

thereon. He had not thought it necessary to pursue the comparison further than the investigation of the Greenlander or Esquimaux skulls in the collection of the Royal College of Surgeons, and in the British Museum. He there found several instances in which the premaxillary palatine suture was distinctly closed in the skulls of Greenlanders, and on referring to his own note books, he found that similar instances were sometimes present in other races than the Esquimaux. His friend, the late Camille Bertrand, whose loss to anthropology he had personally to deplore, as well as the society at large, had accumulated many facts on this subject. He might further refer to Rousseau's valuable memoir, "De la non-existence de l'os intermaxillaire chez l'homme à l'état normal, et des erreurs commises à l'égard de la prétendue existence de cet os." Prof. Carus had not stated whether the fissure he alluded to was present on the outer or inner side of the maxillary bone. If the former, of course such an abnormality was almost unprecedented in the human adult; but if the latter not uncommon defect of ossification was all that Prof. Carus alluded to, Mr. Blake had much pleasure in reading the following passage from the work of his friend Dr. Webb, on *The Teeth in Man and the Anthropoid Apes*. "We may, however, remark here, that although the premaxillary palatine suture is usually entirely obliterated at a very early period in the human *cranium*, traces of its existence are occasionally found both in adult European skulls and in those of the dark races. A careful examination of the collection of *crania* in the Museum of the Royal College of Surgeons will satisfy the inquirer on this point. In the skull of the human idiot figured in the first volume of the *Zoological Transactions*, the same condition is represented, and its occasional occurrence has not only been noticed by Lawrence and other modern writers, but it was especially remarked by some of the older anatomists. In Vesalius's great work, *De Humani Corporis Fabrica*, edit. 1555, is an engraving of a skull exemplifying this peculiarity. Let it be, however, distinctly understood that in such exceptional cases the suture has never been found to extend through the *alveolus*. Galen, as Vesalius infers, debarred the practical study of human anatomy, and, restricted to the dissection of the lower animals, was led into the error of reckoning an intermaxillary amongst the separable bones in Man." The character in question was neither common to all Esquimaux skulls, and it was to be found in other races of man.

The thanks of the Society having been given to Dr. Carus and Mr. Blake: the following paper was then read.

*On Anthropological Desiderata, considered with reference to the various Theories of Man's Origin and existing Condition, Savage and Civilised.* By JAMES REDDIE, F.A.S.L., Hon. Mem. Dial. Soc., Edinburgh University.

SIR,—One of the first questions raised in this Society was, whether there were not already sufficient facts collected, from which it would be our duty to deduce general laws; or if the collecting of additional facts was not a primary duty? But, whether there be sufficient data



yet, in the very same volume in which Sir Charles Lyell acknowledges his long-lived rejection of facts bearing upon the antiquity of man, he becomes the ardent advocate of a new and startling theory, which strikes at the root of, and supersedes, all other theories and traditions of man's origin and history; and he recommends it to be accepted, as "at least a good working hypothesis", upon the sole ground that the geological record—which at present contradicts it—is "so very imperfect"! He seems also to think, that all that is now necessary, in order to secure its acceptance, so far as anthropology is concerned, is the discovery of the fossil remains of some animal intermediate in form between that of the ape and man. He even tells us precisely where the search must be made for this last of the apes or first of mankind—namely, in equatorial regions. And should there, by some fortuitous chance, hereafter be found buried in Africa, the skull of a Negro idiot, or of some African female of the lowest type, with an abnormal cranium somewhat more flattened than usual, enlightened and civilised man is then expected to believe, not only that his first human progenitor was a Negro, but that the Negro Adam and Eve were the progeny of apes! Certainly, if men can be brought to believe in the latter deduction, they can scarcely hesitate as to the former; though, before they can accept it, they must unlearn all the facts they now know—and which were recently so ably laid before this Society\*—relating to the Negro character and history. According to the transmutation theory, adopted by Sir Charles Lyell, man becomes merely the last link in one so-called "natural" chain of being; anthropology would then be apparently reduced from one of the most difficult and complicated of human studies, to a simple fraction of one common science of organic life; and "Anthropological Desiderata" would dwindle down to the attainment of one solitary object—the discovery of a semi-human skull!

A hypothesis so sweeping and comprehensive as this, claims the especial attention of anthropologists. It is either a very great truth or an astounding error. If true, it disposes summarily of the most important anthropological hypotheses. It gets rid, of course, of the polygenous theory, by assigning to us the ape for an ancestor, mediately through the Negro. But it not only settles the question of man's origin from one or many Adams; but it also determines that the primitive man was a savage, or something even lower. And it must surely be admitted to be absurd, that anthropologists should go on discussing whether the primitive human pair or pairs were savage or civilised, if there is really any ground for believing in the probability that our immediate progenitors were baboons.

