mysterious sleep of humanity [was it long or short?] in which, by a process most concisely symbolized,

but utterly ineffable in respect to the manner, the female human is brought out as the closing work, and man awakes complete in the likeness of God." It the same strain Dr. McCosh says, "If any one ask me, if I believe man's body to have come from a brute, I answer, that I know not. . . . . Neither [science or revelation] has revealed this to me;" while Dr. Strong admits, that "the Scriptures do not disclose the method of man's creation," and that whether man's physical system is or is not derived, by natural descent, from the lower animals, the record of creation does not inform us." It would seem, therefore, that the way were clear for the dispassionate consideration of scientific evidence upon the point.

Concerning the original home of the race, the record in the second chapter of Genesis is so simple, and the geographical references are so clear, that it would seem that there ought never to have been any question as to where the garden of Eden was. But all the continents of the globe have been searched in vain for the site. Among the theories two are still especially prominent and divide between them the respect of those who believe that the location of the garden is known. One is that it lay in the highlands of Armenia, and the other that it extended from the Nile to the Ganges. The latter makes the garden several thousand miles long. If the same "latitude" were allowed to the president of Boston University, he could safely locate one end of the garden within the Arctic circle and in the other end include the Euphrates River. But his theory loses the caste that belongs to the others because it undertakes to build on the facts of science. The chief value of his argument is that it enforces the already patent fact that from the biblical teaching little is known of the early home of man.

We may conclude, therefore, that the Bible furnishes neither information nor materials for reliable theories concerning the age of the human race, the method of man's creation, or the place where he first appeared on the earth.

The scientific evidence relating to the age of man is inseparably connected with the glacial period. Geological belief concerning the length of time that has elapsed since the close of that period has undergone a change. The later stages of the ice period are put, by the most moderate, at about seven thousand years ago; and the first reliable evidence of man's presence on the borders of the ice, "on the least calculation, a number of thousand years" earlier. The nature of this evidence is such as to lead to the inference, if any is to be drawn at all, that man was then already widely scattered over the earth, and present on both hemispheres; so that, besides twelve or fifteen thousand years that are fixed by the most moderate estimates based on direct evidence, there must be added the indefinite period beyond, for which there is no evidence. And this is altogether apart from the evidence that has been offered to prove man's preglacial existence, which is slowly increasing in amount and gaining hold of the scientific mind. The age of the human race is not known, and probably never will be known with any great degree of accuracy.

Science cannot even furnish material for valuable conjecture as to the

original home of the race. The latest expression of one of the highest authorities in anthropology is that it is well that speculation concerning the cradle of the Aryans is rife, but that it must be remembered that it is only speculation. The history of this division of the human family is better known than that of any other. And while its early history remains hidden in impenetrable darkness, there can be no hope of locating the home of primitive man. This is one of the problems of the future; and many of the principal factors for its solution have yet to be resolved, before the main problem can be successfully attacked.

Science, however, does have a theory of the method of man's advent on the earth, which is that man has descended by the ordinary process of animal birth from a lower form of life. But it is plain, from what has already been said, that it derives no support from the geographical distribution of man. This department of biology, which furnishes such rich materials for the study of the history of many of the lower animals, fails in the case of man, for the reason that he is cosmopolitan and migratory. Where the same thing is true of lower forms, geographical distribution fails in a similar way to shed any light on their history.

The most powerful physical argument against this theory is the fact that no connecting links between man and the apes have been pointed out among living or fossil forms; and the conclusion has been that, "until this is done, the view that man's physical system is descended by natural generation from some ancestral simian form can be regarded only as an unproved hypothesis." So far as connecting links are concerned, there not only are none, but science is at a loss to know where to look for them, and is likely to remain so until the coveted fossil is found by accident.

The general criticism to be made against the opposition based on this fact is that it rests on negative evidence which will lose its value in the presence of evidence of a positive nature. But not only has there been a determined effort to keep this gap in the foreground of the discussion, as the one item on which the value of the whole theory must rest, but no pains has been spared to make the gap as wide as possible. Still, gaps wider than this in the animal series have been filled, so that the fact that no links have been found does not prove that there are none. It would have been a great gain in the discussion if careful attention had been given to the nature of the evidence, as well as to the evidence itself; for not only the width of the gap, but also its nature, has played a prominent part in the discussion.

The result of a generation of discussion may be given in a few words. The principal differences between man and the anthropoid apes are: (1) the greater size of the brain and brain case in man; (2) less development of the canine teeth in the males; (3) the relatively greater strength of the lower limbs; (4) adaptation of the vertrebral column to an erect posture; and (5) differences in the great toe. After all possible allowance has been made for the cerebral differences between man and the apes, they are only differences of proportion, and not of structure. "As if to demonstrate, by a striking

example, the impossibility of erecting any cerebral barrier between man and the apes, Nature has provided us, ... so far as our present knowledge extends, with . . . . . one true structural break in the series of forms of simian brains. . . . . This hiatus does not lie between man and the manlike apes, but between the lower and the lowest simians, ... the monkeys and the lemurs." To let a great zoologist speak, "Efforts have been vainly made to show that certain parts which are always present in apes and other animals, are absent in man; and the attempts to prove the converse of this, viz. that there are parts of fundamental value in the human organism which are found in no other animal, have as completely failed." Claus enforces this statement with another, if possible still more significant, "Far more important [than the differences between the heads] are the differences between the limbs of man and those of the anthropoid apes." And in this opinion zoologists agree with him.