The scope of this paper does not admit of a critical examination of the whole grounds upon which the theory of transmutation is now put forward by Mr. Darwin. It is enough to say that, although it is enunciated in a volume of 500 pages, its author does not claim in that volume to have as yet adduced facts sufficient even to establish the

\* On the Negro's Place in Nature. By Dr. James Hunt, Pres. A.S.L., etc. Trübner and Co.: 1863.

minor hypothesis "of the origin of species by means of natural selection"; though he has nevertheless not only arrived at that conclusion himself, but goes very far beyond it, to believe that, as species may have been derived from mere varieties, so genera may have been developed from species, and even animal from vegetable life, and man from the inferior animals. Moreover, he is of opinion (as expressed in the concluding words of his volume) that "there is grandeur in this view of life with its several powers, having been originally breathed by the Creator into a few forms, or *into one*; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, *and are being*, evolved."\*

The chief and only positive argument in favour of the theory of transmutation on which he insists, however, is its *naturalism*, as opposed to what he characterises as "the miraculous system of distinct creations". The only weak point in the theory of which he appears to be conscious, is the want of palæontological facts to support it; and this he asks us to disregard, on the ground of the present great imperfection of the geological record.

Sir Charles Lyell adopts both these arguments, and, after pointing to the numerous recent corrections become necessary in the theories of palæontologists, which had been founded on the geological record when still more imperfect than now, he frankly acknowledges "that no one can believe in transmutation, who is not profoundly convinced that all we yet know of palæontology is as nothing compared to what we have yet to learn."†

Professor Huxley, as a physiologist, has also adopted the theory, and advocates it popularly, while admitting that, as yet, the physiological facts are contrary even to the limited proposition indicated by the title of Mr. Darwin's book. The professor allows that, "in addition to their structural distinctions, the species of animals and plants, or at least a great number of them" [he might rather have said all, almost without exception], "exhibit physiological characters—what are known as distinct species, structurally, being for the most part either altogether incompetent to breed with one another; or, if they breed, the resulting mule or hybrid is unable to perpetuate its race with another hybrid of the same kind." And yet he gives in his adherence to Mr. Darwin's theory in these words: "I, for one, am fully convinced that, if not precisely true, that hypothesis is as near an approximation to the truth as, for example, the Copernican hypothesis was to the true theory of the planetary motions"; adding, "if man be separated by no greater structural barrier from the brutes than they are from one another, then it seems to follow, that *if* any process of physical causation can be discovered, by which the genera and families of ordinary animals have been produced, that process of causation is amply sufficient to account for the origin of man"; then, "man might have originated by the gradual modification of a man-

\* Darwin, *Origin of Species*, p. 525.

† Lyell, *Antiquity of Man*, p. 406.

like ape; or as a ramification of the same primitive stock as these apes." The "ifs" in these remarks are most important; but they do not stand in the way of Mr. Huxley's accepting the full conclusion of the proposition with all the ifs eliminated. He sweeps aside the inductive facts which are contrary, and to which he has himself previously testified, and, thus moralising, assumes the whole question at issue in these words: "Thoughtful men, once escaped from the blinding influences of traditional prejudice, will find *in the lowly stock whence man has sprung*, the best evidence of the splendour of his capacities." He also considers that, in his little book on *Man's Place in Nature*, he has set forth "the chief facts upon which *all* conclusions relating to the nature and extent of the bonds which connect man with the brute world *must* be based"!

We thus see how entirely the desiderata of this science depend upon the hypothesis which may be adopted, and which requires to be established. To establish the theory of transmutation, however, there is more to be disproved than to be discovered; and unless it can be imagined that the physiological facts acknowledged by Professor Huxley can be blotted out, it will become the duty of a Society such as this, not merely not to accept the theory of transmutation, but positively to reject it as totally unfit to be tolerated as a "working hypothesis."

I have certainly understood that anthropology claims to be established as a natural and inductive science. If so, the absence of positive proof\* is itself a sufficient reason for not accepting any theory affecting it; but still more are we bound not only to reject, but to condemn a hypothesis which its very adherents admit could only be established by a *reversal* of the laws of nature. Not only does Professor Huxley explicitly admit that the physiological laws of hybridity are against it; but its author—no, not its author (for it is but the theory of Lamarck, Monboddo, and of the anonymous writer of the *Vestiges of Creation*, once more furbished up, and attempted to be established on totally different grounds than before), but its present regenerator—tacitly admits the same thing, in appealing to the geological record *in posse*, in order, as it were, to contradict the *de facto* record, and also to negative all the experience of mankind within the whole historical period, as to the breeding, intercrossing, hybridity, prolificacy or sterility of animals.

And yet this theory claims to be especially *natural*! What spite, then, can nature have had against its own laws, that the geological record should have been left thus imperfect at the very points which are supposed to be most important to prove their "constant mode of operation?" And in what unfortunate circumstances is man not placed in the world, if, notwithstanding his now supposed great antiquity of existence, there is not the slightest trace of a tradition, as well as not a single actual instance before our eyes, or within man's experience, of the operation of that law of life and development

\* *i.e.*, positive proof of at least some facts in nature in accordance with, or analogous to, the class of facts which are assumed to have existed, *ex hypothesi*.

which claims our adherence on account of its constancy and freedom from a miraculous character? Surely, if there were nothing miraculous in the continuance of such a law of constant transmutations for millions of generations and ages, till it has produced all the forms we now behold in the world, its extraordinary cessation now, and within the whole historical period of man's existence, approaches the miraculous!

But a prior question might be raised. Professor Huxley has very properly observed, that the very first requirement of a hypothesis is that it should be intelligible. But none of the advocates of the theory of transmutation give us the slightest hint how to get over a physiological difficulty affecting its very conception, and which will always be a puzzle, at least when we ascend to the later developments of animal life—to the first mammals and to man. We can understand, in a measure, perhaps, at least as a proposition, how geese came to stretch their necks till they turned into swans; though, if that is the origin of the swan, we may wonder why geese do not ever become swans now, and are apt to forget the value of the "scientific" explanation, which is literally (according to Mr. Darwin) because the geese are now more confirmed in their character! We can even understand how monkeys might have rubbed off their tails by sitting upon them, though we cannot get a single step further in the "natural" transmutation of the ape into a man. But those arguments (if we concede them to be such) are rather furnished to us by Lamarck, though Mr. Darwin has adopted them; and we are totally at a loss how to apply them to the case of a fungus progressing towards a higher state of vegetable existence.\*

But, shutting our eyes altogether to such difficulties, we cannot but feel curious, as men, to know how possibly the first mammal was nourished in its "struggle for existence", if its immediate progenitor was not a mammal. Or, again passing even over that, and contemplating "the lowly stock whence man has sprung," according to the theory, and as Professor Huxley expresses himself, to the physiological difficulty there is added one that is psychological; for even

\* As regards vegetable life Mr. Darwin dwells almost exclusively upon his "Law of Natural Selection" to account for modifications. But when he comes to speak of animals he recognises that "the external conditions of life, as climate, food, etc., seem to have induced some slight modifications." He also says that "*habit*, in producing constitutional differences, and *use* in strengthening and *disuse* in weakening and diminishing organs, seem to have been more potent in their effects." When, however, neither use nor disuse appear to operate sufficiently to justify Lamarck's theory, then Mr. Darwin is ready to draw attention to "the most important consideration, that the chief part of the organisation of every being is simply due to *inheritance*;" and so he accounts for the "webbed feet of the upland goose" remaining unchanged, and he curiously describes them as being "rudimentary in function, though not in structure!" (*Origin of Species*, pp. 185, 204, 219). In fact, though Mr. Darwin confesses, that he is "well aware that scarcely a single point is discussed in his volume on which facts cannot be adduced, often apparently leading to conclusions directly opposite to those at which he has arrived" (p. 2); he very ingeniously claims all these conflicting facts as illustrations of one or other of the various theories, old and new, which he has selected to form into one, of a very plastic character indeed, itself a practical specimen of "transmutation from varieties."

if we see no difficulty as to the physical rearing and training of the first human baby which some favoured ape brought forth, we are forced to ask the transmutationists to favour us with some hint of the educational secret by which the monkeys trained and elevated their progeny into men, when we ourselves, alas! are scarcely able, with all our enlightenment and educational strivings, to prevent our masses falling back to a state which is rather akin to that of monkeys and brutes? To explain how man could rise from a monkey will render it comparatively easy to understand how savage man could elevate himself, and become civilised, though at present this is against almost all our experience and knowledge of the various savage races of mankind. The few questionable instances of "beast-children," as they are called, if they prove anything, only prove, that if not rescued from association with beasts, the offspring even of men might soon sink into something scarcely better than brutes.\*

It cannot, of course, be asserted that it would be as difficult to prove that the savage could civilise himself as that the physiological laws admitted by Prof. Huxley might once have been reversed. The latter, we may safely allege, is simply impossible; for nature never contradicts itself. The former, we may admit, is within the range of mere possibility, though, according to all our experience, it must be pronounced to be utterly improbable. Improbable; because, if human knowledge is to be relied upon at all, we must trust to clear deductions from the universal historical experience of mankind, as well as to deductions of science. If the unimprovableness of the Negro renders it doubtful whether he should not even be classed as a different species altogether of the *genus homo* from the European, it is at least highly illogical, at the same time, to be entertaining the idea that the civilised European descended—or, in a more proper sense, ascended—from the Negro!