Among the positive evidences in favor of the theory of descent, the first that lend presumption in favor of the theory is the marked varieties of the human race. Many good zoologists decline to decide whether the human race consists of one or several species, "since, from the impossibility of drawing a distinct line between species and race, a definite conclusion is impossible." This opinion was enforced by the authority of Louis Agassiz, who was most emphatic in the opinion that mutual sterility as a test of specific distinctness and mutual fertility as a test of specific unity are utterly worthless. But neglecting the question, whether or not the varietal differences justify the separation of the race into several species, they remain to be accounted for. They extend to all parts of the body, and their importance rests on the fact that an appeal to degeneration does not account for them. The retreating forehead and chin, the prominent jaws, almost bridgeless nose, and relatively longer arms of the Negro are indisputably apelike characters, when the higher human races are taken as the standard of comparison. Nothing but the theory of descent will account for the direction in which the varietal differences point, even were it granted that they are the result of degeneration.

The individual variations among human muscles and other organs are both great and numerous, and acquire their greatest significance from the fact that a large part of them are apelike variations. Mr. J. Wood observed in a single male subject "no fewer than seven muscular variations, all of which plainly represented muscles proper to various kinds of apes." The testimony of rudimentary structures in the human body is to the same effect, and is, if possible, still more forcible and altogether unaccountable on any theory of special creation.

In every stage of its developmental history, the human body gives evidence of its relationship to the lower animals. All the facts of embryology are eloquent in behalf of the theory of descent, for the simple reason that under it they find a perfect explanation, and without it are a chaotic mass of unaccountable facts. The evidence is based on a principle that no one denies: the inheritance of physical characters. If man was especially created,

no matter how much like the apes the structure of his body, his development ought to be direct from the egg to the mature form. But throughout its progress it passes through stages represented by the lower forms of vertebrates. The force of the evidence that is not only stamped on every organ of man's body at maturity, but written in unmistakable changes that take place at every moment of his early history, can be escaped only by ruling out the principle of inheritance. If this principle is admitted (and the evidence of embryology can be considered under no other) the evidence for descent becomes overwhelming, and the negative evidence opposed to it loses what little value it ever had. To quote Wallace, "in that case [special creation] the rudimentary structures, the animal-like variations, the identical course of development, and all the other animal characteristics he possesses are deceptive, and inevitably lead us, as thinking beings making use of the reason which is our noblest and most distinctive feature, into gross error. . . . . And as we seek in vain, in our physical structure and the course of its development, for any indication of an origin independent of the rest of the animal world, we are compelled to reject the idea of "special creation" for man as being entirely unsupported by facts, as well as in the highest degree improbable."

When so large a group of facts as that of embryology suggests the theory of descent; when in the extremely intricate group of phenomena nothing is found to contradict the theory; when the theory accounts for, and forms a science out of an otherwise chaotic mass of unexplainable facts, reason requires that it be accepted to the exclusion of every other. When a theory not only does this; when it gives all the clues to farther investigation; and the lines of research suggested by it prove to be the paths along which nature has preceded the student, and are the only lines along which progress can be made, all of which is done for embryology by the theory of descent, it loses the character of a "provisional hypothesis." It becomes an established part of the general theory of things, for it has fulfilled the philosophical requirements of a true theory.

There is only one thing more that a scientific or any other theory can do: it may so clearly point out the direction in which the richest rewards of research lie, as to enable investigators to make direct predictions concerning the presence of things that have never yet been seen by human eye. The theory of descent required that one or more pairs of abdominal ribs and the os centrale, which is absent from the adult human wrist as an independent bone, should be normally present at an early stage in the development of the human embryo. Their presence was predicted, search for them was made, and rewarded with success. In astronomy and physics some remarkable predictions have been made and fulfilled, and not the least remarkable feature of those predictions has been their accuracy. But that accuracy has depended on the fact that the predictions rested on a mathematical basis. It is a notorious fact, however, that the biological sciences do not rest on a mathematical foundation, but are subject to the uncertain complexity of historical rather than the simplicity of mathematical laws. Rosenberg, by his discovery of the

os centrale, proved that the theory of human descent is on a level with those of astronomy and physics, even in the power of prediction. When expectation rises into prevision so clear that such predictions can be made, nothing more can be added to any theory. It has approached as near demonstration as is possible outside of pure mathematics. Well might Wiedersheim declare, that the demonstration of the presence of "the os centrale in the carpus of the human embryo is one of the greatest triumphs that Morphology, based on the theory of descent, has won during the last decades."

The whole question of the descent of man has been burdened by its connection with two others: whether the soul of man is involved in the descent, and whether natural selection is the working force that has brought about the change. It would be in the interest, both of truth and of logic, to have these questions kept separate, and careful consideration given to the nature as well as to the amount of evidence in favor of the theory that man is related by birth to the mammals nearest him in structure. It would be conducive to a right understanding of the subject to compare the nature of this evidence with the nature of the evidence for any other theory, scientific or theological. And, finally, it would be very desirable to have some master consider together, from a theological standpoint, the theory of the descent of the human race, the theory of special creation, and the theistic belief in divine immanence; in order to disclose, if possible, the atheism involved in the first, the necessity of so-called creative interference that lies at the basis of the second, and the relation of the third to the general theological opposition to the theory of descent; and in order to drive out such heterodox assertions as that which declares that "we must supplement natural selection . . . . . with the doctrine of an originating and superintending God." For if God is immanent in all things how can we need to speak of his supplementing anything?

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