Now the question naturally arises, Supposing the geological record to be completed, as Mr. Darwin and Sir Charles Lyell assume it may probably be, would this serve, in the least degree, to give support to the thesis they have adopted?

The graduated order of nature is a fact. It is also the very theory of the oldest "tradition" of created existence to which we have been accustomed. And it need not even disturb time-honoured theories or prejudices, if we find that these gradations in nature are even finer than we have heretofore discovered. Even if the distinctive lines between the various higher orders of animated being were proved to be—or rather to have been—as faint as they are between some forms of vegetable and animal life, this would not prove that the one could be produced from or pass into the other. No dead remains of past existences could ever establish such an hypothesis. If ever a law of invariable nature, it would be a law now and always;—or what is a natural law?—and we should not have now to search the geological record in order to establish it, any more than to search the indefinite past to establish the laws of mechanics or chemistry.

\* See *Anthropological Review*, vol. i, p. 21, *et seq.*

But here we are mostly concerned with the development theory with reference to the "primitive man." If we grant, then, that—in the words of Sir Charles Lyell—the absence of gradational forms between the recent and pliocene mammalia should only be regarded as a proof of "the weakness, in the present state of science, of any argument" [against the probable former existence of intermediate forms] "based on such negative evidence, especially in the case of man, since we have not yet searched those pages of the great book of nature, in which alone we have any right to expect to find records of the missing links"; and let it further be supposed that "when the strata of pliocene and post-pliocene date in equatorial regions" are searched, there may actually be "discovered hereafter some species more highly organised than the gorilla and the chimpanzee."\* To complete this hypothetical picture, let us further suppose, in the words of Professor King (who has kindly ventured upon details which Mr. Darwin and Sir Charles Lyell have hesitated to touch), that there may be "no reason to doubt that there may have been species of the *genus* in existence [he is speaking of the *genus homo*] unpossessed of those gifts which so eminently place the existing human races, but in different degrees, above the anthropoid apes: why there may not have been a Pliocene or a Clydian species, possessed of no higher faculties than such as would enable it to erect a protecting shed, fashion a stone for special purposes, or store up food for winter, but, like the gorilla or chimpanzee, be devoid of speech, and equally as unconscious of the existence of a Godhead."†

What, after all, I ask, is gained by these various suppositions towards establishing the theory of transmutation? It is, of course, impossible to deny that there might have been a kind of superior gorilla, less brutal in the development of its back-bone and skull—as the gibbon actually is in these respects; and it is possible there may yet be discovered some forms of crania of less capacity and of inferior type to those of the Australian savage, or of the Neanderthal skull. The approximation of the crania of the apes to man, or of the man to the ape, may even be imagined to be so great, that palæontologists would be puzzled to decide, from the contemplation of the mere *caput mortuum*, whether its living owner had been a monkey or a man. The only result would be, that this point would be determined solely according to the evidence there might be that the individual to which it belonged was probably possessed or not possessed "of those gifts which do place" (it is admitted) "the human race above the anthropoid apes."

I venture to say that questions such as these cannot be decided by any geological record whatever, or any mere dead vestiges of bygone forms of existence. Apart from the physiological objections (which seem to be insuperable,) to the theory of transmutation, the grand issue to be decided by anthropologists will mainly depend upon what we can discover as to whether savage man can civilise himself or not.

\* Lyell, *Antiquity of Man*, pp. 498, 500.

† *Anthropological Review*, vol. i, p. 393.









almost be described as a matter that it has not at all, or scarcely, been thought necessary to investigate, though it must be very important towards attaining a proper knowledge of the periods indicated by the various geological strata and fossil remains. And (again to quote from Sir Charles Lyell), "It is more than probable that the rate of change was once far more active than it is now."\* Although upheavals and depressions of the crust of the earth are now continually recognised as geological facts of the most certain kind, the probable effect of this upon astronomical observations has not, I believe, been ever noticed; though, if well considered, it might probably serve to account for and reconcile certain phenomena very recently admitted by the Astronomer Royal to be in a "*delightful* state of uncertainty."† In Geology, again, it is generally assumed that the order of deposit of fossils must necessarily indicate the order of their creation, which by no means follows; and the absence of remains of any kind in certain strata, has been held generally to prove, not only the non-existence of the undiscovered forms in the particular spots where the investigations may have taken place, but also their non-existence where the strata have not been explored throughout the whole world. The practical effect of such a false system of induction is best witnessed by the remarkable admissions contained in Sir Charles Lyell's recent work. But it must be observed that even if man (as is now at last believed) was contemporaneous with long extinct mammalia, he might have been so, and yet if living only in other regions of the earth, his and their bones might not possibly have been found together. As regards the evidences of the state of man's civilisation from the remains of his handywork, this, too, is, and must always be, but an uncertain means of knowledge. In the ancient canoes, dug up from the banks of the Clyde, Sir Charles Lyell notices the fact, that the iron nails, or bolts, evidently used in their construction, have all wasted away, while the wooden pins remain. But we can easily imagine that man in a primitive state, in a fertile country, and with but few wants not easily satisfied by nature, might be in a high state of moral and intellectual elevation, without having accidentally discovered, or even having required to invent, the difficult processes necessary to obtain metals from the ore, or to forge metallic implements. We have been told—as, indeed, we well know—how his handywork in metals might disappear, while the sharpened flints used for arrows, spears, and probably to be thrown from slings, might permanently endure.

There are one or two minor points which I would, lastly, briefly notice. We have long been accustomed to consider the teeth of man and animals as criteria that indicate the nature of their food. What explanation, then, can be given of the development of the canine teeth of the gorilla or chimpanzee into huge tusks—they not being flesh eating animals—and the non-development of such teeth into tusks in savage man, or even among cannibals? Again, the Hindoos and other races have, for generation after generation, altogether re-

\* *Antiquity of Man*, p. 74.

† *Mon. Notices of Royal Astron. Society* for December 1863; *Astron. Reg.* for January and February, 1864.

frained from eating flesh : Have their teeth become modified in consequence, comparing them with flesh eating races ? If not, why not ? The desiderata on this point are most important, and remain uncollected, though there will probably be little difficulty in filling up the blank.

With regard to adopting the cranium as the test of race, or to determine anthropological questions, much is required to be settled, before this test can be logically applied. For instance, the Negro's cranium has been described as less than the European's, as approaching that of the anthropoid apes, and, at the same time, in general terms, as being "like that of a woman"—meaning a woman of the highest type of mankind. Now, if I mistake not, the European female has even a finer and more elevated form of head than the male, though its capacity is less, as the woman herself is less in bodily size generally. It is evident, then, that the form has nothing to do with the likeness between the flat head of the Negro and the Caucasian female. And, if not, this comparison would surely be better left out ; for it seems to involve a physiological dilemma, when we speak of the Negro, not only as one of a different race, but probably of a different species from the European, and yet make a likeness to the European female one of the marks of difference.

Then, again, as regards the Negro, his extremely curled or woolly hair is spoken of in disparagement, and as a mark of inferiority ; whereas, when the modern American is referred to as physically, at least, degenerating from the European stock whence he sprang, his straight and lank hair is pointed to as a mark of his inferiority, and contrasted with the curly hair of the European. It is to be hoped that, after M. Pruner-Bey's recent microscopical investigations on this subject, the character of the hair may be regarded as one of those varying and accidental features in races from which nothing can be determined, so far, at least, as anthropological problems are concerned.

Variations in the development of the teeth, the shape of the head, the character and colour of the hair, the lobes of the ear, etc., etc., may be observed among the children descended from the same parents on every side among ourselves. A classification of such minute points of difference, as more or less variable or invariable, would be of great value, perhaps, as regards Ethnological science, but would scarcely serve to enlighten us upon the higher problems of Anthropology. These, I imagine, must needs have reference to man's probable origin from one or many Adams, and from a civilised or savage stock. I was surprised to hear it stated that traditional prejudices were sought to be excited against such studies and against this Society. Some people seem to think that, by burying their heads ostrich-like in the sands of existing opinions, they can avoid or prevent the onward and inevitable course of truth, of reason, of knowledge. They pay but a poor tribute to revelation who appear to fear that true science, which gives but the revelation of nature's truth, can ever contradict it. But, in fact, it is not so much revelation they mostly care for, but only their own notions. They should remember, however, that the theories of



tradicted by the physiological laws of hybridity, he regarded as very questionable. The laws of hybridity have not yet been sufficiently investigated to arrive at such a conclusion. It is well known that hybrids have propagated for several generations, and facts do not confirm the supposed law that hybrids cannot reproduce their kind. A breed consisting of three parts of one species and one of another, will, indeed, continue to propagate for several generations. It was not assumed that transmutation of species was effected by sudden changes, but by long continued successive and almost insensible gradations. Mr. Pusey adduced the changes that have taken place within recent years in sheep, so as to produce the varieties of long woolled and short woolled sheep, as illustrative of the changes that may be produced by artificial selection. With regard to the assertion that if the transmutation theory were adopted, all anthropological desiderata would dwindle down to the discovery of a semi-human skull, he considered that even in that case there would remain other important matters for discussion. Whether it was admitted that man was transmuted from an ape, or whether it was agreed that all men were descended from one stock, they might yet inquire whether the differences observed among the races of mankind are specific differences, and whether it be possible to produce a Negro and white man from one another: and whether it be possible to change a Negro into a white man in the course of a number of years, say ten thousand.

Mr. A. R. WALLACE thought that Mr. Pusey had very satisfactorily shown that Mr. Reddie's paper misrepresented the Darwinian theory. If the first step of that theory be admitted—that species may be formed from varieties—it was difficult to see how a line could be drawn between such a change and transmutation. Some of the groups into which the animal kingdom had been divided by naturalists were well marked, and others not so; and of those groups that were well marked, fossil remains have been discovered which indicate an intermediate link. From this it may be inferred that the strongly marked separations we now see, have been only produced by gradual extinction of the intermediate forms during a long geological period. The doctrine of Lamarck was different from the hypothesis of Mr. Darwin, as Mr. Pusey had already shown. It is a well-known law, that animals of the same species vary from several causes; and many peculiarities are continued by hereditary transmission, and in that manner varieties may be formed. The offspring resemble their parents generally, but variations exist between them in every possible characteristic. Indeed, unless it can be shown that the power of effecting changes by natural selection be a myth, it must be admitted that it is capable of producing wonderful changes, in the same manner as it must be admitted that artificial selection produces important changes. With reference to the explanations required by the author of the paper, why the canine teeth of the male gorilla, which does not live upon flesh, should be developed into tusks, Mr. Wallace said, the difference between the gorilla and man in that respect might be easily explained. The gorilla used its tusks as weapons of offence, and those that had

the longest teeth mastered the others, and thus kept possession of the females, while the weaker varieties became extinct. Not a single fact had been adduced by the author of the paper to disprove Mr. Darwin's hypothesis. It has been said that the geological record is imperfect; but he, and those who supported that hypothesis, had the right to assume, that if the record were completed, it would confirm their views, and the very imperfection of the record may be adduced as favourable to that hypothesis. Respecting the assumed laws of hybridity, they were not altogether against it. There was, in fact, almost as much evidence on one side as on the other. With regard to the special question: how the different races of man could have originated? it appeared to him that those who totally object to the arguments of Mr. Darwin, Professor Huxley, and Sir Charles Lyell, should give anthropologists something in return for them; for they cannot be satisfied with mere negation. There were such wonderful analogies to the theory of transmutation in progress in nature, that it was impossible to be satisfied with the declarations of the objectors to the theory, that they did not know how such changes were effected; they ought at least to give a substitute for the theory they attempted to controvert.

Mr. C. S. WAKE was of opinion that they might grant all that Mr. Darwin contended for, without answering the question raised by the paper—the question whether the lower animals are capable of being raised to a state of civilisation? Man possesses something peculiar which qualifies him for civilisation more than the lower animals. They possess instincts, and some of them may be adapted to the habits of man, but they cannot go beyond a certain point. With man, on the contrary, there are no limits to the extent to which he may be civilized. It might be said, indeed, that if man can raise himself from the state of a savage to that of a highly civilised being, that fact would go to prove the Darwinian theory; but supposing man to possess something peculiar in his nature that specially qualifies him for civilisation, the Darwinian theory would receive no confirmation from his power to become civilised.

Mr. CARTER BLAKE said he could not coincide with Mr. Reddie in a great majority of his arguments. The principal object of the paper appeared to be to refute the theory, that man is merely the last link of the chain of being, and which would reduce the study of anthropology to a simple fraction of one common science of organic life. But what could anthropology lead to but to conclusions founded on zoological researches? The objections raised by the author of the paper to the theories supported by Sir Charles Lyell and Professor Huxley, on the ground that they are "new and startling", were considered by Mr. Blake to be of little weight. Anthropologists ought, indeed, to be certain of the fact that the Darwinian theory is truly a working hypothesis before they could speculate from it on the genesis of man. Mr. Blake was not a Darwinian in the correct sense of the word. He did not think, however, that Mr. Darwin intended to insinuate that animal life was originally derived from vegetable life, and that they belonged to the same type of creation. No such biolo-



gical solecism would have been entertained by him. It was asserted by Mr. Reddie, that the Darwinian theory was not supported, and was even opposed, by palæontological evidence; but he (Mr. Blake) thought that it received considerable support from palæontology, for it bound together a number of palæontological facts which were otherwise inexplicable; such, for example, as the partially developed rudimentary organs which several species possessed. The hypothesis of the operation of some orderly system of transmutation was the most probable explanation of those undeveloped organs, and was most consistent with observed facts. The doctrine of transmutation, he conceived, had little bearing on the opposing theories of the unity or diversity of the many varieties of man, and he objected to having the polygenists and transmutationists confounded together. The "graduated order of nature" was admitted to be a fact by Mr. Reddie. But what was that "graduated order of nature"? What was it but a succession of different types? The questions then arose: how did those types originate? And if they were the result of established laws, how could such laws be opposed to any physiological facts? The Neanderthal skull, he thought, threw very little light on the question, and he should make a communication to the Society on that subject on a subsequent evening. Allusion was made in the paper to the discovery, on the banks of the Mississippi, of the remains of a nation more civilised than the Red Indians, but though those relics of a former race were of great antiquity, they were modern in the sense in which geologists apply the word, probably quite modern as compared with the history of mankind. He protested against the manner in which the author of the paper had spoken of geological evidence. He did not know that any geologists had used such arguments as those ascribed to them, and if they ever did so, at least, such opinions were not entertained at the present day. As to the hypothesis that the sharpened flints found in the drift were thrown from slings, such a hypothesis did not account for them, except it were supposed that in various localities battles must have been fought; such an improbable theory must remain unaccepted. With regard to the resemblance of the Negro cranium to that of European women, Mr. Reddie must have mistaken what was said in the paper to which he alluded. There was no stress laid on the peculiarities of form, but merely on the size of the skulls. The shape of the two crania differed very considerably, and there was no danger of any person at all acquainted with the subject mistaking a true West African Negro cranium for that of an European, whether male or female. The woolly hair of the Negro had been referred to, not as a mark of inferiority, but only as a specific difference. In the able article written by Dr. Pruner-Bey, inserted in the last number of the *Anthropological Review*, he considered the hair an essential character of race. Mr. Reddie had referred to the oldest book in the world as giving the anthropological description of man's origin; but there was historical evidence in the Nabathæan records on that subject, hinting at the tradition that human beings existed long before Adam. It was curious to observe how old traditions and exploded opinions were in the course of years revived and brought forward as new subjects for speculation.

There was, for example, an old book about our parents in Paradise, in which the author speculated at great length on the question whether Adam and Eve had umbilical cords, and the same speculation was revived a few years since in a book written by Mr. Gosse.

Mr. BENDYSHE could not perceive how the transmutation theory could get rid of the polygenous theory. Mr. Reddie appeared to suppose that, admitting the transmutation theory, man must have descended from a single ape; but that by no means followed. Man might have descended from several different apes. The question of the origin of man from one or from many Adams, was not settled at all by the transmutation theory. The opinion expressed by the author of the paper, that "nothing that can possibly ever be supplied in fact or reasoning will enable rational man to come to any other conclusion than that man's origin must have been miraculous," appeared to be strangely inconsistent with the assertion, in another part of the paper, that anthropology claims to be established as a natural and inductive science.

Mr. REDDIE explained that induction might lead us to believe in a miraculous theory as the only explanation of existing facts, when natural laws would not account for them; but it could never justify our believing in a *natural* reversal of the laws of nature.

Mr. BENDYSHE continued. He conceived that anything miraculous must be produced by a reversal of the laws of nature. On the question of man's origin, it appeared to him that those who talked about the origin of man being miraculous, did not assist at all in solving the mystery. Suppose, for instance, that the original man appeared suddenly on the earth: we should say that such a sudden appearance must have been miraculous; but, if that phenomenon were repeated, and occurred at certain periods, then, indeed, it would become a law of nature. The supposition, that the origin of man was miraculous, would afford no explanation of the fact, which would be as difficult to imagine as ever. It would surely be better to use the word "inconceivable."

Mr. PUSEY added a few remarks, in reference to the observations in the paper, on the development of canine teeth in the Hindoos. He said that the Hindoos do eat the flesh that has been offered in sacrifices.

Mr. G. E. ROBERTS made some observations in reference to the alleged imperfection of the geological record. He thought it was so imperfect, that there was little reliance to be placed on the evidence to be drawn from it, either on one side or the other. He felt sure, indeed, that the state of palæontological knowledge was such, that it was not possible to draw any conclusions on a great scale from the discoveries that have been made. The rapidity of the change of opinion respecting the organic remains found in the succession of rocks was so great, that it showed no dependence could be placed on such conclusions. He agreed with Mr. Wallace and with Mr. Blake, in thinking that the author of the paper had not fully comprehended the theory of Mr. Darwin; but the subject was so comprehensive, that it was difficult to arrive at definite conclusions respecting it. In confir-

mation of the remarks of Mr. Blake, about the recurrence of speculative opinions in cycles at different times, he mentioned that he had lately seen a pamphlet in which the occurrence of flint implements on the earth was attributed to the agency of fallen angels, and the same opinion he had seen expressed in an old geological work.

The PRESIDENT thought the meeting were much indebted to Mr. Reddie for having elicited the interesting discussion that had taken place, and for endeavouring to show the desiderata which anthropology now requires. He did not wish to say much on that occasion respecting the origin of man, and though he did not agree with Mr. Reddie in his conclusions, he thought anthropologists should feel obliged to him for putting the drag to the coach, which he might think was going too fast down the hill. Mr. Reddie considered that some anthropologists were too hasty in their generalisations; but it appeared that he himself was liable to the same imputation, when he asserted that no rational man could come to any other conclusion than that man's origin must have been miraculous. Mr. Reddie said that, according to the transmutation theory, the ape was assigned to man for an ancestor, mediately through the Negro, and that such a supposition was not to be tolerated as a working hypothesis; but it might be asked, is the supposition of special creation and miraculous creation a good working hypothesis? It should be borne in mind that the historical period is comparatively very short indeed, and it would be a wonder if in that space of time anything should be discovered to confirm the theory of transmutation. It was an important question bearing on the subject, whether it is possible to civilise savage races; for if that were impossible it would throw a doubt on the possibility of transmutation. This was the most forcible argument Mr. Reddie had adduced. The historical period was, however, too short to enable anthropologists to draw any definite conclusions as to what might be done in the course of a much longer series of generations by the selection of species, and by other causes. With regard to the resemblance of the European female brain to that of the Negro, all observers agreed that there was a resemblance, and that the brain of the female Negro, so far as the mere capacity went, resembled more nearly that of the ape—the cerebral capacity of the female being the smaller in all cases. Such were the facts; let the conclusions drawn from them be what they might. With respect to the woolly hair of the Negro, it was not said that that indicated inferiority of race, it was merely noticed as a distinction. Mr. Reddie asserted that no rational man could come to any other conclusion than that man's origin was miraculous; but it did not appear to him (the President) that any rational man would arrive at that conclusion. There was, in point of fact, nothing irrational in the theory of transmutation. There was a grand idea in it. It conceived the gradual working out of a grand design or the operation of a few fixed laws, and it ought to inspire us with grander feelings with regard to the phenomena of animated nature than would the idea of continual supernatural interference with physical laws. There was no necessity for the assumption of miraculous interposition, which supposition he conceived to be most unscientific and irrational.



of the large quantities of them generally found together, and because the ordinary, and what might be called the stereotyped, explanation of this circumstance was so lame. It was usually said that these quantities were probably found where there had been "flint manufactories"; forgetting that the idea of a manufactory implies a knowledge of the division of labour in a community, and is almost absurd as applied to the uncivilised and savage races of mankind. With respect to the inhabitants of Cashmere, it may be observed that they are Mohammedans; so that they and the Sikhs have this in common, that they are both rigid Theists, and adverse to all idolatry.\* In conclusion, he observed that nothing had been urged in the course of the discussion that was materially against the arguments he had advanced, or which seemed to require further reply.

The meeting then adjourned.

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ORDINARY MEETING.—FEB. 16, 1864.

SIR CHARLES NICHOLSON, BART., V.P., IN THE CHAIR.

The minutes of the last meeting were read and confirmed.

The secretary read a list of the presents received by the Society since the last meeting, and thanks were voted for the same to George Witt, Esq., and to M. Morlot.

The names of the following new members were announced:—Arthur W. à Beckett, Esq.; Rev. P. A. Newnham; Franklin Richards, Esq.; Alexander Michie, Esq.

The following paper was then read:—

*On some Pre-historic Dwellings in Ross-shire. Extracted from Letters received by Mr. GEORGE E. ROBERTS from the Rev. J. M. JOASS, M.A. With an Introduction by GEORGE E. ROBERTS, F.A.S.L.*

THE existence of many curious stone-encircled dwelling-spots of pre-historic age in Ross-shire has long been known, but I do not think any archæologist has taken them definitely in hand, and certainly no anthropologist has endeavoured to connect them with a particular ancient people. In form these "lodges," as we may almost call them, are flat spaces chosen out of the moorland, generally along a line of terrace, or upon a rising elevation, and marked out as a habitation by being girt about with a single line of whatever large stones, or rock-fragments, the neighbourhood furnished. Generally, their

\* In Mr. Winwood Reade's interesting work on *Savage Africa*, it will also be found, that even some of the Negro tribes are now being visibly improved through the same influence of Mohammedanism. This, Mr. Reade attributes mainly to the pure Theism of that religion, its severity against all idol-worship, and the discipline of its fasts and other rigid rules; as well as partly to its social influences—the Negroes being made converts, and then treated more as servants and "brethren" than mere slaves. We ought to learn some important lessons from these facts on both sides of the Atlantic. J. R.